

GSNZ SPV1 Ltd
Ahuroa B Gas Storage Facility
Monitoring Programme
Annual Report
2018-2019

Technical Report 2019-93

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Executive summary

In October 2018, Contact Energy Ltd sold Ahuroa-B Gas Storage Facility to Gas Services New Zealand (GSNZ SPV1) Ltd (the Company).

Ahuroa-B is located on the corner of Barleymans Road and Croydon Road, east of Midhirst, in the Waitara catchment. Ahuroa-B is a natural gas storage facility for Contact Energy's Stratford Power Station.

This report for the period July 2018 to June 2019 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess Ahuroa-B'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.

The Company now holds 12 resource consents, with requirements that they must satisfy. The Company holds two consents to discharge effluent /stormwater into unnamed Makara Stream tributaries, two consents to discharge emissions into the air, three consents to discharge natural gas, stormwater and drilling waste into/onto land, and three consents to use land for installation of pipes and culvert framework. In addition, two consents are held for landuse associated with the pipeline route to their nearest customer.

During the monitoring period, the Company demonstrated an overall high level of environmental performance.

The Council's monitoring programme for the year under review included two inspections, and two water sample collections for chemical analysis. Data on gas injection, well pressure data and flaring volumes were provided by the Company to the Council monthly and an annual report was also provided.

Monitoring of the stormwater indicated compliance with consent derived conditions. Inspections found that the site appeared well managed and secure, with good housekeeping prevalent across the site.

Review of the monthly reports indicated that Ahuroa-B was compliant with consent limits and conditions for regular reporting. The monthly reports indicated that there was no issues during flaring, except in March 2019, where additional flare flow was released due to the shutdown of the site for the expansion project phase 3 tie-ins. There were also no exceedances in down-hole and top-hole pressure in the reservoirs.

During the year Ahuroa-B Gas storage facility demonstrated a high level of environmental and administrative performance with respect to the resource consents held by the Company.

There were no unauthorised incidents recording non-compliance in respect of this consent holder during the period under review.

There was also ongoing consultation between the Council and the Company to liaise around matters of interest throughout the monitoring period.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% 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 2019-2020 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

This report is for the period July 2018 to June 2019 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by the Company (GSNZ SPV1 Ltd) for Ahuroa-B Gas Storage Facility (AGS). The Company operate the Ahuroa-B wellsite, located on the corner of Barleymans Road and Croydon Road, east of Midhirst, in the Waitara catchment. Ahuroa-B is used as a natural gas storage facility for Contact Energy's Stratford Power Station.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to abstractions and discharges of water within the Waitara catchment, and the air discharge permit held by the Company to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective.

Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Company's use of water, land and air, and is the first annual report by the Council for the Company, since the transfer from Contact Energy Ltd.

1.2 Structure of this report

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

- Consent compliance monitoring under the RMA and the Council's obligations;
- The Council's approach to monitoring sites through annual programmes;
- The resource consents held by the Company in the Waitara catchment;
- The nature of the monitoring programme in place for the period under review; and
- A description of the activities and operations conducted in the Company site/catchment.

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 2019-2020 monitoring year.

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

1.3 The Resource Management Act 1991 and monitoring

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

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

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

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

1.4 Evaluation of environmental and administrative performance

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 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

1.5 Process description

The Company holds resource consents to store natural gas in a depleted hydrocarbon reservoir in the Tariki formation, using injection and extraction facilities located at the Ahuroa-B wellsite east of Midhirst (shown in Photos 1-3). Ahuroa-B wellsite was established by the Petroleum Corporation of New Zealand Ltd (Petrocorp) in 1986, following which four production wells were drilled by Petrocorp, Fletcher Challenge Energy New Zealand Ltd and Swift Energy New Zealand Ltd. From 2008, Contact Energy (under operatorship of Origin Energy Ltd) began to develop the Ahuroa-B underground gas storage (AGS) project.

Storage involves the injection of gas into a depleted sub-surface reservoir. Natural gas is typically injected during periods when the demand for gas supply is relatively low (e.g. in the summer months). And when demand for gas supply increases, the injected gas is withdrawn from the storage reservoir.



Photo 1 Ahuroa-B site layout facing North West, May 2014

1.5.1 Geological setting

At Ahuroa, gas is injected, using cased wells at a depth of approximately 2,300 m, into the reservoir sandstone, known as the Tariki Sandstone Member. This member consists of interbedded sandstone, siltstone and mudstone deposited as submarine fans during the Oligocene. (~30 million years ago) as part of the Otaraoa Formation. Periods of tectonic activity during the Oligocene and Early Miocene (~20 million years ago) subsequently modified the structural geology of the region, particularly in relation to tectonic stresses acting upon the Taranaki Fault and Tarata Thrust Fault. The Tarata Thrust Fault is adjacent to the Ahuroa complex/system and aids in the effective trapping and storage of gas, in addition to the amalgamated sandstone deposits in the Tariki Sandstone Member which provide good reservoir quality and are overlain by alternating intervals of thin and thick siltstones, predominantly the Otaraoa formation, which form a continuous top-seal.

The potential environmental risk associated with this gas storage activity relates to the possible unintentional release of natural gas into the receiving environment, particularly into groundwater aquifers. Appropriate reservoir selection and continual pressure monitoring are integral safeguards implemented to mitigate against this risk.

The nearest potable water aquifer to the reservoir is in the Matemateaonga Formation, the base of which is located approximately 950 m below ground level, some 1,300 m above the storage reservoir. There are also at least three known hydrocarbon reservoirs in the overlying formations, meaning that, in the highly unlikely event of any gas losses, any potential upward migration of gas would likely be intercepted by these impermeable reservoirs on the way toward the surface.

1.5.2 Gas injection/extraction

At the Ahuroa-B site, the gas storage project had been developed in two stages. The initial storage utilised the existing Ahuroa 2A production well (identified in Photo 2) to inject gas. The secondary stage involved

the drilling of an additional three injection wells (Ahuroa 3, 4 and 5ST-1, Photo 2), and the installation of additional compressors and surface processing equipment.

The site is configured so that the gas can run either through New Zealand Energy Corporation Ltd's (NZEC's) Waihapa production station (WPS) and then to Ahuroa through the original 8-inch gas line, or through the new 18-inch gas line from the Company transmission system via Contact Energy's Stratford Power Station. The system can be configured to either inject or extract through one or more injection wells at any time using the same surface equipment, but cannot extract through one well and inject through another simultaneously.

During injection, gas comes in through either the Waihapa or Contact Energy pipeline and into the compressor. The compressor raises the pressure to well and the reservoir pressure to make injection into the reservoir possible.

Extraction is a similar process to natural gas production. During extraction, relatively small quantities of produced water and gas condensate are brought to surface with the gas. These are separated out in the facilities on site. The produced water is piped to a 63 cubic metre storage tank on site, before being transported by road tanker to Waihapa production station for disposal by deep-well injection. The condensate is separated and piped directly to Waihapa. No condensate is stored on site.

Continual pressure monitoring is conducted using pressure sensors at surface and down-hole locations on the Ahuroa 3, 4 and 5ST-1 wells.



Photo 2 Ahuroa-B wellsite and gas storage facilities

1.5.3 Pressure monitoring

Pressure data is essential in understanding reservoir behaviour and response to injection and extraction, and in ensuring reservoir and pipeline integrity. Temperature and pressure data are monitored by operators at the Waihapa production station control room. High and low alarms are set on all the pressure transmitters to ensure any potential irregularities are quickly detected by site operators.

Both the pipeline and the reservoir pressure alarms are significantly lower than the design pressure (of the pipeline) or the known safe pressure (for the reservoir).

Hydraulic control valves are installed which can be used to shut the wells in, either remotely, or automatically, as required should there be a pressure anomaly during injection or extraction. In an extreme emergency, if none of the control valves are working, there is a subsurface safety valve on each well which will automatically close if the well is exposed to atmospheric pressures.

1.5.4 Pipeline to Stratford Power Station

An 18-inch pipeline, 8.5 km in length, was installed between AGS and SPS in 2013 for the bidirectional conveyance of gas associated with the AGS project. A fibre optic cable was installed in the same trench. The pipeline route crosses 14 waterways, comprising the Kahouri and Piakau Streams and unnamed tributaries of the Kahouri (2) and Piakau (4) Streams in the Patea catchment, and unnamed tributaries of the Makara (5) and Ahuroa (1) Streams in the Waitara catchment. The pipeline route is shown in Photo 3 below.

