

Methanex Motunui and Waitara Valley
Combined Monitoring Programme
Annual Report
2018-2019

Technical Report 2019-30

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Executive summary

Methanex New Zealand Ltd (Methanex) operates methanol production facilities located at Motunui and Waitara Valley, in the Manu, Waihi and Waitara River catchments. This report for the period July 2018 to June 2019 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess Methanex'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 Methanex's activities.

Methanex holds 11 resource consents, which include a total of 111 special conditions setting out the requirements that Methanex must satisfy. Methanex holds two consents to allow it to take and use water from two abstraction points on the Waitara River. Six consents allow the discharge of effluent/stormwater into the Manu and Waihi Streams and the Tasman Sea via the Waitara marine outfall. Methanex also holds two consents to discharge emissions into the air at its sites. Finally, one consent provides for a structure in the Waitara River associated with the water take.

During the monitoring period, Methanex demonstrated an overall High level of environmental performance at its Motunui site and a High level of environmental performance at its Waitara Valley site.

The Council's monitoring programme for the year under review included four inspections, continuous self-monitoring by Methanex (specifically involving collection of water samples for physicochemical analysis), review of regularly provided consent holder data and two inter-laboratory comparisons.

The monitoring showed that Methanex operated both sites in accordance with the requirements of their resource consents. As in previous years, the facilities were well managed and a high level of housekeeping was maintained.

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

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 in the year under review.

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

1.1.1 Introduction

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 Methanex New Zealand Ltd (Methanex). This company was formed on the first of January 2015, when the two previously separate Methanex companies (Methanex Motunui Ltd and Methanex New Zealand Ltd) were amalgamated.

Methanex operates a methanol production facility located on the coast at Motunui, close to Waitara (the Motunui site), and a second facility located 2.5 km south east and upstream of the mouth of the Waitara River (the Waitara Valley site). The Motunui site is located across the Manu and Waihi Stream catchments, and the Waitara Valley site is situated in the Waitara River catchment. Together, these facilities can produce up to 6,500 tonnes of methanol a day.

This report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Methanex that relate to abstractions and discharges of water within the Waitara River catchment, and the air discharge permits held by Methanex to cover emissions to air from their sites.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of Methanex's use of water, land and air.

The Council began reporting its monitoring of Methanex in 1990. This report is the 39th report to be prepared by the Council to cover Methanex's various consented activities and their environmental performance.

1.1.2 Structure of this report

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

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

Section 2 presents the compliance monitoring of the Motunui site during the period under review, including scientific and technical data. Thereafter the results are discussed, together with their interpretations, and their significance for the environment.

Section 3 presents the compliance monitoring of the Waitara Valley site during the period under review, including scientific and technical data. Thereafter the results are discussed, together with their interpretations, and their significance for the environment.

Section 4 presents a summary of 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.

1.1.3 The Resource Management Act 1991 and monitoring

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

- a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
- b. physical effects on the locality, including landscape, amenity and visual effects;
- c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
- d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
- e. risks to the neighbourhood or environment.

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

1.1.4 Evaluation of environmental and administrative performance

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

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with Methanex'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

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

1.2 Historical overview and process description

Historical overview

The Motunui facility was constructed in 1983 and was originally operated by the New Zealand Synthetic Fuels Corporation to produce petrol from natural gas, during the 'Think Big' era. The decision to build the facility was made under the *National Development Act 1979*. New Zealand Synthetic Fuels Corporation operated two production units, Methanol 1 and Methanol 2 as well as a gasoline to methanol plant. At that stage, crude methanol was an intermediate product in the process.

From 1995 to 2004 the Motunui site ran at close to full production. Around the end of this period, shifts in world demand favoured the production of high grade methanol and this became more profitable for Methanex than its then current operation of conversion of methanol to petrol. As a consequence the synthetic petrol part of the facility was de-commissioned and dismantled in October 2008 following a four year period during which the facility had remained idle. One production unit, Methanol 2, was restarted in 2008 and the restart of Methanol 1 took place in 2012. Presently the Motunui site operates at full capacity.

The Waitara Valley site was originally established by Petralgas Chemicals NZ Ltd (a 50:50 New Zealand government and Alberta Gas partnership) in 1983 as a self-contained facility to convert gas from the offshore Maui field into high grade methanol. Subsequently the facility changed ownership to Petrocorp and Fletcher Challenge Methanol until 1994 when Methanex Motunui Ltd gained ownership of the site. In 1989, a second distillation tower was installed at the site to enable crude methanol supplied from the Motunui site to be processed into high grade methanol at the Waitara Valley site. The construction of two methanol distillation towers at the Methanex Motunui site in 1994 and 1995 led to modifications of the Waitara Valley site, to allow transfer of crude and refined methanol between the two sites and the port. The Waitara Valley site which had continued to operate between 2004 and 2008 while production at the Motunui facility had ceased, was laid up in November 2008 soon after the restart of the larger Motunui facility. The Waitara Valley site retained importance as a storage facility and a load out site for product going by truck to Tauranga. A restart of the Waitara Valley facility took place in October 2013.

Methanol manufacture

Production of methanol from natural gas (sourced from various Taranaki fields) involves a three stage process. A brief outline of the methanol production process is given below:

Phase 1: Reforming

Natural gas entering the plant undergoes a preparation treatment involving the removal of contaminants (such as sulphur) prior to the reforming process. The processed gas is then mixed with steam (processed from water taken from the Waitara River) at approximately 500°C, before being passed through a reformer containing a nickel catalyst at 900°C. The heat is achieved by burning fuelgas, a mixture of natural gas and waste gases from within the process. Waste heat is recovered for steam generation before the flue gases are discharged to the atmosphere at about 110°C. A synthesis gas is produced in the reformer which contains hydrogen, carbon dioxide, carbon monoxide, methane and nitrogen.

Phase 2: Compression and synthesis

The next phase of the process requires the synthesis gas produced in the reformers to be pressurised (1,500 kPa to 8,600 kPa). The synthesis process involves changing the synthesis gas through a further chemical reaction to a form of crude methanol. This reaction involves the channelling of compressed gas into a methanol converter containing a copper/zinc catalyst which yields crude methanol.

Phase 3: Distillation

The distillation process is a low-pressure process, whereby the crude methanol is purified to form chemical grade methanol. There are two distillation towers at Waitara Valley and two at Motunui, which are used to carry out this process.

1.3 Resource consents

Methanex holds 11 resource consents the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 2 and 3 of this report.

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

Table 1 Resource consents held by Methanex during the 2018-2019 period

| Consent holder | Consent number | Purpose | Granted | Review | Expires |
|----------------------------------|----------------|---|---------------|-----------|-------------|
| <i>Water abstraction permits</i> | | | | | |
| Methanex Motunui | 0820-2 | To take from Waitara River | 29 April 2008 | June 2015 | 1 June 2021 |
| Methanex Waitara | 0801-2 | To take from Waitara River at two locations | 29 April 2008 | June 2015 | 1 June 2021 |
| <i>Water discharge permits</i> | | | | | |
| Methanex Motunui | 0822-2 | To discharge uncontaminated stormwater to Waihi and Manu Streams | 29 Nov 2012 | June 2015 | 1 June 2027 |
| Methanex Motunui | 0825-3 | To discharge uncontaminated stormwater to an unnamed tributary of the Waitara River | 31 March 2008 | June 2015 | 1 June 2021 |
| Methanex Motunui | 0827-3 | To discharge wastewater to an unnamed tributary of the Waitara River | 31 March 2008 | June 2015 | 1 June 2021 |
| Methanex Motunui | 3400-2 | To discharge treated wastewater and stormwater to the Tasman Sea | 29 April 2008 | June 2015 | 1 June 2021 |
| Methanex Waitara | 0802-2 | To discharge stormwater to the Waitara River | 31 March 2008 | June 2015 | 1 June 2021 |
| Methanex Waitara | 3399-2 | To discharge treated wastewater and stormwater to the Tasman Sea | 29 July 2013 | June 2015 | 1 June 2021 |
| <i>Air discharge permit</i> | | | | | |
| Methanex Motunui | 4042-3 | To discharge contaminants to air | 12 Feb 2008 | June 2023 | 1 June 2028 |
| Methanex Waitara | 4045-3 | To discharge contaminants to air | 29 April 2008 | June 2015 | 1 June 2021 |
| <i>Land use permits</i> | | | | | |
| Methanex Waitara | 3960-2 | To construct rock groyne in the Waitara River | 14 May 2003 | June 2015 | 1 June 2021 |

1.4 Monitoring programme

1.4.1 Introduction

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

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

The monitoring programme for both sites consisted of four primary components.

1.4.2 Programme liaison and management

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

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

1.4.3 Site inspections

Both the Motunui and Waitara Valley sites were inspected four times during the monitoring period. On two occasions, the monitoring included the inspection of the raw water intake facilities. A further two site visits were undertaken for the purpose of collecting split samples for inter-laboratory comparisons.

With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by Methanex were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.

1.4.4 Data review

Methanex undertakes a significant amount of self-monitoring of their own activities and associated environmental impacts. The data gathered is reported to the Council on a monthly basis, and is reviewed by the Council to determine compliance with resource consent conditions.

The raw water abstraction rate from two locations on the Waitara River for the Motunui site was measured continuously. Monthly reports detailing wastewater and stormwater discharge rates, volumes and composition were provided by Methanex to the Council. Wastewater effluent was monitored for a number of parameters with frequencies ranging from continuously (flow and pH) to monthly (trace metals).

These regular records provided to the Council are detailed in Table 2.

Table 2 Regular consent holder monitoring reporting requirements

| Consent | Reporting requirement | Provision to the Council | |
|------------------|---|-------------------------------|--------------------------------------|
| | | Frequency required by consent | Frequency provided by consent holder |
| 0820-2 | Abstraction rate and volume | Yearly | Monthly |
| 0801-2 | | | |
| 0802-2 | Testing of stormwater quality | Consent not exercised | |
| 0822-2 | Testing of stormwater quality | Not specified | Monthly |
| 3399-2 3400-2 | Testing of treated waste and stormwater | Yearly | Monthly |
| | Records of volumes and rate discharged | Monthly | |
| | Records of chemical dosing | Yearly | |
| 4045-3 | Air quality monitoring | 3 Yearly | 3 Yearly |
| 4042-3 | | 2 Yearly | 2 Yearly |

Methanex is also required to provide the Council with several reports addressing various receiving environments, site activities and investigations. These reports are outlined below. Additional details of the reports received during the 2018-2019 monitoring year may be found in the Motunui and Waitara Valley results sections of this report (section 2 and 3).

Air emissions

Methanex is required to supply Council with a report every two years addressing air emission issues from Motunui. This report is a requirement of consent 4042-3 (granted in April 2008).

The Waitara Valley consent has similar requirements but different time frames. Consent 4045-3 requires a three yearly report on technological advances regarding various emissions (including the cooling tower plume), an inventory of emissions from the distillation tower, energy efficiency improvements and any other matters relating to the mitigation of emissions.

Methanex reports on emissions from both sites in a biennial report. The latest biennial report was received in September 2018 and addressed the monitoring, developments and investigations undertaken in 2016 and 2017. This report is discussed in section 2 and 3 of this monitoring report. The next emissions report is expected in 2020 and will cover the 2018 and 2019 calendar years.

Methanex is also required to supply Council with a report every five years addressing advances in technology to minimise the effect of the Motunui site's water vapour plume. This report is a requirement of consent 4042-3 (granted in April 2008). The most recent report was received in October 2014, and the next report will be due in 2019 and will be included in the 2019-2020 annual compliance monitoring report.

Water take from the Waitara River

Methanex is required to supply Council with a report every two years addressing the programme Methanex has in place to reduce their use of water. This report is a new requirement of consent 0820-2 and 0801-2 (granted in April 2008). The most recent report was received during the 2018-2019 monitoring period and is discussed in section 2.2.3.1 of this report. These reports cover developments and initiatives over the two preceding years. The next report is expected in 2020 and will cover the 2018 and 2019 calendar years.

Methanex is also required to supply Council with a report every five years showing the results of the testing of the water take pipeline. This report is a requirement of consent 0820-2 and 0801-2 (granted in April 2008). The first report was due in 2013. Practical limitations associated with the testing of the pipeline has

resulted in this report being delayed. The Council have been in ongoing discussions with Methanex in regard to this matter. A report was received in September 2018 detailing a video scope inspection of the pipeline. This is discussed further in Section 2.2.31 of this monitoring report.

Contingency plans

Consent 3399-2 and 0822-2 both require the provision of a contingency plan by Methanex to the Council. It is required that these are maintained and consent 3399-2 specifies that the contingency plan should be reviewed every two years. These plans were received by the Council in September 2014 and a review of these was undertaken by Methanex in 2016 and January 2018. No changes were required. The next review is expected before the end of 2020.

Marine outfall

Every five years the Council may require Methanex to supply certification of the integrity and dilution performance of the marine outfall pipe. This is a pipe that provides for the discharge of wastewater/ stormwater approximately 1,250 m offshore from the mouth of the Waitara River in the Tasman Sea. The marine outfall report is a new requirement of consent 3400-2 and 3399-2 (granted in April 2008). The first report was provided in 2013.

Treated stormwater and wastewater annual report

Methanex is also required to supply Council with a report annually addressing their waste treatment discharges. This is a requirement of consent 3400-2 and 3399-2 (granted in April 2008). The last report covered the 2014 calendar year, and was received in April 2015. An agreement was reached with the Council that as monthly reports are supplied by Methanex there would be no requirement for an additional annual report as effectively the collation of the monthly reports equate to annual reporting.

1.4.5 Inter-laboratory comparisons

On two occasions during the monitoring period samples from the Motunui site were taken by the Council and Methanex simultaneously. Similarly on one occasion samples were collected at the Waitara Valley site. Both laboratories analysed the samples for parameters relevant to the consents and the results were compared.

2 Motunui

2.1 Process description

The Motunui facility (Photo 1 and Figure 1) has two production units, with a combined methanol production capacity of 5,000 tonnes per day (1.82 million tonnes per year). The Methanol 2 production unit was restarted and began to produce methanol in October 2008 after lying idle for four years. The Motunui Methanol 1 production unit began producing methanol again in July 2012. Increased monitoring was implemented during that restart. The monitoring was reduced back to normal levels during 2013-2014 and has continued as such during the current monitoring period.



Photo 1 Cooling towers and distillation stacks at the Methanex Motunui site

Figure 1 presents the layout of the site and references various components that will be referred to in this report.

2.1.1 Water discharges

There are various sources of wastewater from processes associated with the methanol manufacturing activities at the site, including water treatment wastes, boiler, cooling tower and other blowdowns, sewage, process effluents and stormwater.

- Sludge removed from the clarifiers is allowed to settle in the sludge lagoons. The water from this process is either allowed to evaporate or is discharged via the outfall.
- Naturally occurring dissolved salts in the abstracted river water are removed using ion exchange resins. Process boiler condensates for reuse also go through ion exchangers to remove trace minerals. The resins are regenerated using sulphuric acid and sodium hydroxide. The waste flow is neutralised prior to discharge via the outfall.
- The on-site boilers are fed with demineralised water with added deposit and corrosion control agents. To prevent a build-up of contaminants in the boiler water a portion of the boiler water is continuously removed (blowdown) and replaced with fresh treated water. This wastewater goes to the blowdown pond and is discharged via the outfall.

- The cooling towers function by the evaporation of treated clarified river water. Dissolved river salts could build up rapidly in the water and therefore substantial quantities (about one seventh of the volume) is blown down during each recirculation cycle. The cooling water blowdown may contain corrosion inhibitors, dispersants, surfactants, biocides and antifoams. This wastewater also goes to the blowdown pond and is discharged via the outfall.
- Process wastewaters from the methanol plant saturators and miscellaneous wastes from gauge glasses, sample connections, pump pads, vessel drains and the like.

Those process effluents that require treatment are diluted with other cleaner waste streams and are passed through a trickling filter and activated sludge system before being discharged via the ocean outfall.

Historically, domestic effluent was pumped to a New Plymouth District Council (NPDC) sewer line for treatment at the Waitara Wastewater Treatment Plant (WWWTP). Thereafter the treated wastewater was discharged to the Tasman Sea via the Waitara marine outfall. In the 2013-2014 monitoring period, major work was undertaken to convert the WWWWTP to a pump station. The Waitara pump station was commissioned on 15 October 2014 at which point pumping of Waitara municipal sewage to the New Plymouth Wastewater Treatment Plant (NPWWTP) commenced, and treatment and discharge of municipal sewage to the Tasman Sea via the Waitara marine outfall ceased.

Stormwater from the processing areas of the site that has the potential to be contaminated, drains into the stormwater pond under gravity and is then pumped to the effluent treatment plant and discharged via the marine outfall. Stormwater from the tankage area is pumped over into the process sewers which flow to the storm pond. The stormwater falling on the non-process areas of the western half of the site (Figure 1) is directed by "v" ditches running alongside the roads to a dam known as the Duck Pond and then out to the Tasman Sea via the Manu Stream. Stormwater falling on the eastern side of the site is directed to unnamed tributaries of the Waihi Stream via outfalls and a small sedimentation pond.

Sludge from the storm pond, off-spec pond and blow down pond stored in lagoons 2, 3, and 4 was removed during 2006. The sludge in lagoon 1 is removed periodically and was most recently removed in September 2018 and disposed of to the Remediation NZ Uruti facility after the soil was analysed and confirmation was given by the Council.

With the site running at full production again, three of the four previously emptied sludge ponds are being used only for dewatering the less contaminated river-silt backwash from the Waitara River water. The other sludge pond (lagoon 1) is used to keep more contaminated waste streams separate.



Figure 1 Motunui site layout and water sampling site locations

2.1.2 Emissions to air

The major sources of emissions to air are shown in Figure 2. The greatest quantities of air discharges from the Methanex complex were emitted from the reformer stacks. The flue gases are the products of combustion reactions within the steam reformers. They comprise gases typical of any combustion processes based on natural gas i.e. nitrogen passing through the process unchanged from the atmospheric air drawn in to support combustion, water (from oxygen in the air reacting with hydrogen in natural gas), carbon dioxide (created similarly) and residual oxygen. There are also traces of nitrogen oxides due to atmospheric nitrogen oxidising in the heat of the reformers.

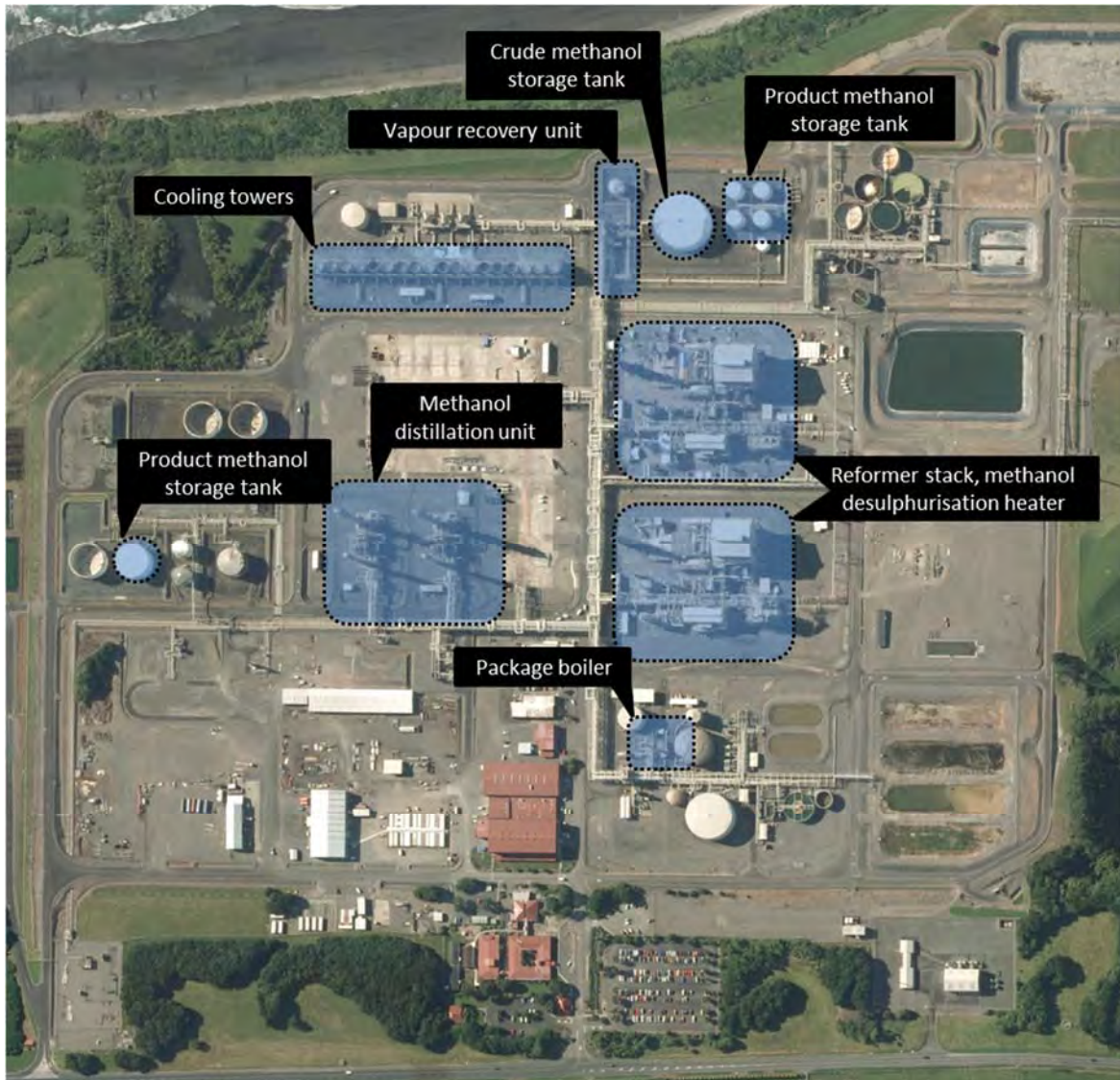


Figure 2 Major process air emission sources at Motunui

Energy efficiency and usage

The integrated nature of the site allows energy recovery and utilisation. At the same time, a large amount of energy is required to drive some of the reactions and refining stages. The volume of gas that may be accessed as raw feedstock by Methanex is fixed by the capacity of the feedstock systems, so that increased productivity and profitability are determined by in-house efficiency and loss control. More specifically, as in-plant efficiency increases, then the amount of carbon dioxide emitted as an exhaust gas per unit of product decreases.