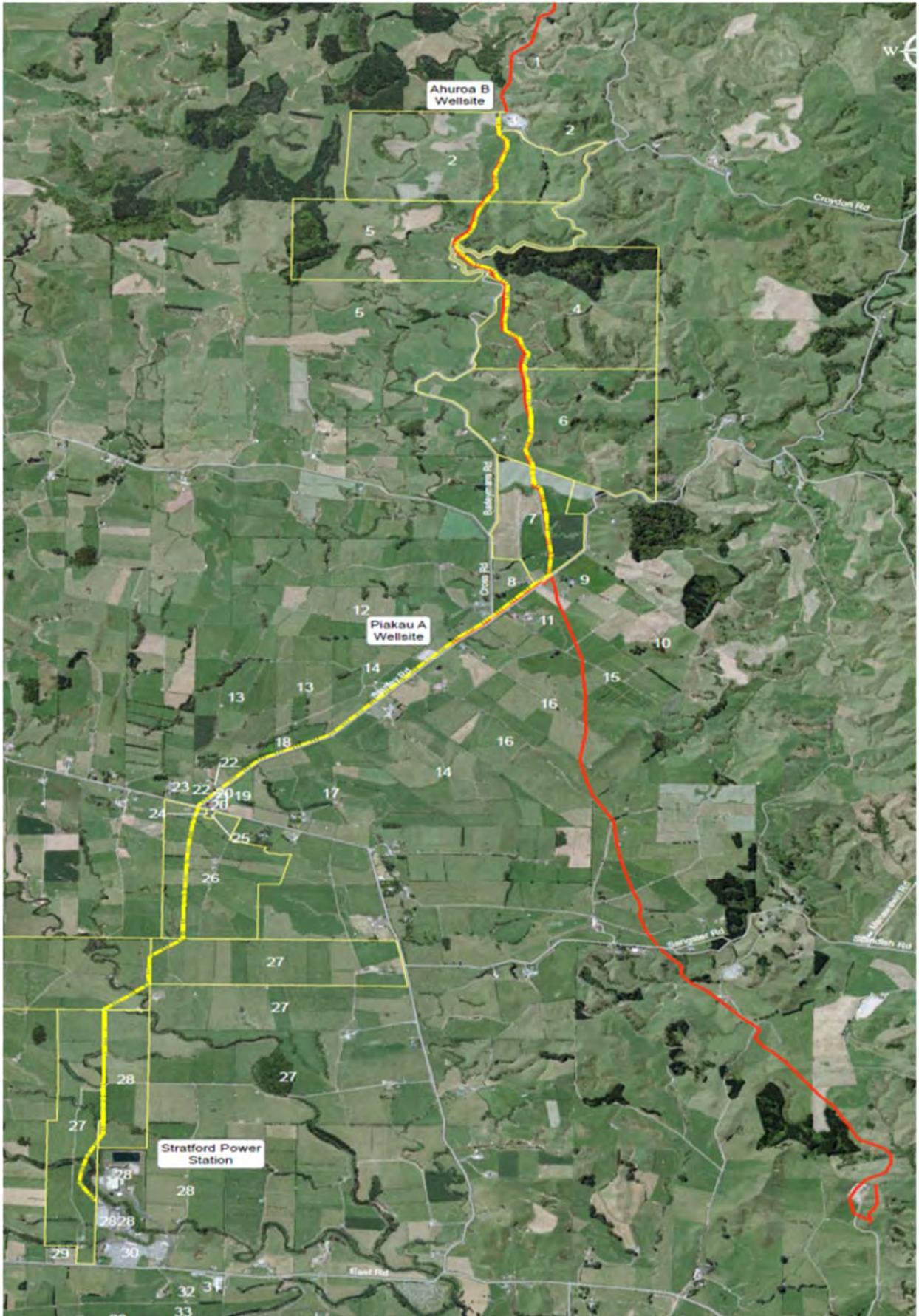


Photo 3 Pipeline route from Ahuroa-B Gas storage to Stratford Power Station

1.6 Resource consents

A summary of the consents held by the Company in relation to Ahuroa-B Gas Storage facility and the gas pipeline connecting it to Stratford Power Station is given in the following Tables 1 and 2 respectively. A copy of each of the consents for the storage and pipeline can be found in Appendix I and Appendix II, respectively.

Table 1 Summary of resource consents held by the Company for Ahuroa-B gas storage facility

Consent number	Purpose	Consent Granted/ Commencement Date	Change in Conditions Date	Next review date	Expiry date
<i>Discharge to Air Permits</i>					
7745-1*	Discharge emissions to air from flaring of hydrocarbons associated with well clean-up and well testing associated with exploration activities at Ahuroa-B wellsite	Oct 2009	-	2022	2028
7746-1	Discharge emission to air during flaring from well workovers and in emergency situations associated with production activities at Ahuroa-B wellsite, together with miscellaneous emissions	Oct 2009	-	2022	2028
<i>Discharge to Water Permits</i>					
3681-2	Discharge stormwater, site water and uncontaminated production water to land and Makuri Stream tributary in the Waitara catchment	Jan 2011	-	2021	2033
7621-1*	Discharge stormwater and sediment from Ahuroa-B site development (wellsite) earthworks to two unnamed Makara Stream tributaries	Apr 2010	-	2021	2027
<i>Discharge to Land Permits</i>					
7432-1	Discharge natural gas into land for purpose of gas storage	Apr 2011	-	2021	2027
5173-2*	Discharge solid drilling waste from hydrocarbon exploration operations at Ahuroa-B wellsite by mix-bury-covers	Jul 2003	-	-	2021
7748-1*	Discharge stormwater and sediment into/onto land from earthworks during extension of Ahuroa-B wellsite	Jan 2011	-	2021	2027
<i>Land Use Permits</i>					
7622-1*	Install, use and maintain a culvert in unnamed Makara Stream tributary	Apr 2010	-	2021	2027
7749-1*	Install pipe in bed of unnamed Makara Stream tributary	Jan 2011	-	2021	2027
7750-1.1*	Install and use a culvert in unnamed Makara Stream tributary	Mar 2016	-	2021	2027

Table 2 Summary of resource consents for the pipeline from AGS to SPS

Consent number	Purpose	Consent Granted/ Commencement Date	Change in Conditions Date	Next review date	Expiry date
<i>Land Use Permits</i>					
9309-1 to 9322-1*	Install and use pipeline for conveying gaseous hydrocarbons under various streams between Ahuroa-B wellsite and SPS	Aug 2012	-	2022	2028
9576-1*	Install and use a culvert in an unnamed Makara Stream tributary for associated realignment	Jun 2013	-	2021	2027

*Consents not actively exercised during the 2018-2019 monitoring period

Consents 3681-2 and 5173-2 were granted in 2003 to replace consents that provided for hydrocarbon exploration and production operations at Ahuroa-B wellsite. Consent 7432-1 was granted in December 2008 to provide for conversion of the depleted Ahuroa reservoir to a gas storage facility, and consents 7621-1 and 7622-1 enabled development of the site. Consents 7745-1 and 7746-1 were issued as a partial transfer to Contact Energy of consents that had allowed discharges to air at a number of sites. Consents 7748-1 to 7750-1.1 were granted in January 2011 to provide for expansion of the site. An extension to the lapse period of 7750-1.1 was granted on 16th March 2016. This enables the Company to exercise the consent (i.e. build the proposed culvert) at any time up until 1 June 2027.

Consents 9309-1 to 9322-1 were granted in March 2012 to provide for the construction and operation of a gas pipeline between AGS and SPS. Consent 9576-1 was granted in June 2013 to allow access for pipeline testing and maintenance.

Of these 12 consents, as listed in Table 1 and Table 2, four of those held in relation to AGS were actively exercised in the 2018-2019 review. The pipeline was constructed during 2013, so although the pipeline consents have been exercised they were not actively used during the period under review.

1.7 Monitoring programme

1.7.1 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 Ahuroa-B site and pipeline consisted of four primary components.

1.7.2 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.

1.7.3 Site inspections

The Ahuroa-B site was visited twice during the 2018-2019 monitoring period.

Inspection 1: 2nd July 2018

Inspection 2: 31st May 2019

Inspections focused on flaring activities and potential water discharge points including surface drainage networks and skimmer ponds. General site housekeeping was also assessed, and the neighbourhood was surveyed for environmental effects.

1.7.4 Chemical sampling

The Council undertook sampling of the skimmer pit discharge site twice during the review period. The collected samples were analysed for hydrocarbons, chloride, pH, conductivity, and suspended solids.

During this monitoring period Contact Energy and the Company also undertook regular sampling of this discharge to ascertain if it was within the consented concentrations to discharge.

1.7.5 Data review

The Company is required to provide reservoir pressure and gas injection data routinely for Council review. Special conditions 3 and 4 of Consent 7432-1 stipulate the maximum allowable reservoir pressure, and require the Company to record injection pressures and relate this to maximum reservoir pressure. A summary of flaring data is required annually by special condition 18 of consent 7746-1. Contact Energy provided information through to 1 November 2018, whilst for the remainder of the monitoring period the information was provided by the Company.

2 Results

2.1 Water

2.1.1 Inspections

During this monitoring period, two inspections were conducted. Both inspections found that Ahuroa-B Gas Storage Facility was compliant with all consent conditions.

2nd July 2018

During the inspection routine monitoring was undertaken and a stormwater discharge sample of the site was collected, as per the monitoring programme. The skimmer pit discharge was very clear and did not give rise to any immediate concern. All stormwater from the site was being directed through the north-west skimmer pit for treatment prior to discharging into the adjacent unnamed tributary of the Makara Stream.

The ring drains and bunds were all secure, and there was no flaring onsite during the inspection. There was a maintenance crew onsite. No silt or other visual contaminants were noticed in and about the site.

31st May 2019

A compliance monitoring inspection was carried out at Ahuroa-B well site to check for compliance with resource consent conditions. Samples were collected at the time of inspection and the results of those samples were found to be compliant with consent conditions.

2.1.2 Results of discharge monitoring

A sample of the skimmer pit discharge was collected on one occasion during this monitoring period. The sample was collected from monitoring location IND001046 (Photo 4). The results of the monitoring are provided in Table 3 below.



Photo 4 Ahuroa-B site looking towards the skimmer pit (left) and the final discharge point

Table 3 Ahuroa-B skimmer pit sampling 2018-2019

AGS IND	Parameter	Total Hydrocarbons (C7-C36)	Chloride	Electrical Conductivity	pH	Sample Temperature	Suspended Solids	Turbidity
Site	Date Collected	g/m ³	g/m ³	mS/m @20°C	pH Units	°C	g/m ³	NTU
IND001046	02 Jul 2018	<4	3.5	4.4	7.5	13.6	<3	NR
IND001046	31 May 2019	NR	6.5	6.8	7	13.1	70	44
Number of Samples		10	10	10	10	-	9	3
Min		<0.5	3.4	3.1	6.6	-	<2	1.1
Max		<0.5	15	30.9	7.2	-	43	1.4
Mean		0.2	7.91	10.7	6.9	-	8	1.3
Consent limit 3681-2		15	50	-	6.5-8.5	-	100	-

The results of the skimmer pit sampling is provided in the above Table 3. Note the statistics for this monitoring location since April 2011 are also provided.

The sample results on both occasions indicate compliance with consent 3681-2, condition 8, as defined in Table 3 for the target analytes of chloride, total petroleum hydrocarbons, pH and suspended solids.

2.2 Air

2.2.1 Review of flaring data

As expressed in consent 7746-1, special condition 18, the Company must monitor and log all monthly flaring totals. The Company recorded this data and provided the Council with monthly updates pertaining to flaring. In the 2018-2019 monitoring period the estimated total annual gas flared was 51,084 Sm³. Figure 1 below details the monthly flaring totals for this monitoring period (1st July 2018-30th June 2019). The largest period of flaring occurred in March 2019, when the monthly total was 11,742 Sm³. This additional flaring was explained to the Council as the result of a shutdown of the site, which allowed for expansion project phase 3 tie-ins.

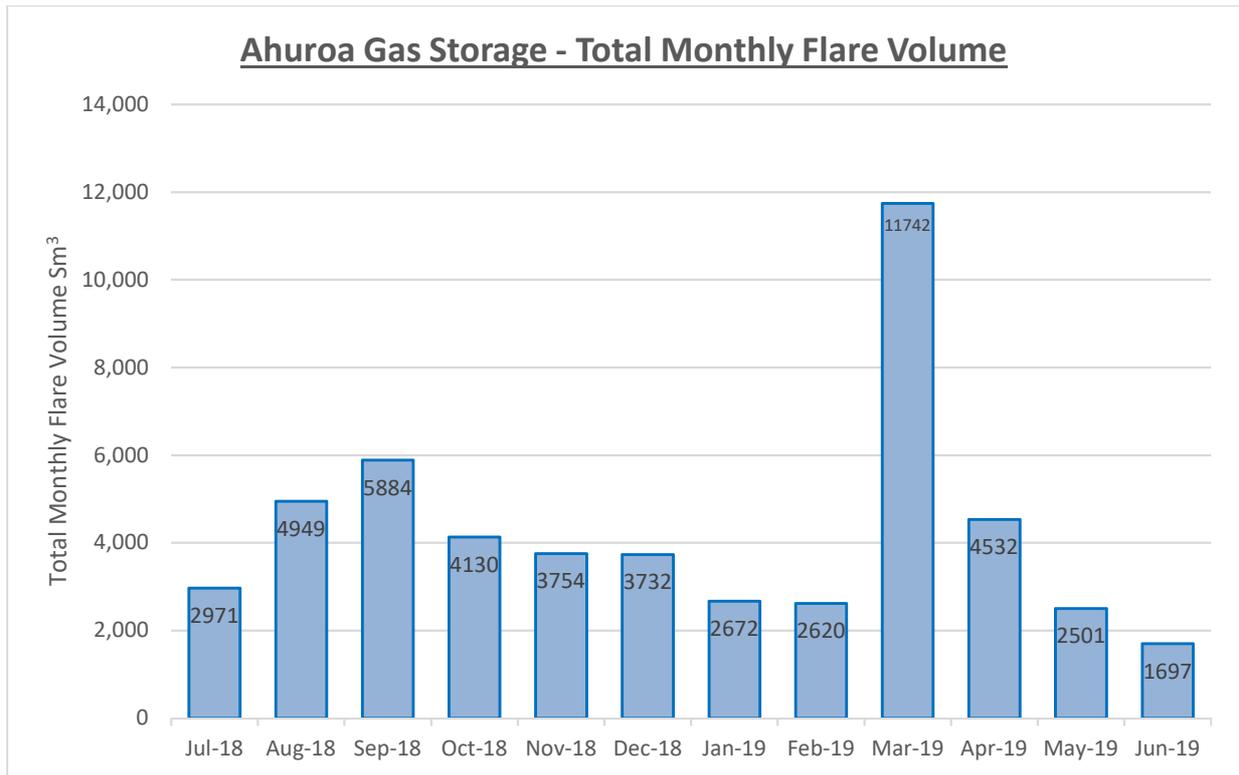


Figure 1 Ahuroa-B Gas storage facility flaring volumes by month (Sm³) Jul 2018-Jun 2019

2.2.2 Reservoir pressure and injection pressure data review

Consent 7432-1 stipulates a maximum reservoir pressure of 3,400 psi. There is also a requirement for the consent holder to record injection pressures and relate these data to the maximum reservoir pressures.

The data supplied to the Council are hourly reservoir pressure values from down-hole pressure gauges in the Ahuroa 3, 4, and 5ST-1 wells, and hourly injection pressure values from surface gauges on the Ahuroa 2A, 3, 4 and 5ST-1 wells. Figures 2 and Figure 3 show monthly maximum readings for the down-hole and top-hole pressure gauges, respectively.

Both down-hole and top-hole pressure monitoring data (Figures 2 & 3) indicate compliance with the pressure limit of 3,400 psi in special condition 3 of consent 7432-1 for the entire monitoring period.

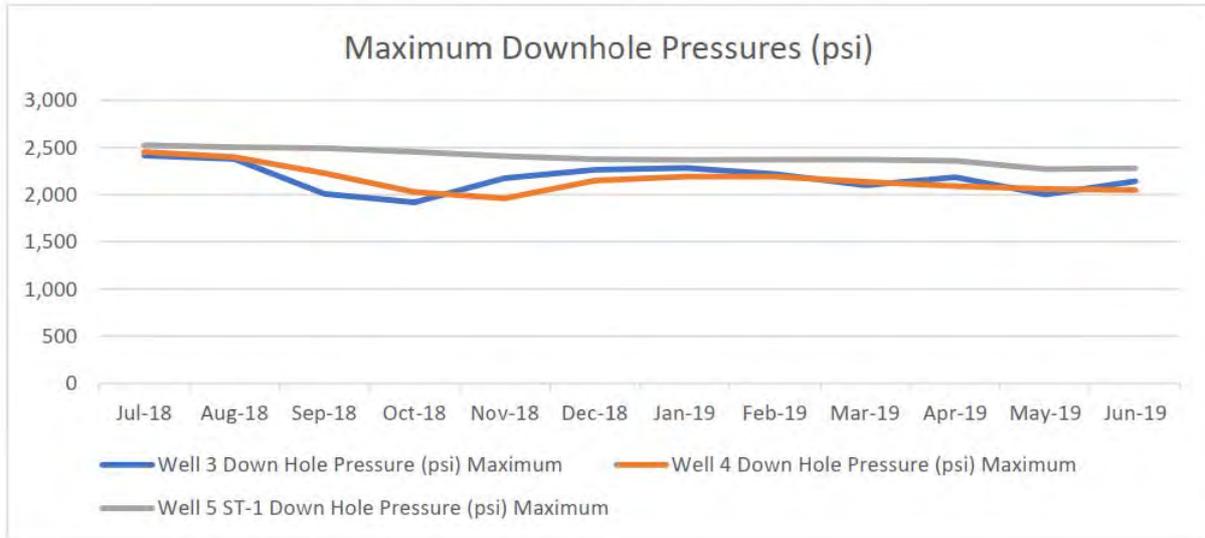


Figure 2 Monthly down-hole pressure for Ahuroa-B gas wells 3, 4 and 5ST-1, Jul 2018-Jun 2019

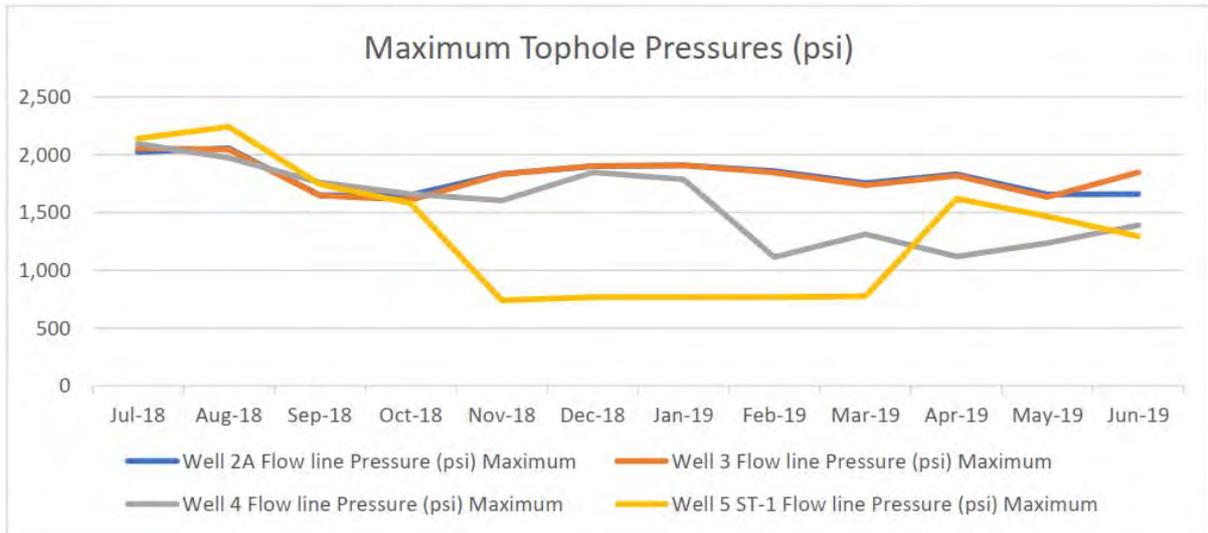


Figure 3 Monthly top-hole pressures for Ahuroa-B gas wells 2A, 3, 4, and 5ST-1, Jul 2018-Jun 2019

2.3 Pipeline

The gas pipeline between AGS and SPS was constructed and commissioned between January and October 2013. Various silt retention measures, including hay bales, silt cloth, fluming, bunds and rip-rap, were used along the pipeline, and revegetation with grass and by riparian planting took place when soil moisture levels became suitable.

No significant effect on waterways was found during the construction, or since.

2.4 Annual flaring report by the Company for AGS

Under condition 19 on consent 7746-1 to discharge emissions to air, the Company is required to provide to the Council during May each year a report:

- Detailing any energy efficiency measures implemented on the site;
- Detailing smoke emissions as required under conditions 17;

- Detailing any measures undertaken or proposed to reduced smoke emissions;
- Detailing any measures undertaken or proposed to reduce flaring;
- Addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
- 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.

This condition was imposed in relation to flaring from well workovers and emergency situations, and miscellaneous emissions, associated with a hydrocarbon production wellsite. Since 2010, the consent has provided for the operation of an underground gas storage facility with relatively small amounts of emissions.

The required report for the AGS site was received in July 2019, slightly later than required. A summation by the Company is provided below in relation to the points defined by condition 19 of consent 7746-1. The report is attached as Appendix III.