The feedstock gas is preheated by excess heat recovered from other parts of the process, before being reformed to synthesis gas by the injection of steam and with additional heat energy generated by burning both natural gas and waste streams. The exhaust flue gases also have heat recovered from them, to preheat the feedstock gas and to raise steam.

The reaction of the synthesis gas over a catalyst to produce methanol releases heat, which is captured via heat exchanges for use elsewhere. Unreacted synthesis gases are bled off to avoid accumulation and are burnt in the reformer as fuel.

Distillation of the methanol to a chemical-grade (high purity) standard requires heat energy, partly supplied from the reformer process. Purge gases and liquids from the distillation process are recovered for further distillation, with any residues ("fusel oil") being burnt as fuel.

Initiatives to improve energy efficiency undertaken by Methanex have included communication sessions with shift workers to identify energy saving opportunities in addition to constant monitoring of energy performance.

2.1.3 Solid waste

Sludge from the clarifiers has been removed periodically, while the only opportunity to clean and remove sludge from the blowdown pond, cooling tower sump and off-spec pond is when the entire site is shutdown, as these facilities are in constant use. Sludge from the Waitara Valley cooling tower basin was removed and disposed of to sludge lagoon 1 in October 2018 during the Waitara Valley shutdown.

The solid wastes generated on site are placed in contained areas and are allowed to dry prior to disposal. The dried sludge and on occasion spent catalyst and resin, have in the past been disposed of to land in a consented area owned by Methanex just outside the boundary fence, northwest of the Motunui site.

Three of the four sludge lagoons are used to dewater river silt from the clarifiers. This sludge is kept separate from other more contaminated material (for example the solid waste cleaned from the other effluent ponds and spent ion exchange resins) so that it can be disposed of more easily. The lagoons have a large storage capacity and therefore disposal of dewatered sludge will occur on an infrequent basis.

2.2 Results

2.2.1 Site inspections

Site inspections are an important part of the monitoring programme, allowing discussion of Methanex's resource consents and relevant environmental issues. A Council report is written following each site inspection.

Council officers carried out four compliance monitoring site inspections on 6 September, 20 November 2018, 20 February, 09 April 2019 as well as two compliance monitoring sampling visits for the purpose of collecting a split sample on 17 October 2018 and 12 June 2019.

During the compliance monitoring site visits, various areas of the site were observed. This typically included inspecting the ponds and sludge lagoons, the containment and associated bunding, the cooling towers, the utilities area, the flare, the water/effluent treatment area and the stormwater discharge points to waterways either side of the Motunui site. Council officers inspected these areas for any apparent discharges, infrastructure issues/damage or potential risks.

The condition of any detectable emissions to air was also noted at each inspection, with particular reference to the cooling tower and the reformer.

06 September 2018

An inspection was carried out at the intake structures on the Waitara River and at both Methanex sites. The inspections were undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The Motunui site was inspected first and the following observations were made.

Overall the site was managed well with no off-site emissions or discharges detected. Routine maintenance on the plant was underway at the time of the inspection and it was noted that both production units were operational.

The Motunui water intake was also inspected. The intake facilities were noted to be in a tidy and good condition.

20 November 2018

An inspection of both the Motunui and Waitara Valley facilities was undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The Motunui site was inspected first and the following observations were made.

A minor leak of cooling water from eastern side panel was noted by Methanex personnel during the inspection (estimated <2 l/s, collecting on the gravel pad). No discharge to storm drains or runoff was evident. Maintenance had been alerted earlier that day, and repairs were scheduled to be carried out as soon as possible. It was subsequently confirmed that the repair was undertaken on the same day. Overall the site was managed well with no off-site emissions or discharges detected.

20 February 2019

An inspection of the Motunui and Waitara Valley facilities, as well as the intake structures was undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The Motunui site was inspected first and the following observations were made.

The site was found to be well managed with no off-site emissions or discharges detected.

The area of the cooling tower where the leak had previously been detected was inspected and found to be in good condition with no further leakage.

The intake facility and associated structures were found to be in a good and tidy condition.

09 April 2019

An inspection was carried out at the Methanol plants and Waitara Valley intake structure. The inspection was undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The Motunui site was inspected first and the following observations were made.

Overall the site was managed well and was tidy, with no off-site emissions or discharges detected.

It was noted that there were works planned at Motunui intake in the following days.

2.2.2 Surface water

2.2.2.1 Surface water abstraction monitoring by Methanex

Consent 0820-2 to take water from the Waitara River requires abstraction rates of less than 1,400 m³/hr. All records provided by Methanex for the Motunui abstraction, show rates below the allowable maximum level.

Consent 0820-2 specifies that no water may be taken when the flow of the Waitara River at the Bertrand Road gauging station falls below 4,600 l/s. The Waitara River fell below this level for short periods during February and March 2019. Appendix II shows the hydrographs for the Waitara River at Bertrand Road for the monitoring period. The first graph shows the whole monitoring year, while the second shows a zoomed in

view of when the consent limit was reached. Production continued through this period, with permission received from the Water Shortage Event Manager. Consideration was given to the extent to which the river level had fallen, the accuracy of flow gauges (margin of error) and weather forecasts. Given the short duration and that the Waitara River remained close to the 4,600 l/s cut off, environmental effects of the continued abstraction were unlikely to have any significant additional impact on the river.

Water use reduction report

The Council received a report from Methanex in September 2018 relating to water use reduction at the Motunui site during the 2016 and 2017 calendar years. The report is included as Appendix III to this report. This biennial water use reduction report is a requirement of condition 4b of Consent 0820-2 (Motunui). In the report, Methanex note that their consumption of water on average is only 64% of the consented amount. The relatively low water use is attributed to efficient operation of the plant made possible by significant maintenance operations recently undertaken. Increased demineralisation run lengths for regeneration was another process that decreased water consumption. The next water use reduction report is due before the end of 2020.

Pipeline integrity report and the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010

Condition 4 of Consent 0820-2 requires that Methanex undertake testing of the intake to the site every five years to establish pipeline integrity. This work was due to be completed during 2013. Methanex have investigated methods to undertake this effectively without damaging the existing infrastructure. They have remained in regular communication with Council on this matter, however have not been able to satisfy this condition of their consent. The Council is aware of the practical issues around achieving this and have indicated that if verified flow meters at both the sites and the point of take read in agreement, then this could provide a method to establish the integrity of the pipeline.

In September 2018, Methanex had submitted a report on the inspection (by videoscope) of the raw water pipeline's integrity. This testing provided a good indication that the state of repair of the water pipelines was good. The report is included as Appendix IV.

Methanex installed the water meter and provided a verification report to the Council during the previous monitoring period. During this monitoring period, Methanex met the requirements of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

Further discussion on the background of these issues is provided in the previous monitoring programme annual report (Technical Report 2017-104).

2.2.2.2 Effluent monitoring

During July 2018 to June 2019 the Motunui site was operating continuously, although refurbishment works meant that for short periods of time one of the two reformer units were not operating.

Effluent monitoring data gathered by Methanex was sent to the Council on a monthly basis. The data is made up of continuous online data, laboratory analysis of a 24-hour composite effluent sample and mass discharge of water treatment chemicals calculated by Methanex using chemical consumption data.



Photo 2 The Motunui site's blow down pond (decommissioned flare 2 can be seen in the background)

Continuous measurement

Flow and pH are measured by online analysers, and recorded continuously. The figures reported to the Council are daily averages (m^3/hr), daily maximum (l/s) and daily volume (m^3/day) for flow, and minima, maxima and daily averages for pH. A summary of the outfall effluent data is presented in Table 3.

Table 3 Summary of the Motunui site's monitoring results of plant effluent during 2018-2019

| Consent 3400-2 | Unit | Minimum | Maximum | Consent limit | Number of breaches |
|-------------------------------|-------------------------|---------|---------|---------------|--------------------|
| Continuous measurement | | | | | |
| Flow (daily average) | m^3/day | n/a | 7,909 | 12,096 | 0 |
| pH | - | 6.0 | 8.8 | 6-9 | 0 |
| Daily measurement | | | | | |
| Chemical oxygen demand | g/m^3 | <25 | 76 | 200 | 0 |
| Methanol | g/m^3 | <2 | <2 | 15 | 0 |
| Suspended solids | kg/day | <3 | 114 | 500 | 0 |
| Petroleum hydrocarbons | g/m^3 | <1 | <1 | 10 | 0 |
| Monthly measurements | | | | | |
| Copper | g/m^3 | <0.05 | 0.19 | 0.50 | 0 |
| Nickel | g/m^3 | <0.10 | <0.10 | 1.00 | 0 |
| Zinc | g/m^3 | <0.10 | 0.23 | 1.00 | 0 |

A proportional sampler is used to create a daily composite sample representative of the daily flow of Motunui effluent. This is analysed by the Methanex laboratory, to determine compliance with their discharge consent 3400-2. A summary of this data is included in Table 3 above.

On numerous occasions a visual check of the effluent sample indicated hydrocarbons were present (as a visible film), however subsequent sampling showed that the hydrocarbon concentrations were within consent limits.

Chemical dosing rates

Consent 3400-2 (for discharge of process waste from the Motunui site) sets mass discharge limits on the water treatment chemicals used on the site. Methanex calculates water treatment chemical mass discharge rates using chemical consumption data. A summary of this data for the monitoring period is presented in Table 4.

Table 4 Summary of Motunui chemical discharge data (calculated) for July 2018 to June 2019

| Consent 3400-2 (special condition 8) | | | | | |
|--------------------------------------|--------|---------|---------|---------|---------------|
| Chemical | Unit | Minimum | Maximum | Average | Consent Limit |
| Betz Dearborn AE1115 | kg/day | 21 | 38 | 25 | 60 |
| Cortrol OS 5601 | kg/day | 17 | 26 | 22 | 200 |
| Cortrol OS 7780 | kg/day | 17 | 39 | 28 | 400 |
| Flogard MS6209 | kg/day | 3 | 37 | 18 | 40 |
| Foamtrol AF2290 | kg/day | 0 | 0 | 0 | 40 |
| Gengard GN8020 | kg/day | 27 | 115 | 82 | 300 |
| Inhibitor AZ8104 | kg/day | 55 | 106 | 83 | 300 |
| Klairaide PC 1190P | kg/day | 56 | 157 | 96 | 600 |
| Optisperse HTP 7330 | kg/day | 15 | 52 | 30 | 120 |
| Optisperse HTP 73611 | kg/day | 13 | 89 | 37 | 120 |
| Spectrus BD1501E | kg/day | 5 | 32 | 10 | 70 |
| Spectrus NX1100 | kg/day | 6 | 34 | 15 | 65 |
| Steamate NA0880 | kg/day | 1 | 29 | 22 | 40 |

There were no breaches in chemical dosing limits during the monitoring period at this site.

Equivalent chemical

During the 2018-2019 monitoring period, there were no requests received to change water treatment chemicals as per the process set out in consent 3400-2.

Marine outfall report

A report on the structural integrity of the Waitara marine outfall was received from Methanex on 3 February 2014. This is a requirement of special condition 19 of Consent 3400-2. OCEL consultants had been contracted by NPDC to inspect and maintain the structure. Significant maintenance of the structure took place in 2012 and 2013 following the OCEL report finding various potential risks associated with the structural integrity of the outfall and its ability to resist the impact of a 100 year environmental event. Work undertaken to address the issues has included the removal of tube worm growth and the replacement of tie-down straps. A modelling exercise was carried out to determine the dilution performance of the outfall which was found to be within compliance limits as per special condition 4 of Consent 3400-2. The next report will be due upon request by the Council. This report has not as yet been requested.

Contingency plan

In accordance with consent 3400-2 and 0822-2, Methanex is required to maintain a comprehensive contingency plan for the Motunui site, which would be put into operation in the event of spillages, accidental discharges or pipeline failure. Methanex provided a revised plan including a 'Specific Response Procedure', a 'Notification of Environmental Exceedances Procedure', and a 'Reporting of Environmental Exceedances Procedure' for the Motunui site in November 2009. These spill contingency planning documents were found to be satisfactory. Consent 3400-2 requires revision of the spill contingency planning every two years. Methanex provided a revision of their contingency plan in June 2010, May 2012, September 2014, November 2016 and January 2018. These contingency plans were reviewed by Council officers and found to be satisfactory. The next review is expected in early 2020.

2.2.2.3 Uncontaminated stormwater

Stormwater outlets for uncontaminated stormwater are situated in the Waihi catchment on the eastern side of the Motunui site and at the sea cliff via the 'Duck Pond' on the north western side of the site (Figure 1).



Photo 3 The Duck Pond sampling point at the Motunui site



Photo 4 The Waihi Stream sampling point at the Motunui site

Weekly grab samples of the stormwater discharges were taken and analysed for four water quality characteristics by Methanex staff. The two sampling sites are shown in Photo 3 and Photo 4. The analytical sample results provide an indicator as to whether or not the discharge was contaminated. The results of the Methanex stormwater monitoring for July 2018 to June 2019 are summarised in Table 5 below.

Table 5 Summary of Motunui stormwater monitoring data for 2018-2019

| Consent 0822-2 | | | | | |
|------------------------|------------------|-------------------|-----------------|----------|-----------------------------|
| Parameter | Unit | Minimum | Maximum | Average* | Consent limit/ Guideline |
| Duck Pond (photo 3) | | | | | |
| pH | - | 6.6 | 7.6 | 6.97 | 6 - 9.5 |
| Petroleum hydrocarbons | g/m ³ | N/A | <1 | N/A | <5 |
| Conductivity at 25°C | µs/cm | 26.0 | 116.0 | 92.7 | <300 * |
| Total suspended solids | g/m ³ | <6 | 35.0 | 7.9 | <100 |
| Visual hydrocarbons | # Pass / # Fail | Tests passed: All | Tests failed: 0 | ---- | PASS |
| Waihi Stream (photo 4) | | | | | |
| pH | - | 6.3 | 9.0 | 6.6 | 6 - 9.5 |
| Petroleum hydrocarbons | g/m ³ | N/A | <1 | N/A | <5 |
| Conductivity at 25°C | µs/cm | 33.0 | 212.0 | 117.7 | <300 * |
| Total suspended solids | g/m ³ | <6 | 140 | 3.36 | <100 |
| Visual hydrocarbons | # Pass / # Fail | Tests passed: All | Tests failed: 0 | ---- | PASS |

* Guideline value, not a consent requirement.

Duck Pond discharge

The quality of the stormwater discharge from the Duck Pond was within the agreed guideline or consent limits for uncontaminated stormwater on each monitoring occasion.

Waihi Stream

With the exception of total suspended solids, the stormwater samples analysed from the Waihi Stream monitoring site were within agreed limits required by the consent. This high suspended solids result was associated with the entrainment of sediment in samples that were collected under low flow, stagnant conditions (there was no discharge occurring at the time of sampling) and therefore is not representative of the actual stormwater discharge quality.

2.2.2.4 Inter-laboratory comparisons

On the 17th of October 2018 and 12th of June 2019, the Council and Methanex undertook an inter-laboratory comparison. Samples were collected from the composite outfall sampler and from two sites representing the effects of Motunui site's stormwater discharges on surface water. The results of the inter-laboratory comparisons, which also serve the purpose of compliance monitoring checks, are shown in Table 6 and Table 7. Results from both laboratories for the Motunui effluent samples met the consent limits during the monitoring period. A comparison of the laboratory results showed there were some minor variation in values determined by the laboratories.

Table 6 Inter-laboratory comparison of Motunui outfall composite sample results

| Parameter | Unit | Consent limits | 17 October 2018 | | 12 June 2019 | |
|------------------------|-------|------------------------|-----------------|---------|--------------|-------|
| | | | Methanex | TRC | Methanex | TRC |
| Chemical oxygen demand | mg/l | 200 | 26 | 22 | 31 | 30 |
| Conductivity @ 25 °C | µs/cm | | 1,680 | 1,661 | 1,890 | 1,865 |
| Copper – acid soluble | mg/l | 0.5 | 0.12 | 0.12 | <0.05 | 0.016 |
| Methanol | mg/l | 15 | <2 | < 2 | <2 | - |
| Nickel – acid soluble | mg/l | 1.0 | < 0.010 | < 0.010 | <0.10 | <0.01 |
| pH | | 6.0-9.0 | 7.5 | 7.3 | 8.0 | 8.1 |
| Total hydrocarbons | mg/l | 10 | < 1 | < 4 | <0.1 | - |
| Total suspended solids | mg/l | daily discharge <500kg | < 6 | < 3 | <6 | 3 |
| Turbidity | NTU | | 4.4 | - | 2.9 | - |
| Zinc – acid soluble | mg/l | 1.0 | 0.13 | 0.14 | <0.10 | 0.06 |

Table 7 Results of Motunui stormwater inter-laboratory comparison between Methanex and the Council

| Motunui site stormwater (Consent 0822-2) | | | | | | |
|--|-------|----------------|-----------------------|-----|--------------------------|-----|
| Parameter | Unit | Consent limits | Duck Pond (STW002012) | | Waihi Stream (STW002013) | |
| | | | Methanex | TRC | Methanex | TRC |
| 17 October 2018 | | | | | | |
| Conductivity @ 25°C | µs/cm | 300* | 105 | 102 | 145 | 144 |
| pH | | 6.0-9.5 | 7.6 | 7.4 | 7.3 | 7.4 |

| Motunui site stormwater (Consent 0822-2) | | | | | | |
|--|-------|----------------|-----------------------|--------|--------------------------|-------|
| Parameter | Unit | Consent limits | Duck Pond (STW002012) | | Waihi Stream (STW002013) | |
| | | | Methanex | TRC | Methanex | TRC |
| Total hydrocarbons | mg/l | 5 | < 1 | < 0.7 | < 1 | < 0.7 |
| Total suspended solids | mg/l | 100 | 12 | 12 | < 6 | 6 |
| Zinc | mg/l | | - | < 0.02 | 0.23 | 0.23 |
| Turbidity | NTU | | 14 | - | 3.0 | - |
| 12 June 2019 | | | | | | |
| Conductivity @ 25°C | µs/cm | 300* | 112 | 111 | 102 | 101 |
| pH | | 6.0-9.5 | 6.8 | 6.9 | 6.6 | 6.8 |
| Total hydrocarbons | mg/l | 5 | <1 | - | <1 | - |
| Total suspended solids | mg/l | 100 | <6 | 3 | <6 | <3 |
| Zinc | mg/l | | - | <0.02 | 0.24 | 0.25 |
| Turbidity | NTU | | 4.6 | - | 3 | - |

* Not a consent limit, but a guideline limit

For these sampling events, the results from each laboratory for stormwater discharges met the consented water quality criteria.

Overall there was good agreement between the inter-laboratory analytical sample results.

2.2.2.5 Methanex Motunui annual report

Condition 20 of consent 3400-2 requires Methanex to provide the Council with an annual report on its wastewater treatment and disposal system, including monitoring results of the discharge and compliance with the consent.

Annual reports for July 2018 to June 2019 were received by Council via monthly reports, and fulfil this consent requirement.

2.2.3 Air

2.2.3.1 Inspections

During the 2018-2019 monitoring period the Council received no complaints in regard to air pollution from the Motunui site.

During site inspections, Council officers also inspect for air discharges such as odour and smoke around the Motunui site. No discharges were recorded during any of the inspections.

2.2.3.2 Consent requirements

Plume abatement report

Condition 5 of resource consent 4042-3 required a report, outlining options for reducing the adverse effects of the cooling tower plume. The consent specified that these reports should be provided in February 2009 and every five years thereafter. The most recent report was received in October 2014.

The report was discussed and included as an Appendix in the 2014-2015 Motunui and Waitara Valley Combined Annual Report. The next report is due towards the end of 2019.

Biennial air emissions report

Condition 6 of consent 4042-3 requires Methanex to provide the Council with a biennial report on its air emissions, including a revision of any technological advances in the reduction or mitigation of emissions, a detailed inventory of emissions (excluding carbon dioxide), outlining any energy efficiency measures, and addressing any other issues relevant to minimisation or mitigation of emissions.

A biennial report covering the period January 2016 to December 2017 was received in September 2018. The report is included as Appendix V to this Annual Report.