Energy efficiency measures:

No additional efficiency measures have been implemented at Ahuroa Gas Storage during the current reporting period.

Flexgas has been working to minimise process upsets that lead to plant trips and flaring events as ongoing improvement to the plant operations. The Company have been making small improvements in the plant operations to reduce the number of plant trips and hence flaring events.

Flaring and flare emissions

Flaring at the Ahuroa Gas Storage facility is a primary safety mechanism to dispose of gas from process upsets, plant shutdowns and start-ups, well testing and pipeline depressurisation by converting to products of combustion rather than flaring unburnt hydrocarbon gas. Flaring is only undertaken as absolutely necessary due to the economic cost of flaring stored gas.

A pilot flare is maintained at all times to ensure that there is a source of ignition for flared gas to ensure safe ignition, meaning there is a small continual amount of gas continually being flared.

The flare installed at Ahuroa was designed by the original equipment manufacturer John Zink to have a high combustion efficiency, smokeless operation and reduced air emissions. Contact conduct regular maintenance on the flare system to ensure the flare continues to operate as per design. These include:

- Two yearly checks of the pressure equipment. The last round of maintenance inspections was undertaken in 2018.
- Annual visual inspections of vegetation to minimise fire risks
- Regular ad-hoc maintenance to ensure the flare continues to operate as per design

Annual flaring volumes since 2014-2015, provided for the AGS Facility, are presented in Figure 4 below.

Smoke emissions

There have been no visible smoke emissions at Ahuroa as a result of exercising consent 7746-1 during the current reporting period.

Complaints Received relating to Ahuroa Gas Storage

No complaints were received as a result of any flaring events or smoke emissions at Ahuroa during the current reporting period.

Technological advances relevant to discharges to air

Technological advances to plant such as Ahuroa-B Gas Storage to reduce current discharges to air are limited given the intermittent nature of the facility and the flaring events.

Potential exists to recover gas sent to flare and re-use within the plant with the addition of Flare Gas Recovery Units. However, given the intermittent nature of operation of Ahuroa the flaring events are as a result of plant trips or process upsets which does not allow for the collection and re-use of the flare gases in part of the plant using gas. Therefore, these measures have not been pursued further

Flexgas is currently in the process of expanding the daily injection and extraction capability of Ahuroa, in which the starting system on the existing injection compressor is being upgraded from a gas starting system to an air start system.

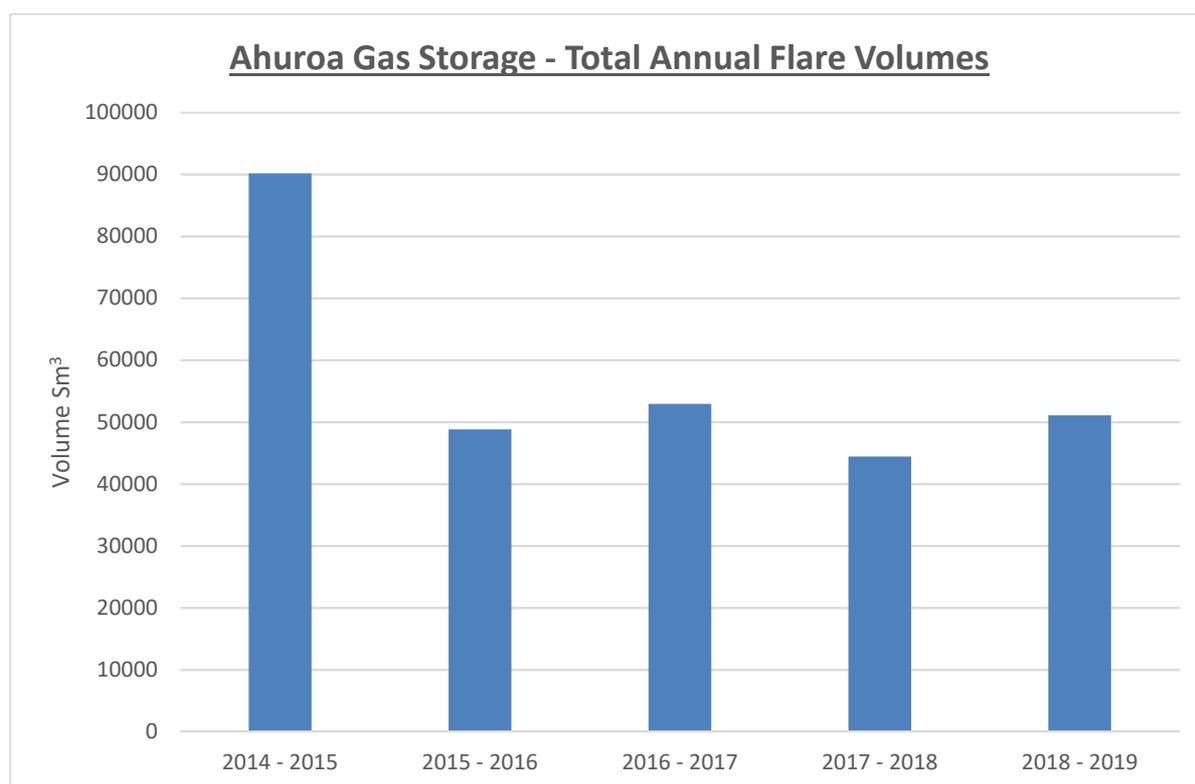


Figure 4 Annual flaring volumes for AGS over time since 2014-2015

2.5 Investigations, interventions, and incidents

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 the Company. 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.

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register includes events where the Company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

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 company is indeed the source of the incident (or that the allegation cannot be proven).

During the 2018-2019 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Contact Energy's and First Gas's conditions in resource consents or provisions in Regional Plans in relation to Ahuroa-B Gas storage facility and the connecting pipeline to Stratford Power Station.

3 Discussion

3.1 Discussion of site performance

The Company performed well in respect of consent compliance in the 2018-2019 monitoring period. Ahuroa-B staff were found to be co-operative in all interactions with the Council during this period. It is noted that this is the first monitoring report with respect to the new operator GSNZ SPV1 Ltd managing this asset.

Inspections noted that silt control was undertaken to a high standard with the visual check of the discharge indicating minimal suspended solids or turbidity. This was further assessed during the chemical sampling exercise. The associated skimmer pits, ring drains and bunding were all assessed by the Council's Investigating Officer and found to be secure. The skimmer pits chemical analysis also demonstrated good compliance with concentrations of chloride, total petroleum hydrocarbons, pH and suspended solids all being within consent limits.

Downhole pressure readings for Ahuroa 3, 4 and 5ST-1 remained steady throughout the monitoring period, varying between 2,000-2,500 psi. Tophole pressure readings for Ahuroa 2A, 3, 4 and 5ST-1 varied between 750-2,000 psi for this monitoring period. Both showed compliance with consent 7432-1.

In terms of emissions to air, Ahuroa-B's total annual flaring came in at 51,084 Sm³ for the monitoring period. All monthly flaring data was logged, and compiled into their annual report which was submitted in July 2019.

3.2 Environmental effects of exercise of consents

Minimal environmental effects were noted for the Ahuroa-B Gas Storage facility in the 2018-2019 monitoring period. The two samples of the skimmer pit indicated compliance with the consent derived values of chloride, suspended solids, pH and total petroleum hydrocarbons. The site was also observed to be well kept with secure bunding and associated ring draining. Visual inspections of the discharge location indicated the skimmer pits were functioning as planned.

3.3 Evaluation of performance

A tabular summary of Ahuroa-B's compliance record for the 18-19 monitoring period is set out in Tables 4-7 below.

Table 4 Summary of performance for consent 3681-2

Purpose: To discharge treated stormwater and uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Ahuroa-B wellsite onto and into land and into and unnamed tributary of the Makara Stream in the Waitara catchment		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option to prevent or minimise adverse effects	Inspections	Yes
2. Catchment area limited	Inspections and records	Yes
3. Notification provided prior to commencement of site works or drilling	Not undertaken during period under review	N/A

Purpose: To discharge treated stormwater and uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Ahuroa-B wellsite onto and into land and into and unnamed tributary of the Makara Stream in the Waitara catchment		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Consent holder to provide site contingency plans for the site.	Most recent update May 2016	Yes
5. All stormwater and uncontaminated production water to be directed through a stormwater treatment system prior to discharge	Inspections, review of site plans	Yes
6. Stormwater system management and maintenance in accordance with consent application documentation	Inspection and liaison	Yes
7. Hazardous substance storage areas to be bunded and directed to sumps	Inspections	Yes
8. Limits on constituents in the discharge	Sampling indicated compliance with consent condition	Yes
9. Discharge shall not result in increase in temp or BOD downstream of the mixing zone	Not sampled during monitoring period	N/A
10. Controls on effect of discharge in receiving water	Inspections	Yes
11. Consent holder to notify prior to site reinstatement	Site still in use	N/A
12. Optional review provision re environmental effects	Next option for review in June 2021	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 5 Summary of performance for consent 7432-1

Purpose: To discharge contaminants (natural gas) into land for the purpose of gas storage		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent holder to adopt best practicable option at all times	Inspections, consent holder liaison and data review	Yes
2. Gas discharged must meet defined specifications	Not assessed	N/A
3. The pressure in the reservoir must not exceed 3,400 psi	Review of records	Yes
4. Consent holder to record injection pressure and reservoir pressure and supply to Council upon request	Data supplied and reviewed	Yes

Purpose: To discharge contaminants (natural gas) into land for the purpose of gas storage		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
5. Lapse condition	Consent exercised	N/A
6. Review provision	Next option for review in June 2021	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 6 Summary of performance for consent 7746-1

Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent holder to notify of flaring events longer than 5 minutes in duration	Notifications received as required	Yes
2. Consent holder to notify nearby residents of flaring events longer than 5 minutes in duration	No complaints received from neighbours	Yes
3. No alteration of plant equipment or processes leading to changes in the quality of emissions	Company records and inspections	Yes
4. Consent holder to monitor wind conditions prior to flaring	Company records not requested in current period	N/A
5. Liquids and solids to be separated prior to flaring	Company records and inspections	Yes
6. Consent holder to notify if unable to comply with special condition 5 and to immediately work to re-establish separation process	No instances of non-compliance with special condition 5	N/A
7. No liquids/solids to be combusted through the flare system unless during emergency		N/A
8. Consent holder to adopt BPO to minimise effects from emissions	Company records, inspections and annual report	Yes
9. Only treated substances from well stream to be combusted in flare pit	Company records, inspections	Yes
10. No objectionable odours or smoke beyond site boundary	Inspections, no complaints received	Yes
11. All hydrocarbon storage vessels shall be fitted with vapour recovery systems	Only produced hydrocarbon storage vessels on site so does not apply	N/A

Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
12. Opacity of emissions to not exceed level 1 on Ringlemann scale for more than 4 minutes	Not assessed	N/A
13. The consent holder shall control carbon monoxide emissions to not exceed 10 mg/m ³ under ambient conditions	Not assessed	N/A
14. Consent holder to control nitrogen oxide emissions to not exceed 100 ug/m ³ under ambient conditions	Not assessed	N/A
15. Consent holder to ensure other contaminants from flaring do not exceed workplace exposure standards (DOL, 2002)	Not assessed	N/A
16. Consent holder to make an analysis of the gas/condensate stream available on request	Not requested during monitoring period	N/A
17. Visible smoke instances to be recorded and supplied to Council upon request	Not requested	N/A
18. Consent holder to record flaring events in a log and supply records to Council in an annual report	Inspections, records received in annual report	Yes
19. The consent holder to supply an annual report during May	Report received July 2019	Partial
20. Optional review provision re environmental effects	Next option for review in June 2022	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 7 Evaluation of environmental performance over time (from 2014 onwards)

Year	Consent no	High	Good	Improvement required	Poor
2014-2015	3681-2	1			
	7432-1	1			
	7746-1	1			
2015-2016	3681-2	1			
	7432-1	1			
	7746-1	1			
2016-2017	3681-2	1			
	7432-1	1			

Year	Consent no	High	Good	Improvement required	Poor
	7746-1	1			
2017-2018	3681-2	1			
	7432-1	1			
	7746-1	1			
Totals		12			

During the year, the Company demonstrated a high level of environmental and a high level of administrative performance with the resource consents as defined in Section 1.2.

3.4 Recommendations from the 2017-2018 Annual Report

1. THAT in the first instance, monitoring of consented activities at Ahuroa-B Gas Storage (AGS) facilities and for the connecting pipeline to Stratford Power Station (SPS) in the 2018-2019 year continue at the same level as in 2017-2018.
2. THAT should there be issues with environmental or administrative performance in the 2018-2019 monitoring period, the monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

3.5 Alterations to monitoring programmes for 2019-2020

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

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

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

It is proposed that for the 2019-2020 monitoring period in relation to AGS and the associated pipeline that the monitoring programme remained unchanged from that undertaken in the 2018-2019 monitoring period.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site 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 2019-2020.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Ahuroa-B Gas Storage (AGS) facilities and for the connecting pipeline to Stratford Power Station (SPS) in the 2019-2020 year continue at the same level as in 2018-2019.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

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

BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m.
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m ³ s ⁻¹).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m ² /day	grams/metre ² /day.
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.
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.
mS/m	Millisiemens per metre.
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.
NH ₄	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH ₃	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO ₃	Nitrate, normally expressed in terms of the mass of nitrogen (N).

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).
Pb*	Lead.
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 , PM _{2.5} , PM _{1.0}	Relatively fine airborne particles (less than 10 or 2.5 or 1.0 micrometre diameter, respectively).
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.
Zn*	Zinc.

*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

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

Bibliography and references

Ministry for the Environment. 2018. Best Practice Guidelines for Compliance, Monitoring and Enforcement under the Resource Management Act 1991. Wellington: Ministry for the Environment.

Flexgas Ahuroa Gas Storage Annual Flaring Report May 2019.

Taranaki Regional Council (2016): *Stratford Power Station (TCC1 & SP1) Ahuroa Gas Storage Contact Energy Ltd Monitoring programme Annual report 2015-2016*. Technical Report 2016-115.

Taranaki Regional Council (2017): *Stratford Power Station (TCC1 and SP1) Ahuroa Gas Storage Contact Energy Ltd Monitoring Programme Annual Report 2016-2017*. Technical Report 2017-12.

Taranaki Regional Council (2018): *Stratford Power Station (TCC1 and SP1) Ahuroa Gas Storage Contact Energy Ltd Monitoring Programme Annual Report 2017-2018*. Technical Report 2018-50.

Appendix I

Resource consents held by the Company

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

Consent number	Purpose	Consent Granted/ Commencement Date	Change in Conditions Date	Next review date	Expiry date
Discharge to Air Permits					
7745-1*	Discharge emissions to air from flaring of hydrocarbons associated with well clean-up and well testing associated with exploration activities at Ahuroa-B wellsite	Oct 2009	-	2022	2028
7746-1	Discharge emission to air during flaring from well workovers and in emergency situations associated with production activities at Ahuroa-B wellsite, together with miscellaneous emissions	Oct 2009	-	2022	2028
Discharge to Water Permits					
3681-2	Discharge stormwater, site water and uncontaminated production water to land and Makuri Stream tributary in the Waitara catchment	Jan 2011	-	2021	2033
7621-1*	Discharge stormwater and sediment from Ahuroa-B site development (wellsite) earthworks to two unnamed Makara Stream tributaries	Apr 2010	-	2021	2027
Discharge to Land Permits					
7432-1	Discharge natural gas into land for purpose of gas storage	Apr 2011	-	2021	2027
5173-2*	Discharge solid drilling waste from hydrocarbon exploration operations at Ahuroa-B wellsite by mix-bury-covers	Jul 2003	-	-	2021
7748-1*	Discharge stormwater and sediment into/onto land from earthworks during extension of Ahuroa-B wellsite	Jan 2011	-	2021	2027
Land Use Permits					
7622-1*	Install, use and maintain a culvert in unnamed Makara Stream tributary	Apr 2010	-	2021	2027
7749-1*	Install pipe in bed of unnamed Makara Stream tributary	Jan 2011	-	2021	2027
7750-1.1*	Install and use a culvert in unnamed Makara Stream tributary	Mar 2016	-	2021	2027

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: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date
(Change): 12 January 2011

Commencement Date
(Change): 12 January 2011 (Granted Date: 22 April 2003)

Conditions of Consent

Consent Granted: To discharge treated stormwater, uncontaminated treated site water, and uncontaminated treated production water from hydrocarbon exploration and production operations at the Ahuroa-B wellsite onto and into land and into an unnamed tributary of the Makara Stream in the Waitara catchment

Expiry Date: 1 June 2033

Review Date(s): June 2021, June 2027

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford
(Property owner: G & K Bishop)

Grid Reference (NZTM) 1715625E-5652966N

Catchment: Waitara

Tributary: Makino
Makara

*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

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 adverse effects of the discharge on any water body.
2. The stormwater catchment area shall be no more than 40,000 m².
3. The Chief Executive shall be advised in writing at least 7 days prior to any site works commencing, and again in writing at least 7 days prior to any well drilling operation commencing.
4. The consent holder shall provide and maintain for the written approval of the Chief Executive site specific details relating to contingency planning for the wellsite.
5. All site water and uncontaminated production water to be discharged under this permit shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this permit.
6. The design, management and maintenance of the stormwater system shall be generally undertaken in accordance with the information submitted in support of application 6634.
7. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not to the stormwater catchment.
8. The following concentrations shall not be exceeded in the discharge:

Component	Concentration
pH (range)	6.5 - 8.5
suspended solids	100 gm ⁻³
total recoverable hydrocarbons (infrared spectroscopic technique)	15 gm ⁻³
chloride	50 gm ⁻³

This condition shall apply prior to the entry of the treated stormwater, site water and production water either onto and into land, or into surface water, at a designated sampling point approved by the Chief Executive.

Consent 3681-2

9. After allowing for reasonable mixing, within a mixing zone extending downstream of the discharge point(s) to the confluence of the two unnamed tributaries at (NZTM) 1715531E-5653067N the discharge shall not give rise to any of the following effects in the receiving waters of the unnamed tributary:
 - a) an increase in temperature of more than 2 degrees Celsius;
 - b) an increase in biochemical oxygen demand of more than 2.00 gm⁻³.

10. After allowing for reasonable mixing, within a mixing zone extending downstream of the discharge point(s) to the confluence of the two unnamed tributaries at (NZTM) 1715531E-5653067N the discharge shall not give rise to any of the following effects in the receiving waters of the unnamed tributary:
 - 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.

11. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise effects on stormwater quality.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015 and/or June 2021 and/or June 2027, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

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: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date: 16 July 2003

Commencement Date: 16 July 2003

Conditions of Consent

Consent Granted: To discharge solid drilling wastes from hydrocarbon exploration operations at the Ahuroa-B wellsite by mix-bury-cover

Expiry Date: 1 June 2021

Site Location: Ahuroa-B wellsite, Croydon Road, Te Popo
(Property owner: G & K Bishop)

Grid Reference (NZTM) 1715527E-5652866N

Catchment: Waitara

Tributary: Makara

*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

1. This resource consent allows for the discharge of up to 1500 m³ per well of solid drilling wastes (drill cuttings and residual fluids) by way of mix-bury-cover (MBC) into land on the Ahuroa-B Wellsite and surrounding land. MBC discharge areas for wastes from individual wells shall be kept separate and distinct.
2. Prior to the exercise of this consent for each separate mix-bury-cover (MBC) discharge the consent holder shall provide to the written satisfaction of the Chief Executive a report describing proposed MBC, including area, location, nature of material, means of compliance with conditions, etc, and the results of any relevant monitoring of existing MBC discharge sites under this consent. In any case additional MBC discharges shall not take place under this consent within 12 months of any previous MBC discharge, unless this requirement is waived in writing by the Chief Executive.
3. The resource consent holder shall notify the Taranaki Regional Council at least 48 hours prior to commencement, and upon completion of any discharge.
4. The resource consent holder shall ensure that the discharge, licensed by this resource consent, takes place in general accordance with the information submitted in support of application 2198. In particular but without limitation, any amendment to location of mix-bury-cover (MBC), pre-treatment of solids, changes to fluids/additives, method of MBC, or post burial site management, shall be advised to the Chief Executive, and shall not provide or result in any less environmental protection than that set out or provided for in the information submitted in support of application 2198.
5. The consent holder shall keep records of composition and volumes of the material to be discharged, including records of quantities and types of drilling fluids and additives used (materials and their composition), and shall forward the records to the Taranaki Regional Council prior to the discharge.
6. The edge of the mix-bury-cover zone shall be at least 30 metres from any surface water body, or any water supply bore.