The report showed compliance with the ground level concentration limits for methanol, carbon monoxide and nitrogen dioxide. The report discussed energy efficiency measures at Motunui including refurbishment of the cooling tower (with an associated energy efficiency improvement of 17%) and the installation of desulphurisation catalyst and preheaters in the reformer.

The next biennial report covering the 2018 and 2019 calendar years is due in 2020, and will be discussed in the 2020-2021 compliance monitoring report.

2.2.4 Soil

Presently the sludge lagoons collect river silt that has been backwashed from the clarifiers. Infrequently, these sludge lagoons are cleaned out and spread to Motunui farmland as permitted by Rule 29 of the Regional Freshwater Plan.

2.2.5 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 consent holder. 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).

In the 2018-2019 monitoring period there were four events (two confirmed as a minor non-compliance) that required follow-up recorded by the Council that were associated with Methanex's Motunui site.

Consent condition limit exceedance: Copper

A consent condition exceedance was raised in relation to a self-notification received from Methanex personnel. This incident was reported to the Council on 18 September 2018. Due to an operational issue with the plant on Thursday 13th, catalyst dust was entrained in the crude methanol which was then distilled. The dust accumulated in the distillation bottoms (water) which is disposed of via the marine outfall.

Methanex stopped export to the outfall immediately when this became known and analysed the 24 composite sample for copper and zinc (these being components of the catalyst). The results found that there was an exceedance in the copper concentration:

Cu: 1.0 mg/L (limit of 0.5 exceeded)

Zn: 0.83 mg/L (limit 1.0)

Due to the significant dilution through the marine outfall and the very short duration of the discharge, the environmental impact of the discharge was considered negligible. Methanex resolved the issue immediately and as it related to mechanical failure, no further action was considered necessary.

Cooling water discharge

As discussed in the inspection summary of 20 November 2018, a minor leak of cooling water was discovered. There was no discharge to stormwater and the leak was immediately repaired.

Stormwater consent limit exceedance: suspended solids

In data supplied by Methanex a consent limit exceedance for suspended solids was noted. The Waihi Stream sample returned a suspended solids result of 140 mg/l; the consent limit is 100 mg/l. Methanex provided further information on the sampling noting that due to preceding dry weather, the stream was stagnant at the time of sampling. Therefore the sample is not representative of the stormwater discharge, as no discharge was occurring at the time of sampling, and it was also likely that due to low water levels, bed sediment may have been entrained with the sample.

Consent limit breach: Water take

As discussed in section 2.2.3.1 of this report, during February and March 2019, the Waitara River fell below the cut-off point of 4,600 l/s. Methanex continued production following consultation and permission being received from the Council's Water Shortage Event Manager who gave consideration to the extent to which the river level had fallen, the accuracy of flow gauges (margin of error) and weather forecasts.

Table 8 Incidents, investigations, and interventions summary table

| Date | Details | Compliant (Y/N) | Enforcement Action Taken? | Outcome |
|----------|---|-----------------|--|---|
| 18/09/18 | Catalyst contamination of wastewater | N | No - due to mechanical failure, Defence under Section 341 (2) (b) of the RMA | Export of effluent ceased immediately until matter was resolved. Likely environmental effects - negligible. |
| 20/11/18 | Minor leak of cooling water (estimated <2L/s, collecting on the gravel pad). No discharge to storm drains or runoff was evident. A repair was undertaken on the same day. | Y | No | Spill was managed before it made its way to stormwater. |

| Date | Details | Compliant (Y/N) | Enforcement Action Taken? | Outcome |
|----------------|---|-----------------|---------------------------|---|
| 11/12/2018 | Exceedance of suspended solids stormwater discharge consent limit | Y | No | It was noted that the sample was collected despite there being no stormwater discharge at the time of sampling. Low water level was likely to have resulted in entrainment of bed sediment with the sample. |
| Feb & Mar 2019 | Consent breach: water taken when the Waitara was below 4,600 l/s | N (notional) | No | Over a short period during February and March, the river level fell below the 4,600 l/s level. The consent holder consulted with the Water Shortage Event Manager and were given permission to continue production. |

2.3 Discussion

2.3.1 Discussion of site performance

Previous high standards of housekeeping were apparent at all inspections undertaken at the Motunui site. The Motunui site is presently running at full capacity with both production units on line. Maintenance and improvements of the site have been undertaken during the period under review.

Methanex continued to manage consented activities well within consent limits over this monitoring period. Methanex has a current contingency plan with respect to the operation of the wastewater consent at the Motunui site. Methanex maintains comprehensive spill contingency equipment on site, and personnel are trained with respect to spill response.

Production related emissions to air from the site continued during the period under review. No consent non-compliances were noted and no complaints were received regarding flaring or the cooling tower plumes.

2.3.2 Environmental effects of exercise of water abstraction permits

The Motunui consent allows for a water take of up to 1,400 m³/hr. Typically the water take is much lower, in the region of 1,000 m³/hr. In part, this is due to the water reduction initiatives instigated by Methanex. At certain stages of the monitoring year, only one of the two production units were operating, so reducing water demand considerably over those periods.

Methanex personnel have been in ongoing discussion with the Council on attaining compliance with the national water abstraction regulations and their consent conditions in regard to water take pipeline integrity and flow meter positioning and verification issues. During the previous monitoring year Methanex installed and verified flowmeters at the point of take for both sites. They are presently compliant with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*.

Methanex submitted a report titled Raw-water Pipeline's Integrity during September 2018. The report provides evidence of the Pipeline's integrity from the Tikorangi Road intake to the Motunui plant. The inspection was undertaken by Core Group on behalf of Methanex, using video scope. The inspection of the pipeline was limited to the vicinity of a number of valves located along the pipeline and therefore the report relates to spot inspections rather than a comprehensive inspection along the full length of the pipeline. The pipeline was found to be in satisfactory condition around the areas inspected. It is not likely that the pipeline is significantly leaky and it is expected that any environmental effects associated with this issue would be minimal and therefore the non-compliance with this consent condition is largely administrative.

2.3.3 Environmental effects of exercise of water discharge permits

Methanex staff continued to provide the Council with monthly monitoring data. The parameters measured were all found to comply with consented limits for the water discharge consents held.

Inter-laboratory comparisons between the Council and Methanex laboratories showed good agreement of results.

No visible environmental effects in any of the receiving watercourses were recorded during the site inspections.

2.3.4 Environmental effects of exercise of air discharge permits

The controls that Methanex have in place to minimise and mitigate the safety risks, in regard to air emissions, to site operators also ensures that there is a low likelihood of adverse environmental effects offsite. Modelling of air emissions when the site was at full capacity in 2001 has shown emissions levels far below consent limits which are set in line with National Environmental Air Quality Standards.

Neighbourhood effects

No offensive or objectionable odours were noted at the site boundary during any site visit undertaken by Council staff. Furthermore the Council has not received any specific complaints regarding the cooling tower plume through the monitoring period under review.

Ecological effects

No adverse environmental effects were detected during the period under review.

2.3.5 Evaluation of performance

A tabular summary of Methanex's compliance record under its current active consents for the 2018-2019 monitoring year is set out in Table 9 to Table 14.

Table 9 Summary of performance for Consent 0820-2

| Purpose: To take water from Waitara River | | |
|--|---|---|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. The volume taken shall not exceed 1,400 m ³ /hr | Daily maximum flow rates provided monthly | Yes |
| 2. The taking of water is managed to ensure that river flow no less than 4,600 l/s | Continuous gauging at Bertrand Road | No – Permission received to continue production from Water Shortage Event Manager |

| Purpose: To take water from Waitara River | | |
|---|---|---|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 3. Installation and maintenance of a water meter for water take data | Monthly data reports provided | Yes |
| 4. Water conservation measures– incl. five-yearly testing of pipeline integrity and two-yearly report on water conservation | Water conservation reports received May 2016. Pipeline testing is overdue. Methanex and Council have been in discussion on how best to achieve this | Water conservation report received Pipeline testing report on hold through discussion with Council |
| 5. Appropriate screening of intake structure to prevent fish entrainment | Inspection and liaison with consent holder | Yes |
| 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 10 Summary of performance for Consent 0822-2

| Purpose: To discharge of stormwater from outfalls into Waihi and Manu Streams | | |
|--|--|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Adoption of best practicable option to minimise effects | Inspection and liaison with consent holder | Yes |
| 2. Limitation on stormwater catchment area – specific to application refer to drawing g10637 | Inspection and liaison with consent holder | Yes |
| 3. Contingency plan to be maintained and followed in event of a spill. Contingency plan to be supplied to the Council | Contingency plan received and reviewed in December 2014. Methanex reviewed plan and supplied to the Council in 2018 | Yes |
| 4. Stormwater management plan to be maintained. To be supplied to the Council and approved | Stormwater management plan received and reviewed | Yes |
| 5. Discharge sample analysis. Sampling to occur at specified points from the Waihi Stream and the Duck Pond. Analysed for pH, TSS and total recoverable hydrocarbons | Sample analysis results received. With the exception of two TSS results, these were within consent limits. The exceedance in TSS was attributed to sampling under stagnant conditions which likely resulted in the inclusion of bed sediment with the sample and therefore was not considered representative of the actual water quality as discharged | Yes |
| 6. Manu Stream: Discharge cannot cause specified adverse effects beyond mixing zone | Inspection – observation. Receiving water sample analysis | Yes |

| Purpose: To discharge of stormwater from outfalls into Waihi and Manu Streams | | |
|---|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 7. Waihi Stream: Discharge cannot cause specified adverse effects beyond mixing zone | Inspection – observation. Receiving water sample analysis | Yes |
| 8. The Council is to be notified of any changes that may affect the nature of the discharge | No notification received | Yes |
| 9. Review of consent | Next scheduled 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 11 Summary of performance for Consent 0825-3

| Purpose: To discharge of stormwater from Motunui intake facility into Waitara River unnamed tributary | | |
|--|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Best practicable option to prevent and minimise adverse effects | Discussion with consent holder | Yes |
| 2. Activity undertaken in accordance with application documentation | Liaison with consent holder | Yes |
| 3. Discharge cannot cause specified increase in turbidity in Waitara River beyond the mixing zone | Liaison with consent holder | Yes |
| 4. Lapse of consent | Consent given effect to | N/A |
| 5. Review of consent | No further provision for review | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent | | High |
| Overall assessment of administrative performance in respect of this consent | | High |

N/A = not applicable

Table 12 Summary of performance for Consent 0827-3

| Purpose: To discharge wastewater from the Motunui in-take facility into Waitara River unnamed tributary | | |
|--|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Maximum daily discharge shall not exceed 1,000 m ³ /day | Liaison with consent holder | Yes |
| 2. Adoption of best practicable option | Ongoing liaison with consent holder | Yes |

| Purpose: To discharge wastewater from the Motunui in-take facility into Waitara River unnamed tributary | | |
|--|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 3. Activity undertaken in accordance with application documentation | Liaison with consent holder | Yes |
| 4. Discharge cannot cause specified adverse effects on turbidity in Waitara River beyond the mixing zone | No incidents reported. Liaison with consent holder | Yes |
| 5. Review of consent | No further provision for review | 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 13 Summary of performance for Consent 3400-2

| Purpose: To discharge effluent and stormwater into Tasman Sea | | |
|---|--|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Consent holder to adopt best practicable option to prevent or minimise adverse effects | Inspections, liaison and review of reported data. Methanex self-reported two incidents that resulted due to refurbishment work undertaken on their wastewater pipeline and cooling towers. In both cases the discharge to stormwater was promptly resolved and minimal environmental effects were considered likely as a result of the discharges. | Yes |
| 2. Consent holder to maintain a record of the volume of effluent discharged each day | Monthly reports provided | Yes |
| 3. Maximum daily discharge 12,096 m ³ /day, 140 l/s | Monthly reports received | Yes |
| 4. Minimum initial dilution of effluent 100:1 | Outfall designed to specific design. Modelling exercise was undertaken and reported with the five-yearly marine outfall report received in February 2014 | Yes |
| 5. Maximum daily discharge of suspended solids 500 kg | Review of analytical information provided in self-monitoring data and inter-laboratory comparison | Yes |
| 6. pH not to exceed range of 6 to 9 | Review of analytical information provided in self-monitoring data and inter-laboratory comparison | Yes |
| 7. Limits on concentration of COD, hydrocarbons, methanol, copper, nickel, zinc | Review of analytical information provided in self-monitoring data and inter-laboratory comparison | Yes |

| Purpose: To discharge effluent and stormwater into Tasman Sea | | |
|--|--|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 8. Allowable water treatment chemicals and volumes | Liaison with consent holder and inspections | Yes |
| 9. Maximum daily limit of treatment with Spectrus CT1300 in response to Legionella | Liaison with consent holder and consent holder reports. This condition was not exercised during this monitoring period | N/A |
| 10. Approval from the Council required to discharge 'equivalent' chemical. | Not required during this monitoring period | N/A |
| 11. Definition of 'equivalent' | N/A | N/A |
| 12. Discharge of equivalent chemical requires written request | Not required | N/A |
| 13. Conditions 5,6,7 and 8 apply to effluent prior to entry into outfall line | Monitoring and sampling carried out with regard to this requirement | Yes |
| 14. Limits in conditions 7 and 8 apply unless the Council has given approval for a short term change | Not required | N/A |
| 15. Effects on receiving waters | Historical marine ecological surveys (separate programme) | Yes |
| 16. Consent holder to maintain contingency plan | Updated contingency plans provided January 2018 and reviewed as satisfactory | Yes |
| 17. No domestic sewage in discharge | Liaison with consent holder. Domestic sewage is routed to the WWTP, not directly to the outfall | Yes |
| 18. Consent holder to notify the Council at least seven days before consent is first exercised | Notification on file | Yes |
| 19. Consent holder to certify the structural integrity and dilution performance of outfall at least every five years | Received a report satisfying this requirement | Yes |
| 20. Consent holder to supply an annual effluent report by 31 March each year | Reports received monthly and reviewed as satisfactory | Yes |
| 21. Lapse of consent | Consent given effect to | N/A |
| 22. Review of consent | No further provision for review | 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 14 Summary of performance for Consent 4042-3

| Purpose: To discharge emissions into the air – methanol distillation and ancillary facilities | | |
|--|--|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Adoption of best practicable option to minimise adverse effects | Inspection and liaison with consent holder | Yes |
| 2. Minimisation of emissions through control of processes | Inspection and liaison with consent holder | Yes |
| 3. Consultation and approvals required prior to alterations to plant or processes | Inspection and liaison found no alterations to plant or processes requiring additional approvals | Yes |
| 4. Provision of a report on cooling tower plume abatement | Report received October 2014. Next report expected in 2019 | Yes |
| 5. Biennial written air discharge emission and mitigation reports | Received September 2018. Next report expected in 2020 | Yes |
| 6. Maximum ground-level concentrations of methanol beyond site boundary | Previous modelling has shown compliance when site in full operation | Yes |
| 7. Maximum ground-level concentrations of carbon monoxide beyond boundary | Previous modelling has shown compliance when site in full operation | Yes |
| 8. Maximum ground-level concentrations of nitrogen dioxide beyond boundary | Previous modelling has shown compliance when site in full operation | Yes |
| 9. Maximum ground-level concentrations of other contaminants beyond boundary | Previous modelling has shown compliance when site in full operation | Yes |
| 10. Inventory of emissions to be provided with biennial emission mitigation report | Received September 2018. Next report expected in 2020 | Yes |
| 11. No offensive or objectionable odour at the site boundary permitted | Inspection | Yes |
| 12. Adverse effects on ecosystems not permitted | Inspection of surrounding environment found no adverse effects | Yes |
| 13. Optional review provision – notification within 6 months of receiving report (condition 5) | Consent was reviewed as part of the renewal process – 4042-3, granted 12 February 2008 | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent | | High |
| Overall assessment of administrative performance in respect of this consent | | High |

N/A = not applicable

Table 15 Evaluation of environmental performance over time

| Year | Consent no | High | Good | Improvement req | Poor |
|-----------|------------|------|------|-----------------|------|
| 2013-2014 | 0820-2 | 1 | | | |
| | 0822-2 | 1 | | | |
| | 0825-3 | 1 | | | |
| | 0827-3 | 1 | | | |
| | 3400-2 | 1 | | | |
| | 4042-3 | 1 | | | |
| 2014-2015 | 0820-2 | 1 | | | |
| | 0822-2 | 1 | | | |
| | 0825-3 | 1 | | | |
| | 0827-3 | 1 | | | |
| | 3400-2 | 1 | | | |
| | 4042-3 | 1 | | | |
| 2015-2016 | 0820-2 | 1 | | | |
| | 0822-2 | 1 | | | |
| | 0825-3 | 1 | | | |
| | 0827-3 | 1 | | | |
| | 3400-2 | 1 | | | |
| | 4042-3 | 1 | | | |
| 2016-2017 | 0820-2 | 1 | | | |
| | 0822-2 | 1 | | | |
| | 0825-3 | 1 | | | |
| | 0827-3 | 1 | | | |
| | 3400-2 | 1 | | | |
| | 4042-3 | 1 | | | |
| 2017-2018 | 0820-2 | 1 | | | |
| | 0822-2 | 1 | | | |
| | 0825-3 | 1 | | | |
| | 0827-3 | 1 | | | |
| | 3400-2 | 1 | | | |
| | 4042-3 | 1 | | | |
| 2018-2019 | 0820-2 | 1 | | | |
| | 0822-2 | 1 | | | |
| | 0825-3 | 1 | | | |
| | 0827-3 | 1 | | | |
| | 3400-2 | 1 | | | |

| Year | Consent no | High | Good | Improvement req | Poor |
|--------|------------|------|------|-----------------|------|
| | 4042-3 | 1 | | | |
| Totals | | 36 | 0 | 0 | 0 |

In assessing a compliance and environmental performance ranking for Methanex, consideration was also given to the incidents that occurred during the monitoring period as well as overall environmental performance and risk management. During the period, Methanex demonstrated an overall high level of both environmental and administrative performance and compliance with the resource consents for the Motunui installation as defined in Section 1.1.4.

2.4 Recommendations from the 2017-2018 Annual Report

In the 2017-2018 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at the Methanex Motunui site in the 2018-2019 year continues at the same level as in 2017-2018.
2. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT Methanex continue with investigations on the required testing to establish water intake pipeline integrity at intervals of at least every five years and that this either result in the undertaking of the required testing or a variation of consent conditions.

Recommendations 1 to 2 were fully implemented during the 2017-2018 monitoring period. There has been ongoing discussion and investigation between Methanex and the Council staff with regard to the five yearly water intake pipe integrity report. There are some complexities in determining the best method to undertake the required testing without damaging the existing infrastructure. This matter will be considered further during the process of renewing the consent in 2021.

2.5 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 2019-2020 monitoring of consented activities at Methanex Motunui continue at the same level as in 2018-2019.

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

2.6 Recommendations

1. THAT in the first instance, monitoring of consented activities at Methanex Motunui 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.

3 Waitara Valley

3.1 Process description

The Waitara Valley site had been shut down since 2008 and was restarted in October 2013 following significant maintenance and refurbishment work.

The Waitara Valley site (Photo 3) is a 1,500 tonne/day methanol production facility, which could produce 547,500 tonnes/year of chemical grade methanol. Actual production varies with the availability of natural gas.

Methanex Waitara Valley site is divided into several discrete areas associated with the on-site production of methanol (Figure 3).

The processing area includes the reformer, main compressor, and the distillation units (D1 & D2). The distillation towers are the tallest structures on the site at 51.5 metres, followed by the reformer stack at 38 metres. Product storage area consists of one substantial storage tank and six smaller tanks. A cooling tower and the main servicing facilities are located in the utility area. It is noted that the cooling tower technology in place at the Waitara Valley site differs from the system used at Motunui and the cooling tower is considerably smaller in size.



Photo 5 Methanex Waitara Valley site



Figure 3 Waitara Valley site layout and water sampling site location

3.1.1 Water discharges

There were various sources of wastewater from processes associated with the methanol manufacturing activities at the site, including water treatment wastes, boiler, cooling tower and other blowdowns, process effluents, domestic effluent and stormwater. The primary sources of water discharges, and the main features of the site are identified in Figure 3. This effluent is produced in a similar manner to that described in this report for the Motunui site (refer to section 2.1.1 of this report).

The Waitara marine outfall is the primary method used to dispose of stormwater and wastewater (excluding sewage) from the site.

Discharges to the Waitara River now occur very infrequently and only after consultation with Council. A small area of the site in the vicinity of the ponds and domestic wastewater treatment area flows overland to a small tributary of the river. A diesel tank in this higher risk area is bunded, and the sump under the diesel tank is sampled and tested prior to discharge.

3.1.2 Emissions to air

The principal emissions from the site were:

- a. flue gases from the reformer furnace stack. These comprise typical products from the combustion of natural gas i.e. water vapour, oxygen, carbon dioxide, and traces of nitrogen oxides and carbon monoxide;
- b. flue gases from the boiler stacks, which were similar to the above;
- c. steam emissions from various vents;
- d. water vapour and water droplets from the cooling tower, which could contain entrained water salts and treatment chemicals; and
- e. organic vapours (particularly methanol) from the distillation column vents.

3.1.3 Solid wastes

Solid wastes were previously generated at the site. The main source of this was sludge from the ponds. When the ponds were de-sludged, the material was allowed to dry on-site and tested so that the appropriate method of disposal could be determined.