Consent 5173-2

7. All ponded water shall be removed from the sump prior to the recovery/mixing operation.
8. The impermeable liner shall be perforated, and where possible removed, so that it no longer encloses the solid drilling wastes.
9. The solid drilling wastes (drill cuttings and residual fluids) shall be incorporated with uncontaminated soils with a mixing ratio of 1 part solid drilling wastes (drill cuttings, additives and residual fluids) to a minimum of 1 part uncontaminated soil.
10. The placement of the solid drilling wastes (drill cuttings and residual fluids) shall as far as practicable be above the watertable.
11. The loading in the disposed solid drilling wastes for each distinct mix-bury-cover disposal area for wastes from an individual well must not exceed those listed in Table 3-1 of the Alberta Energy and Utilities Board, 1996, G-50 guidelines.
12. Post disposal chloride levels in the cover soil layer shall not exceed 2,000 mg kg⁻¹.
13. The loading of chloride must not exceed 1,600 kg for each distinct mix-bury-cover disposal area for wastes from an individual well.
14. The loading of nitrogen must not exceed 400 kg for each distinct mix-bury-cover disposal area for wastes from an individual well.
15. The hydrocarbon content of the soil waste mix shall not exceed 0.1% (1000 mg/kg) on a dry weight basis.
16. The exercise of this consent shall not result in a level of total dissolved salts within any surface or groundwater of more than 2500 gm⁻³.
17. The disposal of solid drilling wastes shall comply with the heavy metal receiving environment concentration limits specified in Table C, Section 9, Public Guidelines for the Safe Use of Sewage Effluent and Sewage Sludge on Land, Ministry of Health, 1992.
18. The solid drilling wastes (drill cuttings and residual fluids) shall be covered by at least 0.5 m of uncontaminated soil, and shall be revegetated and thereafter maintained with pasture cover within 6 months of the completion of any mix-bury-cover operation.
19. The consent holder shall compact, contour, and maintain the cover layer of soil so as to ensure its integrity at all times to the satisfaction of the Chief Executive.
20. The consent holder shall adopt the best practicable option (as defined in the Resource Management Act 1991) to prevent or minimise any actual or potential effects on the environment arising from the discharge, including but not limited to any water body or soil.
21. The exercise of this resource consent, including the design, management and implementation of the mix-bury-cover discharge, shall not lead, or be liable to lead, to contaminants directly entering a surface water body from overland surface flows.

Consent 5173-2

22. The exercise of the resource consent shall not result in any adverse impacts on groundwater as a result of leaching, or surface water including aquatic ecosystems, and/or result in a change to the suitability of use of the receiving water as determined by the Chief Executive.
23. At any time, the levels of hydrocarbons in the soil shall comply with the guideline values for the designated soil type in the surface layer (less than 0.5 metre depth) set out in Tables 4.12 and 4.15 of the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Ministry for the Environment, 1999).
24. At any time, the upper (less than 0.5 metre depth) soil levels shall not exceed the following limits: conductivity, 290 mSm⁻¹; total dissolved salts, 2500 gm⁻³; sodium 460 gm⁻³; and chloride 700 gm⁻³.
25. This resource consent shall lapse on the expiry of six years after the date of issue of this resource consent, unless the resource 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.
26. The consent holder may apply to the Taranaki Regional Council for a change or cancellation of any of the conditions of this resource consent in accordance with section 127(1)(a) of the Resource Management Act 1991 to take account of operational requirements or the results of monitoring.
27. The Taranaki Regional Council may review any or all of the conditions of this resource consent within two months of receiving data on the volume and composition of the material under condition 5, for the purpose of assessing the adequacy of monitoring and mitigation measures.
28. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

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: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date
(Change): 7 April 2011

Commencement Date
(Change): 7 April 2011 (Granted Date: 2 December 2008)

Conditions of Consent

Consent Granted: To discharge contaminants (natural gas) into land for the purpose of gas storage

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, Barleymans Road, Tariki
(Property owners: GN & KA Bishop)

Grid Reference (NZTM) 1715630E-5652960N

Catchment: Waitara

Tributary: Makino
Makara

*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

1. Notwithstanding any other condition of this consent, 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 adverse effects on the environment from the exercise of this consent.
2. Any gas discharged into the ground pursuant to this consent shall meet NZ5442 specifications.
3. The pressure within the gas reservoir shall not exceed 3400psia.
4. The consent holder shall continuously record the injection pressure, and establish and maintain a correlation between the injection pressure and pressure within the gas reservoir, so that the reservoir pressure can be monitored at all time to determine compliance with condition 3. The pressure records shall be made available to the Council on request.
5. This consent shall lapse on 31 December 2013, 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.

Consent 7432-1

6. 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 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

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: Contact Energy Limited
P O Box 10742
WELLINGTON 6143

Decision Date: 06 October 2009

Commencement
Date: 06 October 2009

Conditions of Consent

Consent Granted: To discharge emissions to air from flaring of hydrocarbons associated with well clean-up and well testing associated with exploration activities at the Ahuroa-B wellsite at or about (NZTM) 1715699E-5652954N

Expiry Date: 1 June 2028

Review Date(s): June 2016, June 2022

Site Location: Ahuroa-B wellsite, Barleymans Road, Stratford
[Property owner: G & K Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD

*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 [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

Special conditions

Exercise of consent

1. Flaring shall not occur for more than 45 days, cumulatively, per zone for each well.

Information and notification

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 24 hours before the initial flaring of any new zone being commenced. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
3. 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 wellsite[s] 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.
4. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other wellsite 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.

Flaring

5. Other than for the maintenance of a pilot flare flames, 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 during well clean-up, drill stem testing, initial testing, well workovers, or production testing, or at any other time, must first be treated by effective liquid and solid separation and recovery, to ensure that smoke emission during flaring is minimised.
7. If separation required by condition 6 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 separation and recovery within three hours.

Consent 7745-1

8. Subject to special condition 7, no liquid or solid hydrocarbons shall be combusted through the gas flare system.
9. The gas shall be combusted so that emissions of smoke are minimised.
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 wellsites authorised under this consent [including use of a separator during well clean-up].
11. Only substances originating from the well stream and treated as outlined by conditions 6, 7, 8, 9, and 10 shall be combusted within the flare pits.
12. There shall not be any objectionable or offensive odour or smoke at or beyond the boundaries of the properties where the wellsites are located.
13. The opacity of any smoke emissions shall not exceed a level of 1, as measured on the Ringelmann Scale, for more than 4 minutes cumulative duration in any 60 minute period.
14. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flares so that, whether alone or in conjunction with any other emissions from the wellsites, 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 boundaries of the property where the wellsites are located.
15. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flares, so that whether alone or in conjunction with any other emissions from the wellsites, 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 [$\mu\text{g}/\text{m}^3$] [24-hour average exposure], or 200 $\mu\text{g}/\text{m}^3$ [1-hour average exposure] at or beyond the boundaries of the properties where the wellsites are located.
16. The consent holder shall control emissions to the atmosphere from the wellsites and flares 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 boundaries of the property where the wellsites are 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 C₆ 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 make available to the Chief Executive, Taranaki Regional Council, logs of all flaring, including time, duration, zone, and volumes of substances flared.

Review

20. 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 2016 and/or June 2022, 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; and/or
 - 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; and/or
 - c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant.

Transferred at Stratford on 12 January 2011

For and on behalf of
Taranaki Regional Council

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: GSNZ SPV1 Limited
 42 Connett Road West
 Bell Block
 New Plymouth 4312

Decision Date: 6 October 2009

Commencement Date: 6 October 2009

Conditions of Consent

Consent Granted: To discharge emissions to air from flaring of hydrocarbons
 associated with well clean-up and well testing associated
 with exploration activities at the Ahuroa-B wellsite

Expiry Date: 1 June 2028

Review Date(s): June 2022

Site Location: Ahuroa-B wellsite, Barleymans Road, Stratford
 (Property owner: G & K Bishop)

Grid Reference (NZTM) 1715699E-5652954N

*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

Exercise of consent

1. Flaring shall not occur for more than 45 days, cumulatively, per zone for each well.

Information and notification

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 24 hours before the initial flaring of any new zone being commenced. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
3. 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 wellsite(s) 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.
4. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other wellsite 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.

Flaring

5. Other than for the maintenance of a pilot flare flames, 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 during well clean-up, drill stem testing, initial testing, well workovers, or production testing, or at any other time, must first be treated by effective liquid and solid separation and recovery, to ensure that smoke emission during flaring is minimised.
7. If separation required by condition 6 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 separation and recovery within three hours.
8. Subject to special condition 7, no liquid or solid hydrocarbons shall be combusted through the gas flare system.

Consent 7745-1

9. The gas shall be combusted so that emissions of smoke are minimised.
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 wellsites authorised under this consent (including use of a separator during well clean-up).
11. Only substances originating from the well stream and treated as outlined by conditions 6, 7, 8, 9, and 10 shall be combusted within the flare pits.
12. There shall not be any objectionable or offensive odour or smoke at or beyond the boundaries of the properties where the wellsites are located.
13. The opacity of any smoke emissions shall not exceed a level of 1, as measured on the Ringelmann Scale, for more than 4 minutes cumulative duration in any 60 minute period.
14. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flares so that, whether alone or in conjunction with any other emissions from the wellsites, 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 $30 \text{ mg}/\text{m}^3$ one-hour average exposure) at or beyond the boundaries of the property where the wellsites are located.
15. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flares, so that whether alone or in conjunction with any other emissions from the wellsites, 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 ($\mu\text{g}/\text{m}^3$) (24-hour average exposure), or $200 \mu\text{g}/\text{m}^3$ (1-hour average exposure) at or beyond the boundaries of the properties where the wellsites are located.
16. The consent holder shall control emissions to the atmosphere from the wellsites and flares 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 boundaries of the property where the wellsites are located, is not increased above background levels:
 - a) by more than $1/30^{\text{th}}$ 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

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 C₆ 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 make available to the Chief Executive, Taranaki Regional Council, logs of all flaring, including time, duration, zone, and volumes of substances flared.