3.2 Results

3.2.1 Site inspections

Council officers carried out four compliance monitoring site inspections on 6 September, 20 November 2018, 20 February and 9 April 2019 as well as one compliance monitoring sampling visit for the purpose of collecting a split sample on 12 June 2019.

06 September 2018

An inspection was carried out at the intake structures on the Waitara River and at both Methanex sites. The inspections were undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The following observations were made during inspection of the Waitara Valley site:

Overall the site was managed well and was found to be tidy with no off-site emissions or discharges detected. Methanex personnel advised that upgrades to the sewage treatment system's capacity was planned for next quarter.

The intake facilities were also inspected and were found to be in a good and tidy condition.

20 November 2018

An inspection of both the Motunui and Waitara Valley facilities was undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The Waitara Valley site was inspected after Motunui and the following observations were made.

The plant was shut down at the time of the inspection. Recent maintenance work included the replacement of cell panels and clearing sump, as well as the installation of new chemical storage containers (these being a mix of bunded and self-bunded models). The onsite sewage facility upgrades were complete. The soakage field has been extended as part of upgrade. It was found to be well vegetated with no sign of discharge effects. Sucker trucks were operating during shutdown, while the sewage system capacity was exceeded. The control room was still to be moved to new location. Used catalyst was stockpiled onsite, awaiting disposal.

20 February 2019

An inspection of the Motunui and Waitara Valley facilities, as well as the intake structures was undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The following observations were made during inspection of the Waitara Valley site:

Overall the site was well managed and tidy with no off-site emissions or discharges detected. Routine maintenance around the site was on-going.

The intake facilities were also inspected and were found to be in a good and tidy condition.

09 April 2019

An inspection was carried out at the Methanol plants and Waitara Valley intake structure. The inspection was undertaken by Council staff, accompanied by Ben Lawn (Methanex personnel). The Waitara Valley site was inspected after Motunui and the following observations were made.

The plant was in full shutdown with no gas onsite. Maintenance works were ongoing. Overall the site was managed well with no off-site emissions or discharges detected.

The intake facilities were also inspected and were found to be in a good and tidy condition. The upstream cellar was in the process of being cleaned out by sucker truck. No discharge to the river was occurring.

3.2.2 Production shutdowns

The following schedule of production unit shutdowns was received from Methanex Waitara Valley (Table 16).

Table 16 Programme of production unit shutdowns for
01 July 2018 to 30 June 2019

| Trip date | Restart date | Production unit |
|-----------|--------------|-----------------|
| 24-Sep-18 | 26-Sep-18 | Waitara Valley |
| 26-Sep-18 | 11-Oct-18 | Waitara Valley |
| 11-Oct-18 | 25-Nov-18 | Waitara Valley |
| 25-Nov-18 | 31-Dec-18 | Waitara Valley |
| 1-Jan-19 | 11-Jan-19 | Waitara Valley |
| 13-Jan-19 | 19-Jan-19 | Waitara Valley |
| 23-Feb-19 | 27-Feb-19 | Waitara Valley |
| 5-Mar-19 | 7-Mar-19 | Waitara Valley |

| Trip date | Restart date | Production unit |
|-----------|--------------|-----------------|
| 22-May-19 | 26-May-19 | Waitara Valley |
| 19-Jun-19 | 27-Jun-19 | Waitara Valley |

3.2.3 Surface water

3.2.3.1 Surface water abstraction monitoring by Methanex

Since 1992, water for operation of the Waitara Valley site has been supplied from headworks constructed for supply of the Methanex Motunui site. The headworks are located approximately one kilometre above the Bertrand Road bridge, and supplement the supply from the original Mamaku Road headworks.

Daily volumes of water entering the Waitara Valley site from the Waitara River are recorded and reported to the Council on a monthly basis.

Consent 0801-2 allows Methanex to take up to 300 m³/ hr from the Waitara River (Photo 6) when the river flow at the Bertrand Road gauging station is above 4,600 l/s (16,560 m³/hr). A hydrograph of river flows at the Bertrand Road gauging station based on data for calculated mean daily flows during the 2018–2019 monitoring period is attached to this report as Appendix II. The Waitara River flow fell for a short period below the consent limit of 4,600 l/s during February and March 2019. As discussed in Section 2 of this report, production continued through this period, with permission received from the Water Shortage Event Manager. The environmental effects of the continued abstraction were unlikely to have any significant additional impact on the river.

Reported maximum daily abstraction rates were within allowable limits at all times.



Photo 6 Waitara Valley water take

Water use reduction report

The Council received a report from Methanex in September 2018 relating to water use reduction at Waitara Valley during the 2016 and 2017 calendar years. This report is a requirement of condition 5b of Consent 0801-2. In the report, Methanex note that their consumption of water on average is only 58% of the consented amount. Similarly to Motunui, the relatively low water use is attributed to efficient operation of

the plant made possible by significant maintenance operations recently undertaken. Increased demineralisation run lengths for regeneration was another process that decreased water consumption. The next report is due before the end of 2020.

Resource Management (Measurement and Reporting of Water Takes) Regulations 2010

The installation and verification of the accuracy of the Waitara Valley site's raw water flow meter was undertaken during the previous monitoring period. The Council has reviewed and accepted the reports relating to this.

3.2.3.2 Effluent monitoring

Wastewater from the Waitara Valley site is treated and discharged to the Waitara marine outfall. During the period under review, treated plant effluent comprised process and water treatment wastes and stormwater. The discharge is provided for by consent 3399-2.

Effluent monitoring data gathered by Methanex was sent to the Council on a monthly basis. The data is made up of continuous online data, laboratory analysis of a 24-hour composite effluent sample and mass discharge of water treatment chemicals calculated by Methanex using chemical consumption data.

Continuous measurement

Flow and pH are measured by online analysers, and recorded continuously at the Waitara Valley effluent discharge point. The figures reported to the Council are daily averages (m³/hr), daily maximum (l/s) and daily volume (m³/day) for flow, and minima, maxima and daily averages for pH.

A summary of this data is presented in Table 17 and Table 18.

Special condition 6 of consent 3399-2 states,

"THAT the pH of the effluent shall not exceed the range pH 6 to pH 9 unless it is to be combined with the lime treated wastewater from the Waitara Wastewater Treatment Plant, in which case, it shall not exceed the range of pH 6 to pH 11."

As the WWTP ceased operation in August 2014, the pH values of 6 and 9 are used for assessing consent compliance.

Analysis of composite samples

A proportional sampler is used to create a daily composite sample representative of the daily flow of effluent. This is analysed by the Methanex laboratory, to determine compliance with their discharge consent 3399-2. A summary of this data is presented in Table 17.

Table 17 Summary of the Waitara Valley site's monitoring results of effluent during 2018-2019

| | Unit | Minimum | Maximum | Consent limit | Number of breaches |
|-------------------------------|---------------------|---------|---------|---------------|--------------------|
| Continuous measurement | | | | | |
| Volume of discharge | m ³ /day | 0 | 3,585 | 5,000 | 0 |
| pH | - | 6.0 | 9.2 | 6-11 | 0 |
| Daily measurement | | | | | |
| Chemical oxygen demand | g/m ³ | <25 | 63 | 200 | 0 |

| | Unit | Minimum | Maximum | Consent limit | Number of breaches |
|-----------------------------|------------------|---------|---------|---------------|--------------------|
| Petroleum hydrocarbons | g/m ³ | <1 | <1 | 10 | 0 |
| Methanol | g/m ³ | <2 | 7.0 | 15 | 0 |
| Suspended solids | kg/day | <3 | 126 | 500 | 0 |
| Monthly measurements | | | | | |
| Ammonia | g/m ³ | <0.01 | 7.2 | 200 | 0 |
| Copper | g/m ³ | <0.05 | 0.13 | 0.5 | 0 |
| Nickel | g/m ³ | <0.10 | <0.10 | 1.0 | 0 |
| Zinc | g/m ³ | <0.10 | <0.10 | 2.0 | 0 |

The effluent discharge rates are limited by consent 3399-2 to a daily discharge of not more than 5,000 m³ and at a maximum rate of 60 l/s. From the data provided by the consent holder, full compliance was maintained throughout the monitoring period with regard to this requirement.

All results were found to be within the consent limits.

Chemical dosing rates

Consent 3399-2 (for discharge of process waste from the Waitara Valley site) sets mass discharge limits on the water treatment chemicals used on the site. Methanex calculates water treatment chemical mass discharge rates using chemical consumption data. A summary of this data for the monitoring period is presented in Table 18.

Table 18 Summary of Waitara Valley chemical discharge data (calculated) for July 2018 to June 2019

| Consent 3399-2 (special condition 8) | | | | | |
|---|--------|---------|---------|---------|---------------|
| Chemical | Unit | Minimum | Maximum | Average | Consent Limit |
| Cortrol OS7780 | Kg/day | 0 | 37 | 11 | 300 |
| Flogard MS6209 | Kg/day | 0 | 2 | 1 | 20 |
| Foamtrol AF2290 | Kg/day | 0 | 0 | 0 | 2 |
| Gengard GN8020 | Kg/day | 0 | 53 | 11 | 70 |
| Inhibitor AZ8104 | Kg/day | 0 | 8 | 3 | 30 |
| Klaraid PC1192 | Kg/day | 0 | 47 | 17 | 150 |
| Optisperse HTP 73301 | Kg/day | 0 | 12 | 5 | 50 |
| Optisperse HTP 73611 | Kg/day | 0 | 27 | 11 | 35 |
| Optisperse PO5211A | Kg/day | 0 | 0 | 0 | 15 |
| Solus AP25 | Kg/day | 0 | 0 | 0 | 10 |
| Spectrus BD1501E | Kg/day | 0 | 4 | 1 | 25 |
| Spectrus NX1100 | Kg/day | 0 | 4 | 1 | 9 |
| Steamate NA0880 | Kg/day | 0 | 18 | 8 | 25 |

Compliance with conditions on effluent composition was achieved throughout the monitoring period from July 2018 to June 2019.

Equivalent chemical

No water treatment chemical changes were requested during the 2018-2019 monitoring period.

Permitted activity – onsite sewage disposal

The Waitara Valley site has operated a sewage treatment unit since 2011 (when Methanex surrendered their consent to discharge sewage via the Waitara marine outfall). In May 2017 Methanex advised the Council that they intended to replace the existing unit with a new unit that would be of a larger capacity, as well as providing a higher level of treatment than the existing unit. The Council was advised that effluent quality from this type of system was expected to be better than 20 mg/L BOD₅ and 20 mg/L suspended solids with removal of over 99% of faecal coliforms. This effluent, similarly to the existing system, would be disposed of by trickling to the land below the site ponds. The Council were advised that the unit is a Hynds Submerged Aerated Filtration Wastewater System.

The matter was considered and was found to meet the permitted activity rule criteria of the RFWMP, as had the previous system.

3.2.4 Uncontaminated stormwater

All stormwater from process areas is contained on the Waitara Valley site in the stormwater pond. Consent 0802-2 allows for the discharge of uncontaminated stormwater to the Waitara River. In April 1994, Methanex made a decision to discharge all routine stormwater from the site via the Waitara marine outfall (consent 3399-2).

The Waitara River discharge (consent 0802-2) occurs very rarely and only when there is an extreme rainfall event, when the pumps to the outfall cannot keep up with the stormwater received from the site.

To monitor any effects to the Waitara River caused by the stormwater discharge, a total of 37 biological surveys of three sites were carried out between June 1983 and May 1994. No adverse effect on riverbed macroinvertebrate communities or algal populations were found, which could be attributed to the stormwater discharge.

This consent was not exercised during the 2018-2019 monitoring period.

3.2.5 Inter-laboratory comparisons

The Council carried out an inter-laboratory comparison on one occasion during the monitoring period under review (the site was not operational when the spring/summer inter-laboratory comparison was undertaken at Motunui). Split samples were collected from the Waitara Valley site effluent, and analysed by Methanex and the Council. The results of the inter-laboratory comparisons are shown in Table 19. The exercise also serves as a compliance monitoring check.

Table 19 Inter-laboratory comparison on Waitara Valley effluent composite sample results

| Parameter | Unit | Consent limits | 12 June 2019 | |
|------------------------|-------|----------------|--------------|-------|
| | | | Methanex | TRC |
| Ammonia as N | mg/l | | - | 7.2 |
| Chemical oxygen demand | mg/l | 200 | <25 | 18 |
| Conductivity @ 25°C | µs/cm | 300* | 1,920 | 1,901 |
| Copper – acid soluble | mg/l | 0.5 | <0.05 | 0.035 |

| Parameter | Unit | Consent limits | 12 June 2019 | |
|------------------------|------|-------------------------|--------------|-------|
| | | | Methanex | TRC |
| Methanol | mg/l | 15 | <2 | <2 |
| Nickel – acid soluble | mg/l | 1.0 | <0.10 | <0.01 |
| pH | | 6.0-11.0 | 7.5 | 7.4 |
| Total hydrocarbons | mg/l | 10 | <0.1 | <4 |
| Total suspended solids | mg/l | daily discharge <500 kg | 6 | 8 |
| Turbidity | NTU | | 5.2 | - |
| Zinc – acid soluble | mg/l | 1.0 | <0.10 | 0.11 |

* Guideline limit; not a consent limit

Results from each laboratory for wastewater discharges met the consented water quality criteria on all occasions. Conductivity was elevated in the samples, but with consideration of previous analytical results, this was not considered to be of concern.

Overall there was good agreement between the inter-laboratory analytical sample results for the 2018-2019 monitoring period.

3.2.5.1 Methanex Waitara Valley annual report

Condition 15 of consent 3399 requires Methanex to provide the Council with an annual report on its wastewater disposal system, including the performance of the outfall and compliance with the consent. It was agreed in 2010 that this annual report would consist of monthly reports submitted to the Council on the performance of the wastewater disposal system. Methanex have produced and provided reports throughout the monitoring period and thus comply with this condition.

3.2.6 Air

3.2.6.1 Inspections

During the monitoring period, inspections of the Waitara Valley site were completed by an officer of the Council. Inspections are integrated for air and water related monitoring.

No discernible effects on the receiving environment beyond the site perimeter were noted during any of the inspections.

3.2.6.2 Consent requirements

Special condition 4 of resource consent 4045-3 requires that, every three years from the date of granting the consent, Methanex provides the Council with a report covering the following:

- Options for reducing or mitigating emissions, focusing on odorous emissions, carbon dioxide and the cooling tower plume.
- An emissions inventory (excluding carbon dioxide).
- Energy efficiency measures implemented at the Waitara Valley site.
- Any other relevant matters.

Methanex supplied a combined report for both Motunui and Waitara Valley in September 2018 covering the 2016 and 2017 calendar years (Appendix V). The reported ground level concentrations of nitrogen dioxide,

carbon monoxide and methanol were all within consent limits. The next report will be due in 2020 and will cover the 2018 and 2019 calendar years.

3.2.7 Soil

During the monitoring period, Methanex disposed of soil from tank bunds to cleanfill. This was done following soil testing and review by Council officers which found the soil to be suitable for use as cleanfill. In addition to this, sediment from the stormpond was removed and disposed of to the Remediation New Zealand site at Uruti. This was done following composite soil sample testing with the review and approval of the results undertaken by Council officers.

3.3 Investigations, interventions, and incidents

In the 2018-2019 monitoring period there was one event that required follow-up recorded by the Council that were associated with Methanex's Waitara Valley site.

Consent limit breach: Water take

As discussed in section 2.2.6 of this report, during February and March 2019, the Waitara River fell below the cut-off point of 4,600 l/s. Methanex continued production following consultation and permission being received from the Water Shortage Event Manager who gave consideration to the extent to which the river level had fallen, the accuracy of flow gauges (margin of error) and weather forecasts.

3.4 Discussion

3.4.1 Discussion of site performance

During each inspection by the Council, officers have noted that the facility is well managed, with a high standard of housekeeping apparent.

3.4.2 Environmental effects of exercise of water permits

Methanex continued to show good control of the activities permitted by the resource consents associated with the Waitara Valley site and no adverse environmental effects in relation to the water takes or discharges to the marine outfall were observed during the period under review.

3.4.3 Environmental effects of exercise of air discharge permit

Neighbourhood effects

Methanex continued to show good control of the activities permitted by the air discharge resource consents associated with the Waitara Valley site. No off-site effects were noted during the period under review.

Ecological effects

No adverse environmental effects were observed during the period under review.

3.4.4 Evaluation of performance

A tabular summary of Methanex's compliance record for the year under review is set out in Table 20 to Table 24.

Table 20 Summary of performance for Consent 0801-2

| Purpose: To take water from Waitara River | | |
|---|--|---|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Limit on total volume of water from the two intakes no more than 300 m ³ | Review of self-monitoring data provided monthly | Yes |
| 2. Water take should be maximised from the Motunui intake structure | Liaison with the consent holder | Yes |
| 3. Water take managed to ensure Waitara River flow at Bertrand Rd > 4,600 l/s. No taking to occur when the river level falls below this | Ongoing monitoring of river levels and Methanex self-monitoring data | No (notional) – Permission received to continue production from Water Shortage Event Manager |
| 4. Installation and maintenance of an appropriate water meter and provision of records to the Council | Review of abstraction records provided to the Council | Yes |
| 5. Provision of reports on the testing of pipeline integrity and water use reduction programmes | Water conservation reports received September 2018. Pipeline testing is overdue. Methanex and Council have been in discussion on how best to achieve this | Water conservation report received Pipeline testing report on hold through discussion with Council |
| 6. Appropriate screening of intake to prevent fish entrainment | Inspection and liaison with consent holder | Yes |
| 7. Lapse condition | N/A | N/A |
| 8. Review provision | Adopted 2013/14 monitoring report recommendation to not review consent. No further provision for review | 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 21 Summary of performance for Consent 0802-2

| Purpose: To discharge uncontaminated stormwater to the Waitara River | | |
|--|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Adoption of best practicable option | Inspections and liaison with consent holder. Consent not exercised during this monitoring period | N/A |
| 2. Activity to be undertaken generally in accordance with the consent application documentation | Consent not exercised during this monitoring period | N/A |
| 3. Any stormwater to be discharged to the Waitara River to be tested and results provided to the Council for approval before discharge | No discharge reported | N/A |
| 4. Specified chemical constituents not to be exceeded in the discharge | Consent not exercised during this monitoring period | N/A |
| 5. Specified prohibited effects on the receiving water | Consent not exercised during this monitoring period | N/A |
| 6. Lapse condition | N/A | N/A |
| 7. Review provision | Adopted 2013/14 monitoring report recommendation to not review consent. No further provision for review | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent | | N/A |
| Overall assessment of administrative performance in respect of this consent | | N/A |

N/A = not applicable

Table 22 Summary of performance for Consent 3399-2

| Purpose: To discharge treated wastewater into the Tasman Sea | | |
|---|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Consent holder to adopt best practicable option to prevent or minimise adverse effects | Inspections (and separate programme) | Yes |
| 2. Consent holder to maintain a record of the volume of effluent discharged each day | Monthly reports received | Yes |
| 3. Maximum daily discharge 5,000 m ³ / day, 60 l/s | Monthly reports received | Yes |
| 4. Minimum initial dilution of effluent 100:1 | Outfall designed to specific design and physical modelling was undertaken. Review of effluent data and volumes discharged was also undertaken | Yes |

| Purpose: To discharge treated wastewater into the Tasman Sea | | |
|--|--|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 5. Maximum daily discharge of suspended solids 500 kg | Monthly reports | Yes |
| 6. pH not to exceed range of 6 to 11 | Monthly reports | Yes |
| 7. Limits on concentration of COD, hydrocarbons, methanol, ammonia, copper, nickel, zinc | Consent holder provided data | Yes |
| 8. Allowable water treatment chemicals and volumes | Inspection and liaison with consent holder | Yes |
| 9. Approval from the Council required to discharge 'equivalent' chemical | Not requested during this monitoring period | N/A |
| 10. Definition of 'equivalent' | N/A | N/A |
| 11. Discharge of equivalent chemical requires written request | Not requested during this monitoring period | N/A |
| 12. Conditions 5, 6, 7 and 8 apply to effluent prior to entry into the outfall line | Monitoring/sampling undertaken in accordance with this provision | N/A |
| 13. Limits in conditions 7 and 8 apply unless the Council has given approval for a short term change | Limits met | Yes |
| 14. Effects on receiving waters | Previous marine ecological surveys (separate programme) | N/A |
| 15. Consent holder to maintain contingency plan | Contingency plan received in September 2014 and accepted. Methanex reviewed the plan in 2016 and advised Council that no changes were required | Yes |
| 16. No domestic sewage in discharge after closure of Waitara Municipal WWTP | Domestic sewage discharged to land | Yes |
| 17. Consent holder to certify the structural integrity and dilution performance of outfall at least every five years | Report received February 2014. A commercial diver survey was undertaken to inspect the integrity of the outfall in November 2013. The dilution performance was analysed through a modelling exercise | Yes |
| 18. Consent holder to supply an annual report by 31 March each year | Reports received monthly and reviewed as satisfactory | Yes |
| 19. Lapse of consent | N/A | N/A |
| 20. Review of consent | Adopted 2013/14 monitoring report recommendation to not review consent. No further provision for review | N/A |

| Purpose: To discharge treated wastewater into the Tasman Sea | | |
|---|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 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 23 Summary of performance for Consent 3960-2

| Purpose: To construct a rock groyne in the Waitara River | | |
|---|---|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Notification prior to maintenance works | No maintenance work required | N/A |
| 2. Removal of structures when no longer required | Structure still required | N/A |
| 3. Optional review provision re environmental effects | Adopted 2013/14 monitoring report recommendation to not review consent. No further provision for review | N/A |
| Overall assessment of consent compliance and environmental performance in respect of this consent | | N/A |
| Overall assessment of administrative performance in respect of this consent | | N/A |

N/A = not applicable

Table 24 Summary of performance for Consent 4045-3

| Purpose: To discharge contaminants into the air | | |
|---|--|-----------------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 1. Adoption of best practicable options likely to minimise adverse effects on the environment | Ongoing inspection and liaison with consent holder | Yes |
| 2. Minimisation of emissions through control of processes | Ongoing inspection and liaison with consent holder | Yes |
| 3. Consultations prior to alterations to the plant or processes | Inspection and liaison found no alterations to plant or processes requiring additional approvals | Yes |
| 4. Triennial written air discharge report | Report received September 2018 | Yes |
| 5. Maximum ground-level concentrations of methanol beyond boundaries | Previous modelling has shown compliance when site in full operation | Yes |
| 6. Maximum ground-level concentrations of carbon monoxide beyond boundaries | Previous modelling has shown compliance when site in full operation | Yes |

| Purpose: <i>To discharge contaminants into the air</i> | | |
|---|---|----------------------|
| Condition requirement | Means of monitoring during period under review | Compliance achieved? |
| 7. Maximum ground-level concentrations of nitrogen dioxide beyond boundaries | Previous modelling has shown compliance when site in full operation | Yes |
| 8. Maximum ground-level concentrations of other contaminants beyond boundaries | Previous modelling has shown compliance when site in full operation | Yes |
| 9. No offensive or objectionable odour at or beyond the site boundaries | Inspection | Yes |
| 10. Adverse effects on ecosystems not permitted | Inspection of neighbourhood found no adverse effects | Yes |
| 11. Optional review provision – notification within 6 months of receiving report (condition 4) re environmental effects | No review | N/A |
| 12. Monitoring to the satisfaction of the Council | Annual review and ongoing liaison | Yes |
| 13. Lapse condition | N/A | N/A |
| 14. Review provision | Adopted 2013/14 monitoring report recommendation to not review consent. No further provision for review | 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 25 Evaluation of environmental performance over time

| Year | Consent no | High | Good | Improvement req | Poor |
|-----------|------------|------|------|-----------------|------|
| 2013-2014 | 0801-2 | 1 | | | |
| | 0802-2 | N/A | | | |
| | 3399-2 | 1 | | | |
| | 3960-2 | N/A | | | |
| | 4045-3 | 1 | | | |
| 2014-2015 | 0801-2 | 1 | | | |
| | 0802-2 | 1 | | | |
| | 3399-2 | 1 | | | |
| | 3960-2 | N/A | | | |
| | 4045-3 | 1 | | | |
| 2015-2016 | 0801-2 | 1 | | | |
| | 0802-2 | N/A | | | |

| Year | Consent no | High | Good | Improvement req | Poor |
|-----------|------------|------|------|-----------------|------|
| | 3399-2 | 1 | | | |
| | 3960-2 | N/A | | | |
| | 4045-3 | 1 | | | |
| 2016-2017 | 0801-2 | 1 | | | |
| | 0802-2 | N/A | | | |
| | 3399-2 | 1 | | | |
| | 3960-2 | N/A | | | |
| | 4045-3 | 1 | | | |
| 2017-2018 | 0801-2 | 1 | | | |
| | 0802-2 | N/A | | | |
| | 3399-2 | 1 | | | |
| | 3960-2 | N/A | | | |
| | 4045-3 | 1 | | | |
| 2018-2019 | 0801-2 | 1 | | | |
| | 0802-2 | N/A | | | |
| | 3399-2 | 1 | | | |
| | 3960-2 | N/A | | | |
| | 4045-3 | 1 | | | |
| Totals | | 19 | | | |

In assessing a compliance and environmental performance ranking for Methanex, consideration was also given to the incidents that occurred during the monitoring period as well as overall environmental performance and risk management. During the period, Methanex demonstrated high level of environmental and administrative performance and compliance with their resource consents for the Waitara Valley site as defined in Section 1.1.4

3.5 Recommendations from the 2017-2018 Annual Report

In the 2017-2018 Annual Report, it was recommended:

1. THAT in the first instance monitoring of consented activities at the Methanex Waitara Valley site in the 2018-2019 year continues at the same level as in 2017-2018.
2. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT Methanex continue with investigations on the required testing to establish water intake pipeline integrity at intervals of at least every five years and that this either result in the undertaking of the required testing or a variation of consent conditions.

Recommendations 1 and 2 were implemented in full. Ongoing discussion and investigation into methods for testing the integrity of the water pipeline have continued. Further consideration will be given to this during the consent renewal process in 2021.

3.6 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 2019-2020 in the first instance, monitoring of consented activities at Methanex Waitara Valley site in the 2019-2020 year continue at the same level as in 2018-2019.

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

3.7 Recommendations

1. THAT in the first instance, monitoring of consented activities at Methanex Waitara Valley 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.

4 Recommendations

A summary of the recommendations for the Motunui and Waitara Valley plants is as follows:

1. THAT in the first instance, monitoring of consented activities at both Methanex sites 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:

| | |
|-----------------------|---|
| Biomonitoring | Assessing the health of the environment using aquatic organisms. |
| BOD | Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate. |
| 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. |
| cfu | Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample. |
| COD | Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction. |
| Conductivity | Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in $\mu\text{S}/\text{cm}$. |
| Council | The Taranaki Regional Council. |
| Cu* | Copper. |
| Cumec | A volumetric measure of flow- 1 cubic metre per second ($1 \text{ m}^3/\text{s}$). |
| DO | Dissolved oxygen. |
| DRP | Dissolved reactive phosphorus. |
| F | Fluoride. |
| 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. |
| 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. |
| 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. |
| l/s | Litres per second. |
| m^2 | Square metres. |
| m^3 | Cubic 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. |
| mg/l | Milligrams per litre. |

| | |
|------------------|---|
| μS/cm | Microsiemens per centimetre. |
| 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). |
| Ni | Nickle. |
| NTU | Nephelometric Turbidity Unit, a measure of the turbidity of water. |
| NPDC | New Plymouth District Council. |
| O&G | Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons). |
| pH | A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5. |
| Physicochemical | Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment. |
| 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</i> 1991 and including all subsequent amendments. |
| SS | Suspended solids. |
| Sulphuric Acid | A strong, dense, colourless and oily acid, used commonly for commercial/manufacturing purposes. It has strong dehydrating properties and is also a good oxidising agent. |
| Temp | Temperature, measured in °C (degrees Celsius). |
| Turbidity | Turbidity, expressed in NTU. |
| WWTP | Wastewater treatment plant. |
| 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.

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- Taranaki Regional Council, (1993): *New Zealand Synthetic Fuels Corporation Limited Groundwater Monitoring Report, 1 January to 31 December 1992*. Technical Report 93- 2
- Taranaki Regional Council, (1991c): *New Zealand Synthetic Fuels Corporation Limited Groundwater Monitoring Report, 1 July to 31 December 1991*. Technical Report 91- 41
- Taranaki Regional Council, (1991b): *New Zealand Synthetic Fuels Corporation Limited Groundwater Monitoring Report, 1 January to 30 June 1991*. Technical Report 91-10
- Taranaki Regional Council, (1991a): *New Zealand Synthetic Fuels Corporation Limited Groundwater Monitoring Report, 1 July to 1 December 1990*. Technical Report 91-2

Taranaki Regional Council, (1990): *New Zealand Synthetic Fuels Corporation Limited Groundwater Monitoring Report, 1 January to 30 June 1990*. Technical Report 90-28

Appendix I

Resource consents held by Methanex

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

| Consent holder | Consent number | Purpose | Granted | Review | Expires |
|----------------------------------|----------------|---|---------------|-----------|-------------|
| <i>Water abstraction permits</i> | | | | | |
| Methanex Motunui | 0820-2 | To take from Waitara River | 29 April 2008 | June 2015 | 1 June 2021 |
| Methanex Waitara | 0801-2 | To take from Waitara River at two locations | 29 April 2008 | June 2015 | 1 June 2021 |
| <i>Water discharge permits</i> | | | | | |
| Methanex Motunui | 0822-2 | To discharge uncontaminated stormwater to Waihi and Manu Streams | 29 Nov 2012 | June 2015 | 1 June 2027 |
| Methanex Motunui | 0825-3 | To discharge uncontaminated stormwater to an unnamed tributary of the Waitara River | 31 March 2008 | June 2015 | 1 June 2021 |
| Methanex Motunui | 0827-3 | To discharge wastewater to an unnamed tributary of the Waitara River | 31 March 2008 | June 2015 | 1 June 2021 |
| Methanex Motunui | 3400-2 | To discharge treated wastewater and stormwater to the Tasman Sea | 29 April 2008 | June 2015 | 1 June 2021 |
| Methanex Waitara | 0802-2 | To discharge stormwater to the Waitara River | 31 March 2008 | June 2015 | 1 June 2021 |
| Methanex Waitara | 3399-2 | To discharge treated wastewater and stormwater to the Tasman Sea | 29 July 2013 | June 2015 | 1 June 2021 |
| <i>Air discharge permit</i> | | | | | |
| Methanex Waitara | 4042-3 | To discharge contaminants to air | 12 Feb 2008 | June 2023 | 1 June 2028 |
| Methanex Waitara | 4045-3 | To discharge contaminants to air | 29 April 2008 | June 2015 | 1 June 2021 |
| <i>Land use permits</i> | | | | | |
| Methanex Waitara | 3960-2 | To construct rock groyne in the Waitara River | 14 May 2003 | June 2015 | 1 June 2021 |

[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.

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

Name of
Consent Holder: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 29 April 2008

Conditions of Consent

Consent Granted: To take water from two sites on the Waitara River for use
at the Waitara Valley methanol plant at or about
2618429E-6240375N and 2619820E-6238250N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Waitara Valley Intake Structure, Mamaku Road, Waitara
and Motunui Intake structure, East Bank, Waitara River

Catchment: Waitara

Consent 0801-2

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 total volume of water taken from the two intake sites shall not exceed 300 cubic metres per hour.
2. The consent holder shall maximise the water take from the Waitara River at the Motunui intake structure and minimise abstraction at the Waitara Valley intake structure.
3. The taking of water authorised by this consent shall be managed to ensure that the flow in the Waitara River at Bertrand Road gauging station is no less than 4600 litres per second. No taking shall occur when the flow is less than 4600 litres per second.
4. The consent holder shall install, and thereafter maintain, a water meter that will record the rate and volume of water taken(date, hourly abstraction rate, and daily total abstraction) to an accuracy of $\pm 5\%$ and make these records available to the Chief Executive, Taranaki Regional Council in a suitable digital format, no later than 31 July of each year. The water meter shall be capable of being equipped with a digital data logger compatible with the Taranaki Regional Council's hydrologic recording software.
5. Notwithstanding the terms and conditions of this consent the consent holder shall take all reasonable steps to avoid, remedy or mitigate any adverse effect on the environment arising from the exercise of this consent, including, but not limited to, the efficient and conservative use of water. This shall include:
 - a. testing of the pipeline from the intake to the plant every five years to establish pipeline integrity; and
 - b. a written report to the Chief Executive of Taranaki Regional Council, at intervals not exceeding two years, on the results of water use reduction programmes.
6. The consent holder shall ensure that the intake structure is appropriately screened to avoid the entrainment of fish. The intake shall be regularly monitored and maintained to achieve compliance with this condition.

Consent 0801-2

7. This consent shall lapse five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
8. 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, for the purpose of : [a] 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; [b] the amount of water authorised to be taken is consistent with the consent holders reasonable requirements.

Signed at Stratford on 29 April 2008

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 31 March 2008

Conditions of Consent

Consent Granted: To discharge stormwater from the Waitara Valley Methanol
Plant into the Waitara River at or about
2618495E-6241539N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Waitara Valley Methanol Plant, Mamaku Road, Waitara

Legal Description: Lot 1 DP 13541 Blk V Waitara SD

Catchment: Waitara

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 on the environment from the exercise of this consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4599. In the case of any contradiction between the documentation submitted in support of application 4599 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall test the levels of contaminants in the stormwater prior to discharge into the Waitara River and advise the Chief Executive of Taranaki Regional Council of the results. The stormwater shall not be discharged until the Chief Executive of Taranaki Regional Council has advised the consent holder that the discharge will comply with the standards specified in condition 5.
4. The following constituents of the discharge shall not be exceeded in the discharge:

| <u>Constituent</u> | <u>Standard</u> |
|--------------------|----------------------|
| pH (range) | 6.0-9.0 |
| suspended solids | 100 gm ⁻³ |
| hydrocarbons | 15 gm ⁻³ |
| methanol | 15 gm ⁻³ |

Consent 0802-2

5. After allowing for a 50 metre mixing zone extending downstream of the discharge point the discharge shall not give rise to any of the following effects in the receiving waters of the Waitara River:
 - 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.
6. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
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, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 31 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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

Name of
Consent Holder: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 29 April 2008

Conditions of Consent

Consent Granted: To take water from the Waitara River for use at the
Motunui plant at or about 2619820E-6238250N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Motunui Intake Structure, East Bank, Waitara River

Catchment: Waitara

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 volume of water taken shall not exceed 1400 cubic metres per hour.
2. The taking of water authorised by this consent shall be managed to ensure that the flow in the Waitara River at the Bertrand Road gauging station is no less than 4,600 litres per second. No taking shall occur when the flow is less than 4,600 litres per second.
3. The consent holder shall install, and thereafter maintain, a water meter that will record the rate and volume of water taken(date, hourly abstraction rate, and daily total abstraction) to an accuracy of $\pm 5\%$ and make these records available to the Chief Executive, Taranaki Regional Council in a suitable digital format, no later than 31 July of each year. The water meter shall be capable of being equipped with a digital data logger compatible with the Taranaki Regional Council's hydrologic recording software.
4. Notwithstanding the terms and conditions of this consent the consent holder shall take all reasonable steps to avoid, remedy or mitigate any adverse effect on the environment arising from the exercise of this consent, including, but not limited to, the efficient and conservative use of water. This shall include:
 - a. testing of the pipeline from the intake to the plant every five years to establish pipeline integrity; and
 - b. a written report to the Chief Executive of Taranaki Regional Council, at intervals not exceeding two years, on the results of water use reduction programmes.
5. The consent holder shall ensure that the intake structure is appropriately screened to avoid the entrainment of fish. The intake structure shall be regularly monitored and maintained to achieve compliance with this condition.

Consent 0820-2

6. This consent shall lapse five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
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, for the purpose of: [a] 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; [b] the amount of water authorised to be taken is consistent with the consent holders requirements.

Signed at Stratford on 29 April 2008

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH 4342

Decision Date: 29 November 2012

Commencement
Date: 29 November 2012

Conditions of Consent

Consent Granted: To discharge uncontaminated stormwater from outfalls into an unnamed tributary of the Waihi Stream at or about (NZTM) 1711804E-5683660N and into the the Manu Stream at or about (NZTM)1710848E-5683737N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: State Highway 3, Motunui, Waitara

Legal Description: Lot 1 DP 324944 Pt Ngatirahiri 2F Pt Lot 1 DP 10081 Ngatirahiri 2C1C 2B2B2 2B2A1 2C1B 2B2A2B Pt 2B1 2B2A2A 2B2B1 2C1A [Discharge source & site]

Catchment: Waihi

*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. 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. The stormwater discharged shall be from a catchment area not exceeding 240000 m² for the Waihi Stream tributary, and 294000 m² for the "Duck Pond", as specified in Methanex drawing number g10637 supplied with application 5748 .
3. The consent holder shall maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent. The contingency plan shall be followed in the event of a spill or unauthorised discharge and shall be certified by the Chief Executive, Taranaki Regional Council as being adequate to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.
4. The consent holder shall maintain a stormwater management plan that documents how the site is to be managed to minimise the contaminants that become entrained in the stormwater. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to:
 - a) the loading and unloading of materials;
 - b) maintenance of conveyance systems;
 - c) general housekeeping; and
 - d) management of the interceptor system.
5. Constituents of the discharge shall meet the standards shown in the following table.

| Constituent | Standard |
|--------------------------------|---|
| pH | Within the range 6.0 to 9.5 |
| suspended solids | Concentration not greater than 100 gm ⁻³ |
| total recoverable hydrocarbons | Concentration not greater than 5 gm ⁻³ |

This condition shall apply to the uncontaminated stormwater prior to entry into the body of water commonly known as the "Duck Pond" and the unnamed tributary of the Waihi Stream at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

Consent 0822-2

6. After allowing for reasonable mixing, within a mixing zone extending to the downstream end of the body of water known as 'The Duck Pond' the discharge shall not give rise to any of the following effects in the receiving waters of the Manu Stream:
 - 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.

7. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge points into the unnamed tributary of the Waihi Stream the discharge shall not give rise to any of the following effects in the receiving waters of the Waihi Stream:
 - 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.

8. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

9. 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 29 November 2012

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 31 March 2008

Conditions of Consent

Consent Granted: To discharge stormwater from the Motunui intake facility
into an unnamed tributary of the Waitara River at or about
2619942E-6238671N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Motunui intake facility, Tikorangi Road, Waitara

Legal Description: Pt Lot 2 DP 12099 Blk IX Waitara SD

Catchment: Waitara

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 on the environment from the exercise of this consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4594. In the case of any contradiction between the documentation submitted in support of application 4594 and the conditions of this consent, the conditions of this consent shall prevail.
3. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the confluence of unnamed tributary and the Waitara River, the discharge shall not give rise to an increase in turbidity of greater than 50% [as determined using NTU (nephelometric turbidity units)], in the receiving waters.
4. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 0825-3

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

Signed at Stratford on 31 March 2008

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 31 March 2008

Conditions of Consent

Consent Granted: To discharge wastewater from the Motunui intake facility
into an unnamed tributary of the Waitara River at or about
2619942E-6238671N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Motunui Intake Station, Tikorangi Road, Waitara

Legal Description: Pt Lot 2 DP 12099 Blk IX Waitara SD

Catchment: Waitara

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 maximum daily discharge shall not exceed 1000 cubic metres per day.
- 2. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
- 3. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4595. In the case of any contradiction between the documentation submitted in support of application 4595 and the conditions of this consent, the conditions of this consent shall prevail.
- 4. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the confluence of the unnamed tributary with the Waitara River, the discharge shall not give rise to an increase in turbidity of greater than 50% [as determined using NTU (nephelometric turbidity units)], in the receiving waters.
- 5. 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, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 31 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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

Name of
Consent Holder: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 29 April 2008

Conditions of Consent

Consent Granted: To discharge treated wastewater and stormwater from the Waitara Valley methanol plant into the Tasman Sea via the Waitara marine outfall at or about 2615711E-6246696N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: at or beyond 1250 metre offshore from Waitara River mouth

Catchment: Tasman Sea

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 on the environment from the exercise of this consent.
2. The consent holder shall maintain a record of the volume of effluent discharged each day to an accuracy of $\pm 5\%$ and make these records available to the Chief Executive, Taranaki Regional Council in a digital format compatible with Council software, no later than 20th of the following month.
3. The maximum daily discharge shall be 5000 cubic metres per day at a maximum rate of 60 litres per second.
4. The consent holder shall ensure that the minimum initial dilution of the effluent above the outfall diffuser shall be 100:1.
5. The maximum daily discharge of suspended solids shall be 500 kilograms.
6. The consent holder shall ensure that the pH of the effluent shall not exceed the range of pH 6 to pH 9 unless it is to be combined with the lime treated wastewater from the Waitara Wastewater Treatment Plant, in which case, it shall not exceed the range pH 6 to pH 11.

7. On the basis of 24-hour flow proportioned composite samples, constituents of the discharge shall meet the standards shown below:

| <u>Constituent</u> | <u>Standard</u> |
|------------------------|--|
| Chemical oxygen demand | concentration no greater than 200 gm ⁻³ |
| Hydrocarbons | concentration no greater than 10 gm ⁻³ |
| Methanol | concentration no greater than 15 gm ⁻³ |
| Ammonia | concentration no greater than 200 gm ⁻³ |
| Copper | concentration no greater than 0.5 gm ⁻³ |
| Nickel | concentration no greater than 1.0 gm ⁻³ |
| Zinc | concentration no greater than 2.0 gm ⁻³ |

8. Subject to condition 9, only the water treatment chemicals listed in Table 1 shall be discharged, and the daily quantity discharged shall not exceed the limits given Table 1 below.