Review

20. 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 2016 and/or June 2022, 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; and/or
 - 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; and/or
 - c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

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: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date: 6 April 2010

Commencement Date: 6 April 2010

Conditions of Consent

Consent Granted: To discharge stormwater and sediment from earthworks into two unnamed tributaries of the Makara Stream, associated with site development at the Ahuroa-B wellsite

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford
(Property owner: GS & KA Bishop)

Grid Reference (NZTM) 1715699E-5652829N

Catchment: Waitara

Tributary: Makino
Makara

*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 accordance with the documentation submitted in support of application 6461. Specifically this includes Appendix B and plans NZ-2784-20-SK-0001/2 and NZ-2784-20-SK-0001/1. If there is any conflict between the documentation submitted in support of application 6461 and the conditions of this consent, the conditions of this consent shall prevail.
2. If any area of soil is exposed, all run off from that area shall pass through settlement ponds or sediment traps with a minimum total capacity of;
 - a) 100 cubic metres for every hectare of exposed soil between 1 November to 30 April; and
 - b) 200 cubic metres for every hectare of exposed soil between 1 May to 31 October;unless other sediment control measures that achieve an equivalent standard are agreed to by the Chief Executive of the Taranaki Regional Council.
3. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.
4. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities.
5. This consent shall lapse on 30 June 2015, 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.

Consent 7621-1

6. 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 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Land Use Consent
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date: 6 April 2010

Commencement Date: 6 April 2010

Conditions of Consent

Consent Granted: To install, use and maintain a culvert in an unnamed tributary of the Makara Stream in the Waitara River

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford
[Property owner: GS & KA Bishop]

Grid Reference (NZTM) 1715738E-5652776N

Catchment: Waitara

Tributary Makino
Makara

*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 culvert pipe shall have a diameter no less than 600 and be no longer than 22 metres.
2. The fill over the top of the culvert pipe shall be no deeper than 2.5 metres.
3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation and again at least 2 working days to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.
4. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
5. The culvert shall not obstruct fish passage.
6. The invert of the culvert shall at all times be slightly lower than the level of the surrounding riverbed so that it fills with bed material and simulates the natural bed.
7. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
8. The consent holder shall take all reasonable steps to:
 - a. minimise the amount of sediment discharged to the stream;
 - b. minimise the amount of sediment that becomes suspended in the stream; and
 - c. mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region*, by the Taranaki Regional Council, will achieve compliance with this condition.

9. The works shall remain the responsibility of the consent holder and be maintained so that:
 - a) it does not become blocked and at all times allows the free flow of water through it;
 - b) any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.

Consent 7622-1

10. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the culvert shall be removed and the area reinstated, if and when it is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.
11. This consent shall lapse on 30 June 2015, 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.
12. 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 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

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: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date: 6 October 2009

Commencement Date: 6 October 2009

Conditions of Consent

Consent Granted: To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions

Expiry Date: 1 June 2028

Review Date(s): June 2022

Site Location: Ahuroa-B wellsite, Barleymans Road, Stratford
(Property owner: G & K Bishop)

Grid Reference (NZTM) 1715699E-5652954N

*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

Information and notification

1. Other than in emergencies, 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.
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(s) 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. Notwithstanding any other condition of this consent 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 wellsites authorised under this consent (including use of a separator during well clean-up).

Consent 7746-1

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 objectionable or offensive odour or smoke at or beyond the boundaries of the properties where the wellsites are 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, for more than 4 minutes cumulative duration in any 60 minute period.
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 $30 \text{ mg}/\text{m}^3$ (one-hour average exposure) at or beyond the boundaries of the properties where the wellsites are located.
14. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flares so that, whether alone or in conjunction with any other emissions from the wellsites, 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 ($\mu\text{g}/\text{m}^3$) (24-hour average exposure), or $200 \mu\text{g}/\text{m}^3$ (1-hour average exposure) at or beyond the boundaries of the of the properties where the wellsites are located.
15. The consent holder shall control emissions to the atmosphere from the wellsites 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 flares, the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundaries of the properties where the wellsites are located, is not increased above background levels:
 - a) by more than $1/30^{\text{th}}$ 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

16. 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.
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.

Consent 7746-1

18. 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 19.
19. 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.

Review

20. 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 2016 and/or June 2022, 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; and/or
 - 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; and/or
 - c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

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: GSNZ SPV1 Limited
 42 Connett Road West
 Bell Block
 New Plymouth 4312

Decision Date: 18 January 2011

Commencement Date: 18 January 2011

Conditions of Consent

Consent Granted: To discharge stormwater and sediment from earthworks during the construction of the extension of the Ahuroa-B wellsite onto and into land

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford
(Property owner: G & K Bishop)

Grid Reference (NZTM) 1715527E-5652866N

Catchment: Waitara

Tributary: Makino
 Makara

*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. If any area of soil is exposed, all run off from that area shall pass through settlement ponds or sediment traps with a minimum total capacity of;
 - a) 100 cubic metres for every hectare of exposed soil between 1 November to 30 April; and
 - b) 200 cubic metres for every hectare of exposed soil between 1 May to 31 October;

unless other sediment control measures that achieve an equivalent standard are agreed to by the Chief Executive of the Taranaki Regional Council.

3. The obligation described in condition 2 above shall cease to apply, and accordingly the erosion and sediment control measures can be removed, in respect of any particular site or area of any site, only when the site is stabilised.

Note: For the purpose of conditions 3 and 4 "stabilised" in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in the Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an officer of the Taranaki Regional Council, an 80% vegetative cover has been established.

4. All earthworked areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities.

Note: For the purposes of this condition "stabilised" has the same definition as that set out in condition 3.

5. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to worknotification@trc.govt.nz.

6. This consent shall lapse on 31 March 2016, 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.

Consent 7748-1

7. 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 2015 and/or June 2021 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Land Use Consent
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: Contact Energy Limited
P O Box 10742
WELLINGTON 6143

Decision Date: 18 January 2011

Commencement
Date: 18 January 2011

Conditions of Consent

Consent Granted: To install and use a pipe in the bed of an unnamed tributary of the Makara Stream, including the associated reclamation, disturbance and deposition of material between (NZTM) 1715533E-5652692N and 1715550E-5652821N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford
[Property owner: G & K Bishop]

Legal Description: Pt Lot 1 DP 2699 Blk X Huiroa SD [Site of structure]

Catchment: Waitara

Tributary: Makino
Makara

*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 [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

Special conditions

1. This consent authorises the laying pipe in 140 metres of stream bed and subsequently filling the piped reach between grid references [NZTM] 1715533E-5652692N and 1715550E-5652821N.
2. The pipe shall have a diameter of not less than 600 mm.
3. The piping shall be maintained to ensure it does not become blocked and at all times allows the free flow of water through it.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation and again at least 2 working days to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
5. Any instream works shall take place only between 1 November and 30 April inclusive.
6. The consent holder shall take all reasonable steps to:
 - a) minimise the amount of sediment discharged to the stream;
 - b) minimise the amount of sediment that becomes suspended in the stream; and
 - c) mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region*, by the Taranaki Regional Council, will achieve compliance with this condition.

7. No vegetation shall be buried within 20 metres of the stream.
8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

Consent 7749-1

9. This consent shall lapse on 31 March 2016, 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 2015 and/or June 2021, 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 18 January 2011

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Land Use Consent
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: GSNZ SPV1 Limited
 42 Connett Road West
 Bell Block
 New Plymouth 4312

Decision Date: 18 January 2011

Commencement Date: 18 January 2011

Conditions of Consent

Consent Granted: To install and use a pipe in the bed of an unnamed tributary
 of the Makara Stream, including the associated reclamation,
 disturbance and deposition of material

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford
 (Property owner: G & K Bishop)

Grid Reference (NZTM) Between 1715533E-5652692N & 1715550E-5652821N

Catchment: Waitara

Tributary Makino
 Makara

*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. This consent authorises the laying pipe in 140 metres of stream bed and subsequently filling the piped reach between grid references (NZTM) 1715533E-5652692N and 1715550E-5652821N.
2. The pipe shall have a diameter of not less than 600 mm.
3. The piping shall be maintained to ensure it does not become blocked and at all times allows the free flow of water through it.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation and again at least 2 working days to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
5. Any instream works shall take place only between 1 November and 30 April inclusive.
6. The consent holder shall take all reasonable steps to:
 - a) minimise the amount of sediment discharged to the stream;
 - b) minimise the amount of sediment that becomes suspended in the stream; and
 - c) mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region*, by the Taranaki Regional Council, will achieve compliance with this condition.

7. No vegetation shall be buried within 20 metres of the stream.
8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

Consent 7749-1

9. This consent shall lapse on 31 March 2016, 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 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Land Use Consent
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: GSNZ SPV1 Limited
 42 Connett Road West
 Bell Block
 New Plymouth 4312

Decision Date 16 March 2016
(Change):

Commencement Date 16 March 2016 (Granted Date: 18 January 2011)
(Change):

Conditions of Consent

Consent Granted: To place and use a culvert in an unnamed tributary of the
 Makara Stream for access purposes

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford

Grid Reference (NZTM) 1715558E-5652753N

Catchment: Waitara

Tributary Makino
 Makara

*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 culvert shall be constructed in accordance with the plan prepared by Transfield Worley Hawkins titled "Ahuroa Gas Storage Project Stage 2B/2C Sediment & Drainage Management" reference NZ-W820-15-EA-0001/2, provided to the Council with application 6637. In the case of any contradiction between the drawing(s) and the conditions of this consent, the conditions of this consent shall prevail.
2. The culvert pipe shall have a diameter no less than 600 mm and be no longer than 20 metres.
3. The fill over the top of the culvert pipe shall be no deeper than 4 metres.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
5. Any instream works shall take place only between 1 November and 30 April inclusive.
6. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
7. The culvert shall not obstruct fish passage.
8. The invert of the culvert shall at all times be slightly lower than the level of the surrounding riverbed so that it fills with bed material and simulates the natural bed.
9. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
10. The consent holder shall take all reasonable steps to:
 - a. minimise the amount of sediment discharged to the stream;
 - b. minimise the amount of sediment that becomes suspended in the stream; and
 - c. mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region*, by the Taranaki Regional Council, will achieve compliance with this condition.