Table 1: List of water treatment chemicals

| Purpose | Trade name | Maximum Daily discharge (kg) |
|--|-----------------------------|-------------------------------------|
| Corrosion control in high pressure boiler | Optisperse HTP 7330 & 73611 | 50 |
| Corrosion control in medium pressure boiler | Optisperse PO5211A | 15 |
| Oxygen removal from boiler feed water | Cortrol OS7780 | 300 |
| pH control of steam/condensate to prevent corrosion. | Steamate NA0880 | 25 |
| Corrosion control of re-circulating cooling water. | Continuum AEC3109 | 100 |
| Control biological activity in cooling water | Spectrus BD1500 | 50 |
| Corrosion control of re-circulating cooling water | Inhibitor AZ8104 | 30 |
| Reduce foam formation of cooling water | Foamtrol AF2290 | 2 |
| Coagulant | Klaraid PC 1192 | 150 |

9. In addition to the water treatment chemical listed in Table 1 [condition 8], water treatment chemicals considered to be 'equivalents' may be discharged as an alternative to those listed in Table 1, provided approval for the equivalent chemical has been given by the Chief Executive of Taranaki Regional Council in accordance with condition 11.
10. For the purpose of this consent an 'equivalent' is defined as a chemical that, when compared the chemical listed in Table 1, the Chief Executive of Taranaki Regional Council has determined that:

Consent 3399-2

- a) it is of a similar nature and used for a similar purpose;
- b) it has similar breakdown products; and
- c) it has potential environmental effects that are similar.

11. Any discharge of an equivalent chemical in accordance with condition 9, shall only occur after a written request to discharge an equivalent chemical has been approved by Chief Executive Taranaki Regional Council. Any such request shall include:

- a) name of equivalent chemical;
- a) proposed concentration of equivalent in the discharge; and
- b) details of the nature of the chemical including its breakdown products; and
- c) an assessment of the potential effects of the change on the receiving environment.

Note that the Chief Executive of Taranaki Regional Council may take up to 20 days to consider the request.

12. Special conditions 5, 6, 7 and 8 apply to effluent prior to entry into the outfall line, at a designated sampling point approved by the Chief Executive of Taranaki Regional Council.
13. The limits in special conditions 7 and 8 apply unless the Chief Executive of Taranaki Regional Council has given approval for a short term change for the purpose of routine maintenance including physical and chemical cleaning and catalyst changeouts, as per condition 11.
14. After allowing for reasonable mixing, being outside of a zone of 200 metres from the centreline of the outfall diffuser, the discharge shall not give rise to any of the following effects in the receiving waters:
- 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) any significant adverse effects on aquatic life, habitats or ecology;
 - e) any undesirable biological growths.
15. The consent holder shall maintain a comprehensive contingency plan, to be put into operation to prevent unauthorised discharge resulting from spillages, accidental discharges or pipeline failure. The plan shall be provided to the Chief Executive, Taranaki Regional Council no more than thirty [30] days after this consent is first exercised and thereafter reviewed at two yearly intervals.
16. There shall be no domestic sewage [human effluent] in the discharge authorised by this consent following the closure of the Waitara municipal wastewater treatment plant.
17. At the request of the Chief Executive, Taranaki Regional Council, but at intervals of no less than five years, the consent holder shall certify the structural integrity and dilution performance of the outfall.

Consent 3399-2

18. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, an annual report on its waste treatment system discharges. The annual report shall include:
- a) daily volumes;
 - b) results of any and all analyses undertaken by or on behalf of the consent holder; and
 - c) compliance with the consent.

This report shall be provided by the 31st March each year and covering the previous calendar year period.

19. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
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 2015 or within 3 months of receipt of notification under condition 11, 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 29 April 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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

Name of Consent Holder: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH 4342

Decision Date (Change): 29 July 2013

Commencement Date (Change): 29 July 2013 (Granted: 29 April 2008)

Conditions of Consent

Consent Granted: To discharge treated wastewater and stormwater from the Waitara Valley Methanol Plant into the Tasman Sea via the Waitara marine outfall

Expiry Date: 1 June 2021

Review Date(s): June 2015 and/or within 3 months of notification under special condition 11

Site Location: At or beyond 1250 metre offshore from Waitara Rivermouth

Grid Reference (NZTM) 1705615E-5684951N

Catchment: Tasman Sea

*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 on the environment from the exercise of this consent.
2. The consent holder shall maintain a record of the volume of effluent discharged each day to an accuracy of $\pm 5\%$ and make these records available to the Chief Executive, Taranaki Regional Council in a digital format compatible with Council software, no later than 20th of the following month.
3. The maximum daily discharge shall be 5000 cubic metres per day at a maximum rate of 60 litres per second.
4. The consent holder shall ensure that the minimum initial dilution of the effluent above the outfall diffuser shall be 100:1.
5. The maximum daily discharge of suspended solids shall be 500 kilograms.
6. The consent holder shall ensure that the pH of the effluent shall not exceed the range of pH6 to pH 9 unless it is to be combine with the line treated wastewater from the Waitara Wastewater Treatment Plant, in which case, it shall not exceed the range pH 6 to pH 11.
7. On the basis of 24-hour flow proportioned composite samples, constituents of the discharge shall meet the standards shown below:

| <u>Constituent</u> | <u>Standard</u> |
|------------------------|--|
| Chemical oxygen demand | concentration no greater than 200 gm ⁻³ |
| Hydrocarbons | concentration no greater than 10 gm ⁻³ |
| Methanol | concentration no greater than 15 gm ⁻³ |
| Ammonia | concentration no greater than 200 gm ⁻³ |
| Copper | concentration no greater than 0.5 gm ⁻³ |
| Nickel | concentration no greater than 1.0 gm ⁻³ |
| Zinc | concentration no greater than 2.0 gm ⁻³ |

8. Subject to condition 9, only the water treatment chemicals listed in Table 1 shall be discharged, and the daily quantity discharged shall not exceed the limits given Table 1 below.

Table 1: List of water treatment chemicals

| Purpose | Trade name | Maximum Daily discharge (kg) |
|--|----------------------------------|------------------------------|
| Corrosion control in high pressure boiler | Optisperse HTP 73301 & 73611 | 50 |
| Corrosion control in medium pressure boiler | Optisperse PO5211A | 15 |
| Oxygen removal from boiler feed water | Cortrol OS7780 | 300 |
| pH control of steam/condensate to prevent corrosion. | Steamate NA0880 | 25 |
| Corrosion control of re-circulating cooling water. | Gengard GN8020 Flogard MS6209 | 70 20 |
| Biocidal dispersant | Spectrus BD1500 | 50 |
| Corrosion control of re-circulating cooling water | Inhibitor AZ8104 | 30 |
| Reduce foam formation of cooling water | Foamtrol AF2290 | 2 |
| Coagulant | Klaraid PC 1192 | 150 |
| Secondary biocide | Spectrus CT1300 | 5 |

9. In addition to the water treatment chemical listed in Table 1 (condition 8), water treatment chemicals considered to be ‘equivalents’ may be discharged as an alternative to those listed in Table 1, provided approval for the equivalent chemical has been given by the Chief Executive of Taranaki Regional Council in accordance with condition 11.
10. For the purpose of this consent an ‘equivalent’ is defined as a chemical that, when compared the chemical listed in Table 1, the Chief Executive of Taranaki Regional Council has determined that:
- it is of a similar nature and used for a similar purpose;
 - it has similar breakdown products; and
 - it has potential environmental effects that are similar.
11. Any discharge of an equivalent chemical in accordance with condition 9, shall only occur after a written request to discharge an equivalent chemical has been approved by Chief Executive Taranaki Regional Council. Any such request shall include:
- name of equivalent chemical;
 - proposed concentration of equivalent in the discharge; and
 - details of the nature of the chemical including its breakdown products; and
 - an assessment of the potential effects of the change on the receiving environment.

Note that the Chief Executive of Taranaki Regional Council may take up to 20 days to consider the request.

12. Special conditions 5, 6, 7 and 8 apply to effluent prior to entry into the outfall line, at a designated sampling point approved by the Chief Executive of Taranaki Regional Council.

Consent 3399-2

13. The limits in special conditions 7 and 8 apply unless the Chief Executive of Taranaki Regional Council has given approval for a short term change for the purpose of routine maintenance including physical and chemical cleaning and catalyst changeouts, as per condition 11.
14. After allowing for reasonable mixing, being outside of a zone of 200 metres from the centreline of the outfall diffuser, the discharge shall not give rise to any of the following effects in the receiving waters:
 - 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) any significant adverse effects on aquatic life, habitats or ecology;
 - e) any undesirable biological growths.
15. The consent holder shall maintain a comprehensive contingency plan, to be put into operation to prevent unauthorised discharge resulting from spillages, accidental discharges or pipeline failure. The plan shall be provided to the Chief Executive, Taranaki Regional Council no more than thirty (30) days after this consent is first exercised and thereafter reviewed at two yearly intervals.
16. There shall be no domestic sewage (human effluent) in the discharge authorised by this consent following the closure of the Waitara municipal wastewater treatment plant.
17. At the request of the Chief Executive, Taranaki Regional Council, but at intervals of no less than five years, the consent holder shall certify the structural integrity and dilution performance of the outfall.
18. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, an annual report on its waste treatment system discharges. The annual report shall include:
 - a) daily volumes;
 - b) results of any and all analyses undertaken by or on behalf of the consent holder; and
 - c) compliance with the consent.

This report shall be provided by the 31st March each year and covering the previous calendar year period.

19. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 3399-2

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 2015 or within 3 months of receipt of notification under condition 11, 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 29 July 2013

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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

Name of
Consent Holder: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 29 April 2008

Conditions of Consent

Consent Granted: To discharge treated wastewater and stormwater from the
Motunui methanol plant into the Tasman Sea via the
Waitara marine outfall at or about 2615711E-6246696N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: At or beyond 1250 metres offshore from Waitara River
mouth

Catchment: Tasman Sea

Consent 3400-2

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 on the environment from the exercise of this consent.
2. The consent holder shall maintain a record of the volume of effluent discharged each day to an accuracy of $\pm 5\%$ and make these records available to the Chief Executive, Taranaki Regional Council in a digital format compatible with Council software, no later than 20th of the following month
3. The maximum daily discharge shall be 12,096 cubic metres per day at a maximum rate of 140 litres per second.
4. The consent holder shall ensure that the minimum initial dilution of the effluent above the outfall diffuser shall be 100:1.
5. The maximum daily discharge of suspended solids shall be 500 kilograms.
6. The consent holder shall ensure that the pH of the effluent shall at all times be within the range of pH 6 to pH 9.

7. On the basis of 24-hour flow proportioned composite samples, constituents of the discharge shall meet the standards shown below.

| <u>Constituent</u> | <u>Standard</u> |
|------------------------|--|
| Chemical oxygen demand | concentration no greater than 200 gm ⁻³ |
| Hydrocarbons | concentration no greater than 10gm ⁻³ |
| Methanol | concentration no greater than 15 gm ⁻³ |
| Copper | concentration no greater than 0.5 gm ⁻³ |
| Nickel | concentration no greater than 1.0 gm ⁻³ |
| Zinc | concentration no greater than 1.0 gm ⁻³ |

8. Subject to condition 9, only the water treatment chemicals listed in Table 1 shall be discharged, and the daily quantity discharged shall not exceed the limits given in Table 1.

Table 1: List of water treatment chemicals

| Purpose | Trade name | Maximum Daily |
|--|-----------------------------|----------------------|
| Corrosion control in high pressure boiler | Optisperse HTP 7330 & 73611 | 120 |
| Corrosion control in medium pressure boiler | Optisperse PO5211A | 20 |
| Oxygen removal from boiler feed water | Cortrol OS7780 | 400 |
| pH control of steam/condensate to prevent corrosion. | Steamate NA0880 | 40 |
| Corrosion control of recirculating cooling water. | Continuum AEC3109 | 300 |
| Control biological activity in cooling water | Spectrus BD1500 | 200 |
| Corrosion control of recirculating cooling water | Inhibitor AZ8104 | 300 |
| Control biological activity in cooling water | Spectrus NX1100 | 50 |
| Control biological activity in cooling water | Spectrus CT1300 | 20 |
| Corrosion control of recirculating cooling water | Flogard MS6207 | 40 |
| Reduce foam formation of cooling water | Foamtrol AF2290 | 40 |
| Coagulant | Klaraid PC 1190P | 600 |
| Flocculant | Betzdearborn AE1115 | 60 |

Consent 3400-2

9. In addition to the water treatment chemicals listed in Table 1, water treatment chemicals determined to be 'equivalents' may be discharged as an alternative to those listed in Table 1, provided approval for the equivalent chemical has been given by the Chief Executive of Taranaki Regional Council in accordance with condition 11.
10. For the purpose of this consent an 'equivalent' is defined as a chemical that, when compared the chemical listed in Table 1, the Chief Executive of Taranaki Regional Council has determined that:
 - a) it is of a similar nature and used for a similar purpose;
 - b) it has similar breakdown products; and
 - c) it has potential environmental effects that are similar.
11. Any discharge of an equivalent chemical in accordance with condition 9, shall only occur after a written request to discharge an equivalent chemical has been approved by Chief Executive Taranaki Regional Council. Any such request shall include:
 - a) name of equivalent chemical;
 - b) proposed concentration of equivalent in the discharge; and
 - c) details of the nature of the chemical including its breakdown products; and
 - d) an assessment of the potential effects of the change on the receiving environment.

Note that the Chief Executive of Taranaki Regional Council may take up to 20 days to consider the request.
12. Special conditions 5, 6, 7 and 8, apply to effluent prior to entry into the outfall line, at a designated sampling point approved by the Chief Executive of Taranaki Regional Council.
13. The limits in special conditions 7 and 8 apply unless the Chief Executive of Taranaki Regional Council has given approval for a short term change for the purpose of routine maintenance including physical and chemical cleaning and catalyst changeouts, as per special condition 11.
14. After allowing for reasonable mixing, being outside of a zone of 200 metres from the centreline of the outfall diffuser, the discharge shall not give rise to any of the following effects in the receiving waters:
 - 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) any significant adverse effects on aquatic life, habitats or ecology;
 - e) any undesirable biological growths
15. The consent holder shall maintain a comprehensive contingency plan, to be put into operation to prevent unauthorised discharge resulting from spillages, accidental discharges or pipeline failure. The plan shall be provided to the Chief Executive, Taranaki Regional Council no more than 30 days after this consent is first exercised and thereafter reviewed two yearly intervals.

Consent 3400-2

16. No discharge of domestic sewage [human effluent] shall be permitted under the exercise of this consent.
17. The consent holder shall notify the Chief Executive, Taranaki Regional Council at least seven days before this consent is first exercised.
18. The consent holder shall on request by the Chief Executive, Taranaki Regional Council, but at intervals of no less than five years, certify the structural integrity and dilution performance of the outfall.
19. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, an annual report on its waste treatment system discharges. The annual report shall include:
 - a) daily volumes;
 - b) results of any and all analyses undertaken by or on behalf of the consent holder;
 - c) compliance with the consent.

This report shall be provided by the 31st March each year and covering the previous calendar year period.

20. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
21. 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 or within 3 months of receipt of notification under special condition 11, 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 29 April 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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

Name of
Consent Holder: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH 4342

Decision Date
[change]: 18 July 2012

Commencement
Date [change]: 18 July 2012 [Granted: 29 April 2008]

Conditions of Consent

Consent Granted: To discharge treated wastewater and stormwater from the Motunui methanol plant into the Tasman Sea via the Waitara marine outfall at or about (NZTM) 1705615E-5684951N

Expiry Date: 1 June 2021

Review Date(s): June 2015 and/or within 3 months of receiving notification under special condition 12

Site Location: At or beyond 1250 metres offshore from Waitara River mouth

Catchment: Tasman Sea

*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 with section 36 of the Resource Management Act.

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 on the environment from the exercise of this consent.
- 2. The consent holder shall maintain a record of the volume of effluent discharged each day to an accuracy of $\pm 5\%$ and make these records available to the Chief Executive, Taranaki Regional Council in a digital format compatible with Council software, no later than 20th of the following month
- 3. The maximum daily discharge shall be 12,096 cubic metres per day at a maximum rate of 140 litres per second.
- 4. The consent holder shall ensure that the minimum initial dilution of the effluent above the outfall diffuser shall be 100:1.
- 5. The maximum daily discharge of suspended solids shall be 500 kilograms.
- 6. The consent holder shall ensure that the pH of the effluent shall at all times be within the range of pH 6 to pH 9.
- 7. On the basis of 24-hour flow proportioned composite samples, constituents of the discharge shall meet the standards shown below.

| <u>Constituent</u> | <u>Standard</u> |
|------------------------|--|
| Chemical oxygen demand | concentration no greater than 200 gm ⁻³ |
| Hydrocarbons | concentration no greater than 10gm ⁻³ |
| Methanol | concentration no greater than 15 gm ⁻³ |
| Copper | concentration no greater than 0.5 gm ⁻³ |
| Nickel | concentration no greater than 1.0 gm ⁻³ |
| Zinc | concentration no greater than 1.0 gm ⁻³ |

- 8. Subject to condition 10, only the water treatment chemicals listed in Table 1 shall be discharged, and the daily quantity discharged shall not exceed the limits given in Table 1.

Table 1: List of water treatment chemicals

| Purpose | Trade name | Maximum Daily discharge (kg) |
|--|-----------------------------|------------------------------|
| Corrosion control in high pressure boiler | Optisperse HTP 7330 & 73611 | 120 |
| Corrosion control in medium pressure boiler | Optisperse PO5211A | 20 |
| Oxygen removal from boiler feed water | Cortrol OS7780 | 400 |
| pH control of steam/condensate to prevent corrosion. | Steamate NA0880 | 40 |
| Corrosion control of recirculating cooling water. | Continuum AEC3109 | 300 |
| Control biological activity in cooling water | Spectrus BD1500 | 200 |
| Corrosion control of recirculating cooling water | Inhibitor AZ8104 | 300 |
| Control biological activity in cooling water | Spectrus NX1100 | 50 |
| Control biological activity in cooling water | Spectrus CT1300 | 20 |
| Corrosion control of recirculating cooling water | Flogard MS6207 | 40 |
| Reduce foam formation of cooling water | Foamtrol AF2290 | 40 |
| Coagulant | Klaraid PC 1190P | 600 |
| Flocculant | Betzdearborn AE1115 | 60 |

9. The maximum daily limit of the water treatment chemical 'Spectrus CT1300' may be increased to 40kg/day in response to increased levels of the bacteria Legionella if detected by the consent holder, to minimise the risk to human health. The Consent holder must notify the Council within 24 hours if this increased dose is utilized.
10. In addition to the water treatment chemicals listed in Table 1, water treatment chemicals determined to be 'equivalents' may be discharged as an alternative to those listed in Table 1, provided approval for the equivalent chemical has been given by the Chief Executive of Taranaki Regional Council in accordance with condition 12.
11. For the purpose of this consent an 'equivalent' is defined as a chemical that, when compared the chemical listed in Table 1, the Chief Executive of Taranaki Regional Council has determined that:
 - a) it is of a similar nature and used for a similar purpose;
 - b) it has similar breakdown products; and
 - c) it has potential environmental effects that are similar.
12. Any discharge of an equivalent chemical in accordance with condition 10, shall only occur after a written request to discharge an equivalent chemical has been approved by Chief Executive Taranaki Regional Council. Any such request shall include:
 - a) name of equivalent chemical;
 - b) proposed concentration of equivalent in the discharge; and
 - c) details of the nature of the chemical including its breakdown products; and
 - d) an assessment of the potential effects of the change on the receiving environment.

Note that the Chief Executive of Taranaki Regional Council may take up to 20 days to consider the request.

Consent 3400-2

13. Special conditions 5, 6, 7 and 8, apply to effluent prior to entry into the outfall line, at a designated sampling point approved by the Chief Executive of Taranaki Regional Council.
14. The limits in special conditions 7 and 8 apply unless the Chief Executive of Taranaki Regional Council has given approval for a short term change for the purpose of routine maintenance including physical and chemical cleaning and catalyst changeouts, as per special condition 12.
15. After allowing for reasonable mixing, being outside of a zone of 200 metres from the centreline of the outfall diffuser, the discharge shall not give rise to any of the following effects in the receiving waters:
 - 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) any significant adverse effects on aquatic life, habitats or ecology;
 - e) any undesirable biological growths
16. The consent holder shall maintain a comprehensive contingency plan, to be put into operation to prevent unauthorised discharge resulting from spillages, accidental discharges or pipeline failure. The plan shall be provided to the Chief Executive, Taranaki Regional Council no more than 30 days after this consent is first exercised and thereafter reviewed two yearly intervals.
17. No discharge of domestic sewage [human effluent] shall be permitted under the exercise of this consent.
18. The consent holder shall notify the Chief Executive, Taranaki Regional Council at least seven days before this consent is first exercised.
19. The consent holder shall on request by the Chief Executive, Taranaki Regional Council, but at intervals of no less than five years, certify the structural integrity and dilution performance of the outfall.
20. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, an annual report on its waste treatment system discharges. The annual report shall include:
 - a) daily volumes;
 - b) results of any and all analyses undertaken by or on behalf of the consent holder;
 - c) compliance with the consent.

This report shall be provided by the 31st March each year and covering the previous calendar year period.

Consent 3400-2

21. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
22. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 or within 3 months of receipt of notification under special condition 12, 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 July 2012

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 14 May 2003

Conditions of Consent

Consent Granted: To construct and maintain a rock groyne in the Waitara
River to control against further river bed degradation at or
about GR: Q19:185-405

Expiry Date: 1 June 2021

Review Date(s): June 2009, June 2015

Site Location: Pump Station, Mamaku Road, Waitara

Legal Description: River Reserve Blk V Waitara SD

Catchment: Waitara

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. That the consent holder shall notify the Consents Section of the Taranaki Regional Council at least 24 hours prior to any maintenance works which would involve disturbance of, or deposition to the riverbed, or discharges to water.
- 2. That the structures authorised by this consent shall be removed and the area reinstated, if and when the structures are no longer required. The consent holder shall notify the Consents Section of the Taranaki Regional Council at least 48 hours prior to structure removal and reinstatement.
- 3. 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 26 April 2005

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 12 February 2008

Conditions of Consent

Consent Granted: To discharge contaminants into the air from the Motunui
methanol plant and ancillary facilities at or about
2621399E-6245496N

Expiry Date: 1 June 2028

Review Date(s): June 2013, June 2018, June 2023

Site Location: Main North Road, Motunui, Waitara

Legal Description: Lot 1 DP 334095 Pt Ngatirahiri 2F Blk Pt Lot 1 DP 10081
Ngatirahiri 2C1A Blk Ngatirahiri 2C1C Blk Lot 1 DP 16686
Pt Ngatirahiri 2B2B2 Blk Ngatirahiri 2B2A1 Blk Ngatirahiri
2C1B Blk Ngatirahiri 2B2A2B Blk

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 on the environment from the exercise of this consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4596. In the case of any contradiction between the documentation submitted in support of application 4596 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall at all times operate, maintain, supervise, monitor and control all processes so that emissions authorised by this consent are maintained at the minimum practicable level.
4. Prior to undertaking any alterations to the plant, processes or operations which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act.
5. The consent holder shall commission reports that detail the technology that could minimise the adverse effects of the water vapour plume from the cooling tower. These reports shall:
 - a) be prepared by an appropriately qualified independent person approved by the Chief Executive, Taranaki Regional Council;

Consent 4042-3

- b) be provided to the Chief Executive, Taranaki Regional within 12 months of the commencement of this consent [in accordance with Section 116 of the Resource Management Act 1991] and at intervals not exceeding 5 years thereafter;
 - c) detail the: costs; expected levels of reduction in adverse effects; and practical implications of introducing the technology(s) at the Motunui plant;
 - d) provide an assessment of what constitutes the “best practicable option” for minimising the adverse effects of the water vapour plume from the cooling tower.
6. Other than as provided for under condition 5, the consent holder shall also provide to the Chief Executive, Taranaki Regional Council, within two years from the date on which this consent is granted and every two years thereafter a written report:
- a) reviewing any technological advances in the reduction or mitigation of emissions, especially but not exclusively in respect of potential or actual odorous emissions, how these might be applicable and implemented at the Motunui plant, and the costs and benefits of these advances; and
 - b) detailing an inventory of emissions [excluding carbon dioxide] from the site of such contaminants as the Chief Executive, Taranaki Regional Council may from time to time specify following consultation with the consent holder; and
 - c) detailing any measures that have been taken by the consent holder to improve the energy efficiency of the Motunui petrochemical plant; and
 - d) addressing any other issue relevant to the minimization or mitigation of emissions from the site that the Chief Executive, Taranaki Regional Council considers should reasonably be included.
7. The consent holder shall control all emissions of methanol to the atmosphere from the site, so as to ensure that maximum ground level concentrations of methanol do not exceed 9 mg/m³ measured as a one hour average under ambient conditions, at or beyond the boundary of the site.
8. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the site, so as to ensure that the maximum ground level concentration of carbon monoxide measured under ambient conditions does not exceed 10 mg/m³ [average exposure over any period of eight hours or longer], or 30 mg/m³ [one hour average], at or beyond the boundary of the site.
9. The consent holder shall control all emissions of nitrogen dioxide or its precursors to the atmosphere from the site, so as to ensure that the maximum ground level concentration of nitrogen dioxide measured under ambient conditions does not exceed 200 ug/m³ [one hour average], or 100 ug/m³ [twenty four hour average], at or beyond the boundary of the site.

Consent 4042-3

10. The consent holder shall control all emissions to the atmosphere from the site of contaminants other than methanol, carbon monoxide, and nitrogen dioxide and its precursors, so as to ensure that the maximum ground level concentration for any particular contaminant at or beyond the boundary of the site is not increased above background levels:
 - a) by more than 1/30 th of the relevant Occupational Threshold Value Time Weighted Average, or by more than the Short Term Exposure Limit at any time; or
 - b) if no Short Term Exposure Limited is set, by more than three times the Time Weighted Average at any time [Workplace Exposure Standards effective from 2002, Department of Labour].
11. The consent holder shall compile an inventory of emissions discharged to air from the incinerator stacks including the date, time, nature of discharge and any visual impact of emissions offsite. The data gathered shall be supplied as part of report on air emissions stated in special condition 6.
12. The discharges authorised by this consent shall not give rise to an odour at or beyond the boundary of the site that in the opinion of at least one enforcement officer of the Taranaki Regional Council, is offensive or objectionable.
13. The discharges authorised by this consent shall not give rise to any significant adverse ecological effect on any ecosystems, including but not limited to habitats, plants, animals, microflora and microfauna.
14. Pursuant to section 128(1)(a) of the Resource Management Act, the Taranaki Regional Council, may review any or all of the conditions of this consent by giving notice of review within six months of the provision of a written report under special conditions 5 or 6; for the purpose of reviewing the best practicable option or options available to reduce or remove any adverse effects on the environment [including, but not limited to, minimisation of the cooling tower plume], or to deal with any significant adverse ecological effect on any ecosystems, including but not limited to habitats, plants, animals, microflora, and microfauna.
15. The exercise and effects of this consent shall be monitored to the satisfaction of the Chief Executive, Taranaki Regional Council.
16. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 4042-3

17. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2013 and/or June 2018 and/or June 2023, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 12 February 2008

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: Methanex Motunui Limited
Private Bag 2011
NEW PLYMOUTH

Consent Granted
Date: 29 April 2008

Conditions of Consent

Consent Granted: To discharge contaminants into the air from the Waitara
Valley methanol plant at or about 2618266E-6241201N

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Waitara Valley Methanol Plant, Mamaku Road, Waitara

Legal Description: Lot 1 DP 13541 Blk V Waitara SD

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 [including but not limited to, minimising carbon dioxide emissions] to prevent or minimise any actual or likely adverse effect on the environment arising from emissions from the site. 'Best practicable option' [as defined in section 2 of the Resource Management Act 1991] shall be determined by the Taranaki Regional Council, taking into account the information supplied by the consent holder under condition 4 of this consent, and following review as set out under condition 11 of this consent.
2. The consent holder shall at all times operate, maintain, supervise, monitor and control all processes so that emissions authorised by this consent are maintained at the minimum practicable level.
3. Prior to undertaking any alterations to the plant, processes or operations which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act.
4. The consent holder shall provide to the Chief Executive, Taranaki Regional Council, within three years from the date on which this consent is granted and every three years thereafter a written report:
 - a) reviewing any technological advances in the reduction or mitigation of emissions, especially but not exclusively in respect of potential or actual odorous emissions and the cooling tower plume, how these might be applicable and/or implemented at the Waitara Valley methanol plant, and the costs and benefits of these advances; and
 - b) detailing an inventory of emissions [excluding carbon dioxide] from the methanol distillation tower of such contaminants as the Chief Executive, Taranaki Regional Council may from time to time specify following consultation with the consent holder; and

Consent 4045-3

- c) detailing any measures that have been taken by the consent holder to improve the energy efficiency of the Waitara Valley methanol plant; and
 - d) addressing any other issue relevant to the minimisation or mitigation of emissions from the site that the Chief Executive, Taranaki Regional Council, considers should be included.
5. The consent holder shall control all emissions of methanol to the atmosphere from the site, so as to ensure that maximum ground level concentrations of methanol do not exceed 9 mg/m³ measured as a one hour average under ambient conditions, at or beyond the boundary of the site.
6. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the site, so as to ensure that the maximum ground level concentration of carbon monoxide measured under ambient conditions does not exceed 10 mg/m³ [average exposure over any period of eight hours or longer], or 30 mg/m³ [one hour average], at or beyond the boundary of the site.
7. The consent holder shall control all emissions of nitrogen dioxide or its precursors to the atmosphere from the site, so as to ensure that the maximum ground level concentration of nitrogen dioxide measured under ambient conditions does not exceed 200 ug/m³ [one hour average], or 100 ug/m³ [twenty four hour average], at or beyond the boundary of the site.
8. The consent holder shall control all emissions to the atmosphere from the site of contaminants other than methanol, carbon dioxide, carbon monoxide, and nitrogen dioxide and its precursors, so as to ensure that the maximum ground level concentration for any particular contaminant at or beyond the boundary of the site is not increased above background levels:
 - a) by more than 1/30 th of the relevant Occupational Threshold Value Time Weighted Average, or by more than the Short Term Exposure Limit at any time; or
 - b) if no Short Term Exposure Limited is set, by more than three times the Time Weighted Average at any time [Workplace Exposure Standards effective from 2002, Department of Labour].
9. The discharges authorised by this consent shall not give rise to an odour at or beyond the boundary of the site that in the opinion of at least one enforcement officer of the Taranaki Regional Council, is offensive or objectionable.
10. The discharges authorised by this consent shall not give rise to any significant adverse ecological effect on any ecosystems, including but not limited to habitats, plants, animals, microflora and microfauna.

Consent 4045-3

11. Pursuant to section 128(1)(a) of the Resource Management Act, the Taranaki Regional Council, may review any or all of the conditions of this consent by giving notice of review within six months of the provision of a written report under special condition 4; for the purpose of reviewing the best practicable option or options available to reduce or remove any adverse effects on the environment, or to deal with any significant adverse ecological effect on any ecosystems, including but not limited to habitats, plants, animals, microflora, and microfauna.
12. The exercise and effects of this consent shall be monitored to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.
13. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
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, 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.

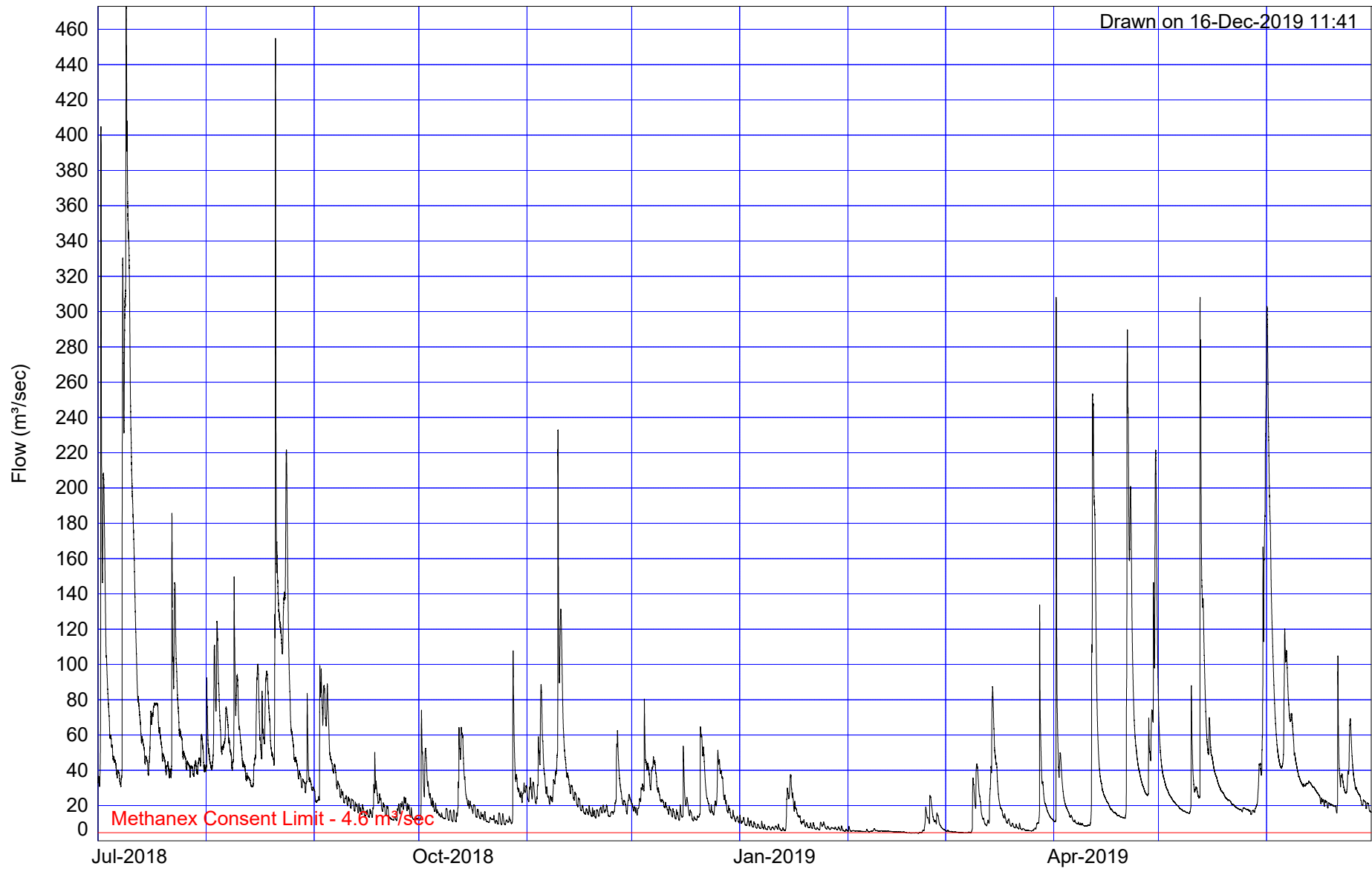
Signed at Stratford on 29 April 2008

For and on behalf of
Taranaki Regional Council

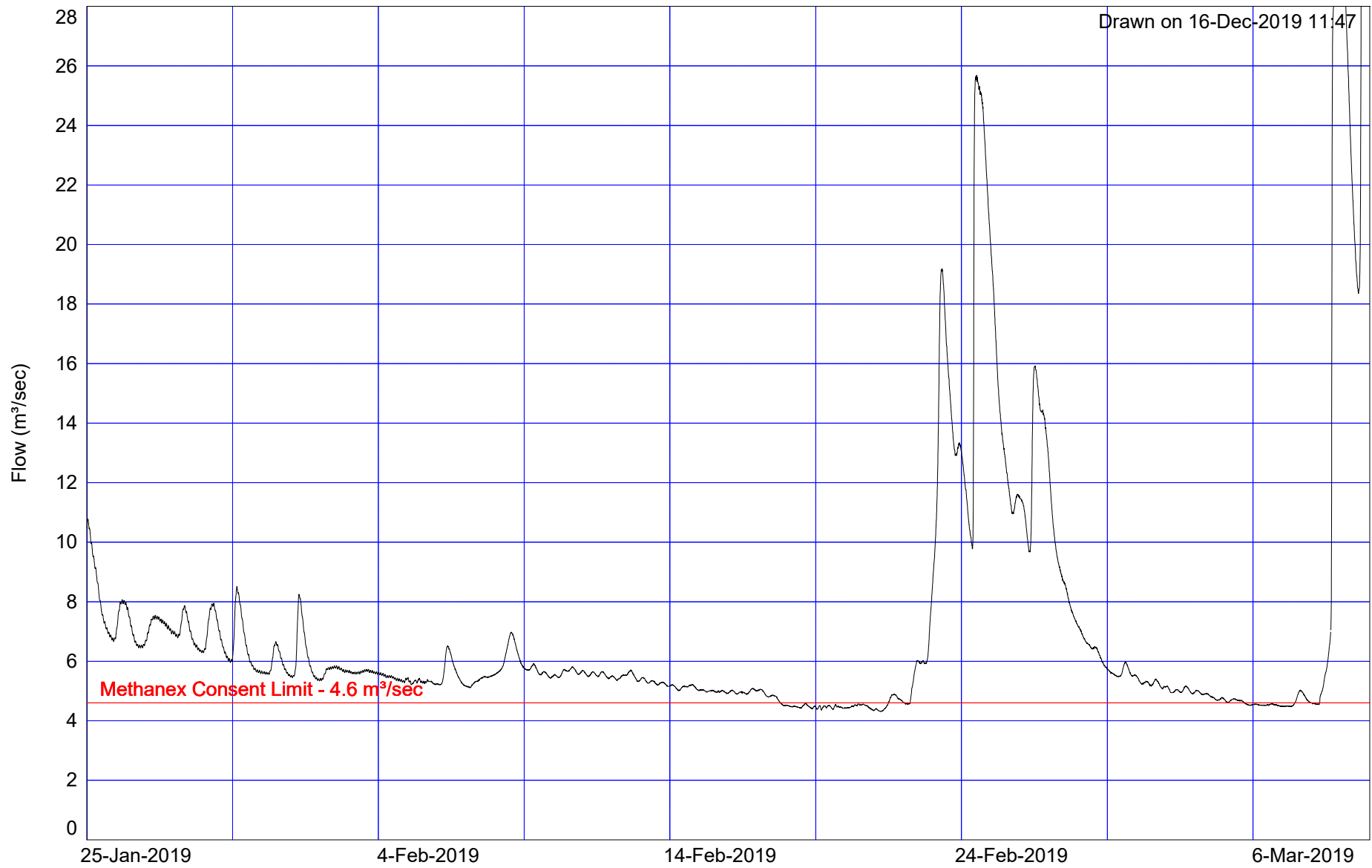
Director-Resource Management

Appendix II

Hydrograph for the Waitara River at Bertrand Road
for the monitoring period July 2018 to June 2019



— Waitara at Bertrand Rd from 1-Jul-2018 00:00:00 to 1-Jul-2019 00:00:00



— Waitara at Bertrand Rd from 25-Jan-2019 00:00:00 to 10-Mar-2019 00:00:00

Appendix III

Biennial Water Use Reduction Report for Methanex NZ Ltd Motunui and Waitara Valley Plants



A RESPONSIBLE CARE® COMPANY

Taranaki Regional Council
Document No:

13 SEP 2018

Document No of Reply:

Private Bag 2011
New Plymouth 4342

T: (06) 754 9700
F: (06) 754 9701

August 8, 2018

Taranaki Regional Council
Private Bag 713
Stratford

Attention: Helen Meintjes

**BIENNIAL WATER USE REDUCTION REPORT FOR METHANEX NZ LTD.
MOTUNUI & WAITARA VALLEY PLANTS
2016/2017 REPORTING PERIOD**

1. Introduction

Methanex New Zealand Ltd is to provide this biennial report to the Taranaki Regional Council to meet conditions in the consents granted for taking water from the Waitara River for use at the Motunui and Waitara Valley plants.

The consents are:

Motunui Plant: 0820-2

Waitara Valley Plant: 0801-2

2. Summary of Plant Operation and Water Use

Motunui Plant:

The Motunui plant produced methanol during all of the 2016/2017 reporting period except during plant shutdowns for maintenance purposes. The consent allows for a water take of 1400 cubic meters per hour; the average take during the reporting period was 882 cubic meters per hour. There is a continuous objective to efficiently use water on site to reduce the amount consumed. This was achieved through a focus on the operation of the plant. Demineralization run lengths were increased at the site which has resulted in less water used for regeneration. There were also increased plant efficiencies from the major maintenance performed on the plant during the planned shutdowns.

Waitara Valley Plant:

The Waitara Valley plant produced methanol during all of the 2016/2017 reporting period except during plant shutdowns for maintenance purposes. The consent allows for a water take of 300 cubic meters per hour; the average take during the reporting period was 175 cubic meters per hour. There is a continuous objective to efficiently use water on site to reduce the amount consumed. This was achieved through a focus on the operation of the plant. Demineralization run lengths were increased at the site which has resulted in less water used for regeneration. There were also increased plant efficiencies from the major maintenance performed on the plant during the planned shutdowns.

3. Conclusion

Both the Motunui and Waitara Valley plants have remained within the consented levels of water extraction from the Waitara River through the reporting period. These plants have taken on average 64% and 58% of the consented amount respectively. Methanex maintains a strong Responsible Care ethic which includes Sustainability principles; in this regard we continue to investigate further ways we are able to reduce the water consumption at both plants. Through the reporting period there has been a reduction in the water consumed through operational and maintenance measures.



Report Prepared by:
Ben Lawn
Environmental Adviser



Approved By:
Gary Rielly
Environmental and Quality Leader

Appendix IV

Raw-water Pipelines' Integrity Inspection Report for Methanex NZ Ltd Motunui and Waitara Valley Plants

07/08/18

Taranaki Regional Council
Private Bag 713
Stratford

Attention: Helen Meintjes

Methanex Raw-water Pipelines' Integrity.

This summary is supplied in acknowledgement of the requirements to verify the integrity of the water pipelines in Water Take Consents for both the Motunui and Waitara Valley Methanol Plants.

The consents were both issued in 2008 and are:

Motunui Plant: 0820-2

Waitara Valley Plant: 0801-2

Assessments and Inspections Carried Out:

In 2017 a project was initiated to replace the air bleed valves on the main water pipeline from the Tikorangi Road intake station to the Motunui plant. Water is also supplied to the Waitara Valley plant from this intake via an offtake pipeline at Bertrand Road. All valves that could be replaced while the pipeline was operational were completed pre- 2018. In April 2018 the pipeline was shut down and drained to allow for the replacement of the remaining valves and carry out inspections of the pipe. During this period video scope inspections were completed on the pipeline in 26 locations to determine the integrity of the system.