Consent 7750-1.1

11. The works shall remain the responsibility of the consent holder and be maintained so that:
 - a. it does not become blocked and at all times allows the free flow of water through it;
 - b. any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.
12. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the culvert shall be removed and the area reinstated, if and when it is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.
13. This consent shall lapse on 1 June 2027, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Appendix II

Resource consents held by the Company for AGS to SPS pipeline

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

Consent number	Purpose	Consent Granted/ Commencement Date	Change in Conditions Date	Next review date	Expiry date
Land Use Permits					
9309-1 to 9322-1*	Install and use pipeline for conveying gaseous hydrocarbons under various streams between Ahuroa-B wellsite and SPS	Aug 2012	-	2022	2028
9576-1*	Install and use a culvert in an unnamed Makara Stream tributary for associated realignment	Jun 2013	-	2021	2027

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.

Consents 9309-1, 9310-1, 9311-1, 9312-1, 9313-1, 9314-1, 9315-1
9316-1, 9317-1, 9318-1, 9319-1, 9320-1, 9321-1, 9322-1

Land Use Consent
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: GSNZ SPV1 Limited
42 Connett Road West
Bell Block
New Plymouth 4312

Decision Date: 30 August 2012

Commencement Date: 30 August 2012

Conditions of Consent

Consent Granted: To install and use a pipeline for conveying gaseous hydrocarbons under the bed of an unnamed tributary of the Makara Stream

Expiry Date: 1 June 2028

Review Date(s): June 2022

Site Location: Pipeline route between Ahuroa-B wellsite and the Stratford Power Station

Grid Reference (NZTM) Various

Catchment: Patea
Waitara

Tributary Kahouri
Makara
Ahuroa
Pikau

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

Consents 9309-1, 9310-1, 9311-1, 9312-1, 9313-1, 9314-1, 9315-1
9316-1, 9317-1, 9318-1, 9319-1, 9320-1, 9321-1, 9322-1

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. These consents authorise the installation and use of a pipeline at or about the locations specified below:

Crossing No.	Consent No.	Location [Map Reference]	Stream
1	9309-1	1715550E-5652867N	Unnamed tributary – Makara Stream
2	9310-1	1715691E-5651133N	Unnamed tributary – Ahuroa Stream
3	9311-1	1715731E-5650473N	Unnamed tributary – Makara Stream
4	9312-1	1715781E-5650005N	Unnamed tributary – Makara Stream
5	9313-1	1715617E-5649687N	Unnamed tributary – Makara Stream
6	9314-1	1715374E-5649461N	Unnamed tributary – Makara Stream
7	9315-1	1714309E-5648554N	Unnamed tributary – Kahouri Stream
8	9316-1	1714065E-5648223N	Unnamed tributary – Kahouri Stream
9	9317-1	1713960E-5647439N	Unnamed tributary – Piakau Stream
10	9318-1	1713745E-5647083N	Piakau Stream
11	9319-1	1713646E-5646976N	Unnamed tributary – Piakau Stream
12	9320-1	1713627E-5646659N	Unnamed tributary – Piakau Stream
13	9321-1	1713619E-5646155N	Unnamed tributary – Piakau Stream
14	9322-1	1713547E-5645926N	Kahouri Stream

2. At least 48 hours prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the installation of the pipelines including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
3. 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 the discharge of sediment to any surface water body and to prevent or minimise any adverse effects of the disturbance activities on any surface water body.
4. All pipelines shall be buried to an initial burial depth not less than 2 metres below the bed of the streams.
5. Any work undertaken in the bed of the streams shall be undertaken only between 1 November and 31 May.
6. The consent holder shall ensure that the area and volume of river bed disturbance is restricted to a practicable minimum and that areas disturbed from the exercise of this consent are reinstated as near as practicable to pre-work condition.

Consents 9309-1, 9310-1, 9311-1, 9312-1, 9313-1, 9314-1, 9315-1
9316-1, 9317-1, 9318-1, 9319-1, 9320-1, 9321-1, 9322-1

7. The consent holder shall take all reasonable steps to:
 - a. minimise the amount of sediment discharged to the stream;
 - b. minimise the amount of sediment that becomes suspended in the stream; and
 - c. mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki Region*, by the Taranaki Regional Council, will achieve compliance with this condition.
8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.
9. This consent shall lapse on 30 September 2017, 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 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Land Use Consent
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of
Consent Holder: GSNZ SPV1 Limited
 42 Connett Road West
 Bell Block
 New Plymouth 4312

Decision Date: 6 June 2013

Commencement Date: 6 June 2013

Conditions of Consent

Consent Granted: To install and use a culvert in an unnamed tributary of the
 Makara Stream, including associated realignment,
 streambed disturbance and reclamation

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford

Grid Reference (NZTM) 1715566E-5652807N

Catchment: Waitara

Tributary Makino
 Makara

*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 culvert and stream realignment shall be constructed in accordance with the information provided in the application, including drawing NZ-W828-20-DD-31001-01, Revision A0 and dated March 2013. In the case of any contradiction between the information and the conditions of this consent, the conditions of this consent shall prevail.
2. The culvert shall be no longer than 22 metres.
3. The fill over the top of the culvert shall be no deeper than 3 metres.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement of the outstanding works. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.
5. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
6. The consent holder shall install headwalls and rock rip rap at the outlet and inlet of the culvert.
7. The grading of the rock rip rap is of the following specification:
 - a. 100% less than 450 mm diameter;
 - b. 50% greater than 350 mm diameter; and
 - c. 90% greater than 150 mm diameter.
8. That consent holder shall ensure that rock rip rap armouring is placed a minimum:
 - a. height and distance of 0.5 metres and 3 metres along the banks of the new channel and at the location where the new alignment deviates from the old alignment; and
 - b. distance of 3 metres across the full width of the bed of the new stream channel.
9. On completion of the realignment work:
 - a. the banks of the reconstructed channel shall have a slope no steeper than 1 horizontal to 1 vertical. Where the bank consists of fill, the slope will be no steeper than 2 horizontal to 1 vertical; and
 - b. the bed of the reconstructed channel shall be at an appropriate grade so as to provide for fish passage; and
10. The final slope of the channel banks above the culvert shall be no steeper than 1.5 horizontal to 1 vertical.

Consent 9576-1

11. The invert of the culvert shall be set below the existing streambed by at least 20% of the culvert diameter so that it fills with bed material and simulates the natural bed.
12. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
13. The consent holder shall take all reasonable steps to:
 - a. minimise the amount of sediment discharged to the stream;
 - b. minimise the amount of sediment that becomes suspended in the stream; and
 - c. mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region*, by the Taranaki Regional Council, will achieve compliance with this condition.

14. All earthwork areas shall be stabilised as soon as is practicable immediately following the completion of soil disturbance activity.

Note: For the purpose of this condition "stabilised" in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using indurated rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an Investigating Officer, Taranaki Regional Council, an 80% vegetative cover has been established.

15. The culvert structure and new stream channel shall remain the responsibility of the consent holder and be maintained so that:
 - a. the culvert does not become blocked and at all times allows the free flow of water through them; and
 - b. any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.
16. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisation, or consent, have been obtained.
17. This consent shall lapse on 30 June 2018, 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.

Consent 9576-1

18. 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 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 3 October 2018

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

Appendix III

Annual Flaring Report for 2018-2019 by the Company

Ahuroa Gas Storage Annual Flaring Report

May 2019



Introduction

Condition 19 of Consent 7746-1 requires:

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.*

Energy Efficiency Measures Implemented at Ahuroa Gas Storage

No efficiency measures have been implemented at Ahuroa Gas Storage during the current reporting period.

Flexgas has been working to minimise process upsets that lead to plant trips and flaring events as ongoing improvement to the plant operations. We have been making small improvements in the plant operations to reduce the number of plant trips and hence flaring events.

Flaring & Flare Emissions

Flaring at the Ahuroa Gas Storage facility is a primary safety mechanism to dispose of gas from process upsets, plant shutdowns and start-ups, well testing and pipeline depressurisation by converting to products of combustion rather than flaring unburnt hydrocarbon gas. Flaring is only undertaken as absolutely necessary due to the economic cost of flaring stored gas.

A pilot flare is maintained at all times to ensure that there is a source of ignition for flared gas to ensure safe ignition, meaning there is a small continual amount of gas continually being flared.

The flare installed at Ahuroa was designed by the original equipment manufacturer John Zink to have a high combustion efficiency, smokeless operation and reduced air emissions. Contact conduct regular maintenance on the flare system to ensure the flare continues to operate as per design.

Smoke Emissions

There have been no visible smoke emissions at Ahuroa as a result of exercising consent 7746-1 during the current reporting period.

Complaints Received relating to Ahuroa Gas Storage

No complaints have been received as a result of any flaring events or smoke emissions at Ahuroa during the current reporting period

Technological Advances Relevant to any Discharge to Air

Technological advances to plant such as Ahuroa Gas Storage to reduce current discharges to air are limited given the intermittent nature of the facility and the flaring events.

Potential exists to recover gas sent to flare and re-use within the plant with the addition of Flare Gas Recovery Units. However, given the intermittent nature of operation of Ahuroa the flaring events are as a result of plant trips or process upsets which does not allow for the collection and re-use of the flare gases in part of the plant using gas. Therefore, these measures have not been pursued further

Flexgas is currently in the process of expanding the daily injection and extraction capability of Ahuroa, in which the starting system on the existing injection compressor is being upgraded from a gas starting system to an air start system.