The inspection report attached shows there to be no significant issues with the integrity of the pipeline. There was a small piece of concrete lining missing from the top of a riser pipe (Location ABV #3) which was subsequently repaired.



Report Prepared by:
Ben Lawn
Environmental Adviser



Approved By:
Gary Rielly
Environmental and Quality Leader

| | | | |
|--|--|----------|-------------|
|  | <p align="center">PROJECT MANAGEMENT SYSTEM</p> | Document | 8860-PM-004 |
| | | Rev | 0 |

PROJECT BRIEF

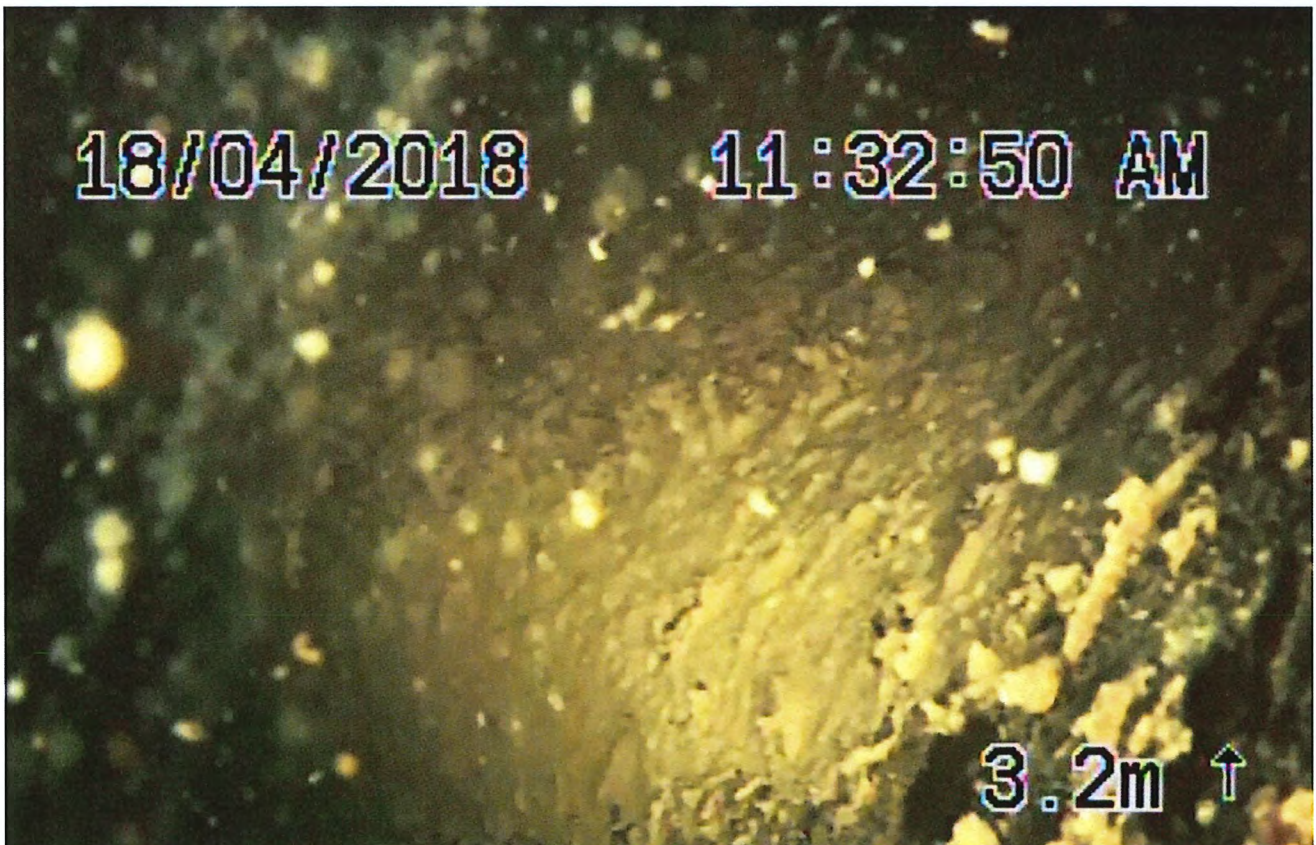
| | | | |
|---------------|--|-------------|---------------|
| CLIENT | Methanex NZ Ltd | PROJECT NO. | 8860 |
| PROJECT TITLE | 003Line ABV Replacements Phase 2 Works | | |
| PROJECT PHASE | ABV Video Scope Inspections | CLIENT REP. | Niki Allerton |
| DATE | 16-20 th April 2018 | CGL REP | Dave Macleod |

INSPECTION FINDINGS

In 2017 Methanex New Zealand Ltd engaged Core Group Ltd (CGL) to replace the air bleed valves on the 003Line. Phase 1 works included the replacement of all valves and fittings that could be completed with the pipeline operational. Phase 2 works included shutting down the pipeline to facilitate the replacement of the remaining valves and fittings. During the replacement activities, video scope inspections were completed at all valve locations where flanges were removed. The video scope inspections for each location commenced above the DN80 pipeline riser flange. The internal inspection included the DN80 pipeline riser, the main section of the DN550 pipeline in the vicinity of the riser and the joint between the pipeline and the riser. The following details summarise the findings at each location:

ABV #1 – DN150

The pipeline was filled with water during the inspection. Moderate levels of organic matter were identified on the riser pipe. Moderate levels of organic material were identified on the pipeline in the vicinity of the riser pipe.



Organic material on the joint between the pipeline and riser pipe.

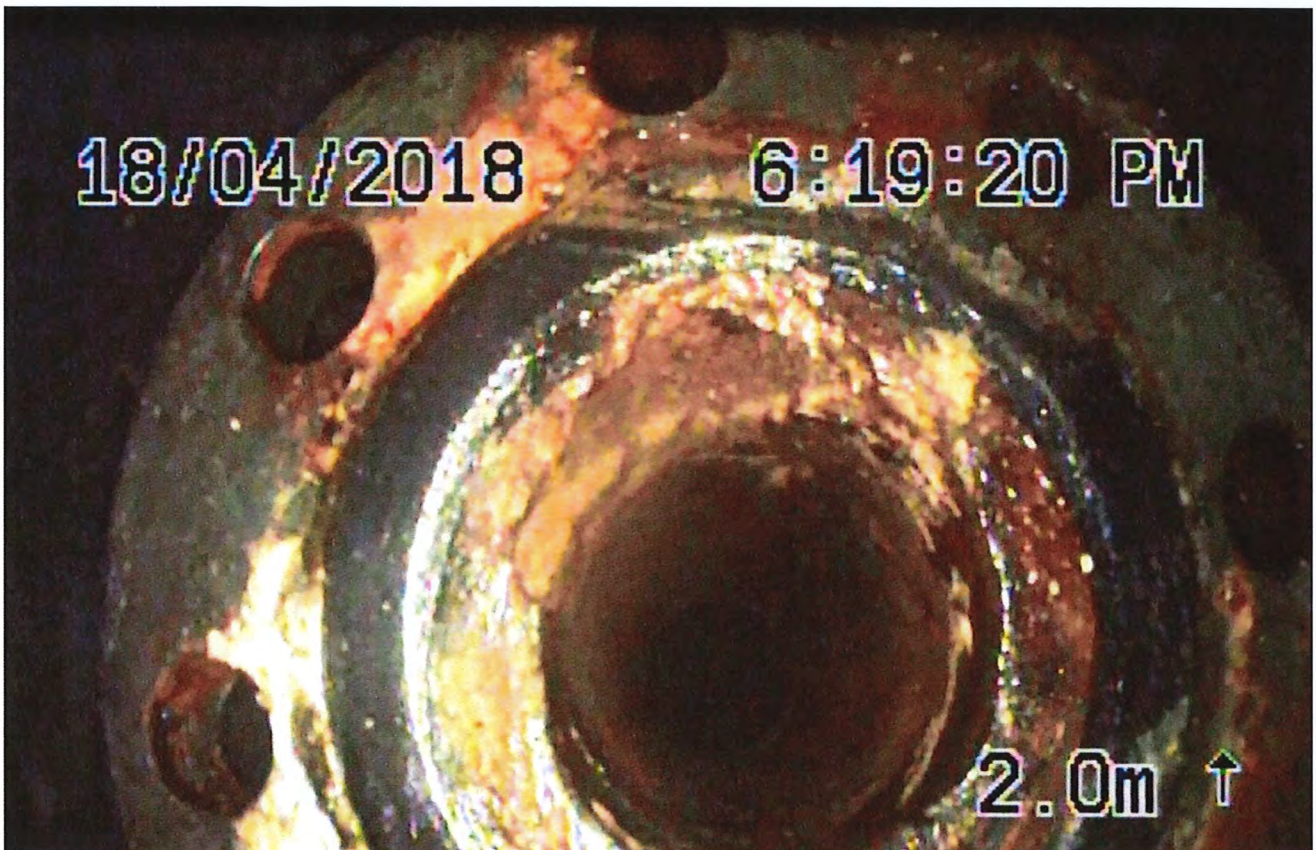
The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #2 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #3 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. A piece of the concrete lining at the top of the riser pipe was missing. This was subsequently repaired by Methanex.



A piece of concrete lining missing from the top of the riser pipe

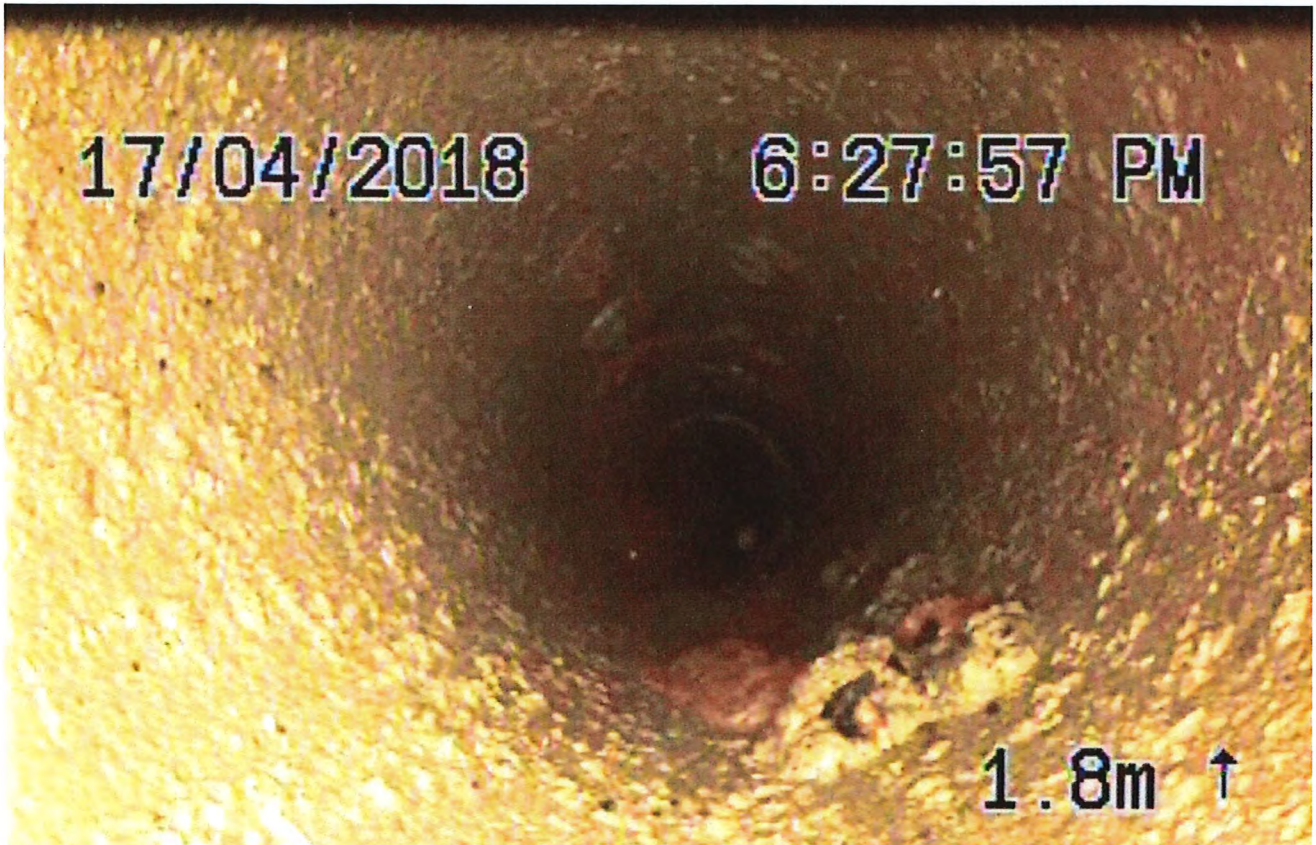
After the riser pipe was repaired, the inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #4 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #7 – DN25

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. However, solid growths were noticed intermittently along the walls of the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe.



Solid growths in the riser pipe

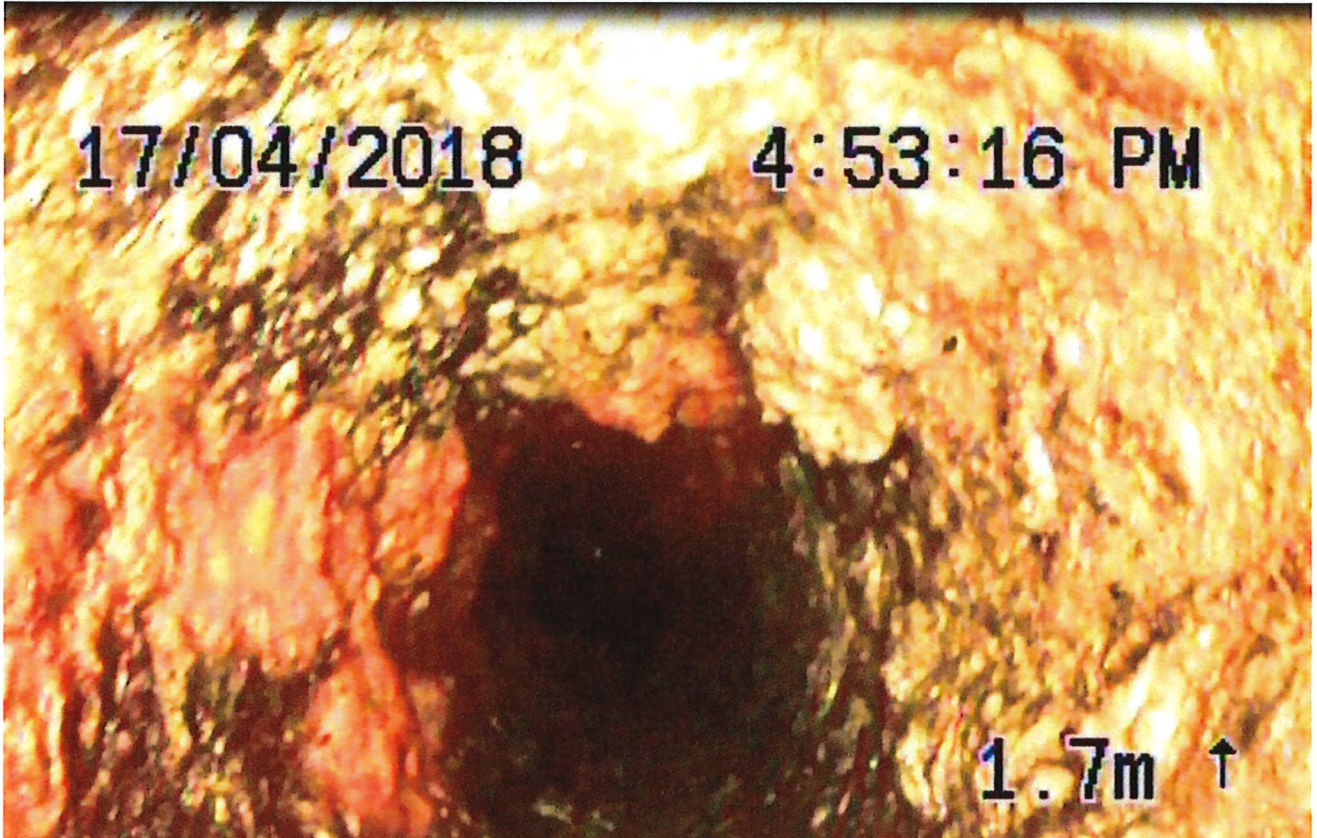
The inspection did not reveal any spalling or cracking of the internal lining of the pipeline. The cause of the solid growths in the pipeline riser could not be confirmed by video scope inspection.

ABV #8 – DN25

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #9 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the main part of the riser pipe. However, excessive solid growths were identified in the riser extension spool. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe.

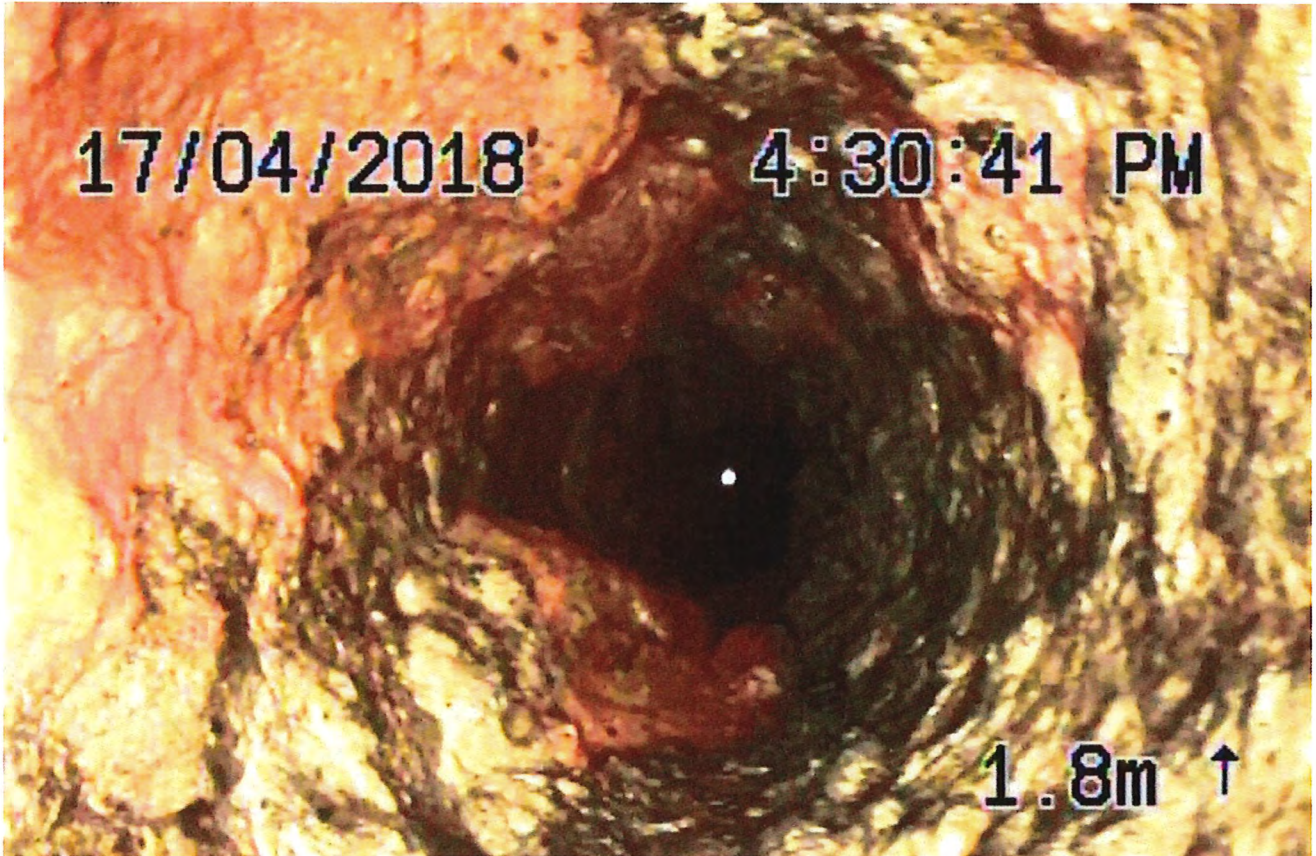


Excessive solid growths in riser extension spool

The inspection did not reveal any spalling or cracking of the internal lining of the pipeline. The cause of the solid growths in the pipeline riser could not be confirmed by video scope inspection.

ABV #10 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the main part of the riser pipe. However, excessive solid growths were identified in the riser extension spool. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe.



Excessive solid growths in riser extension spool

The inspection did not reveal any spalling or cracking of the internal lining of the pipeline. The cause of the solid growths in the pipeline riser could not be confirmed by video scope inspection.

ABV #11 – DN25

The pipeline was filled with water during the inspection. Moderate levels of organic matter were identified on the riser pipe. Moderate levels of organic material were identified on the pipeline in the vicinity of the riser pipe.



Organic material in the riser pipe.

The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #13 – DN25

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. However, solid growths were noticed intermittently along the walls of the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe.



Solid growths in the riser pipe

The inspection did not reveal any spalling or cracking of the internal lining of the pipeline. The cause of the solid growths in the pipeline riser could not be confirmed by video scope inspection.

ABV #14 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #15 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #16 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #17 – DN25

The pipeline was filled with water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #19 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #20 – DN80

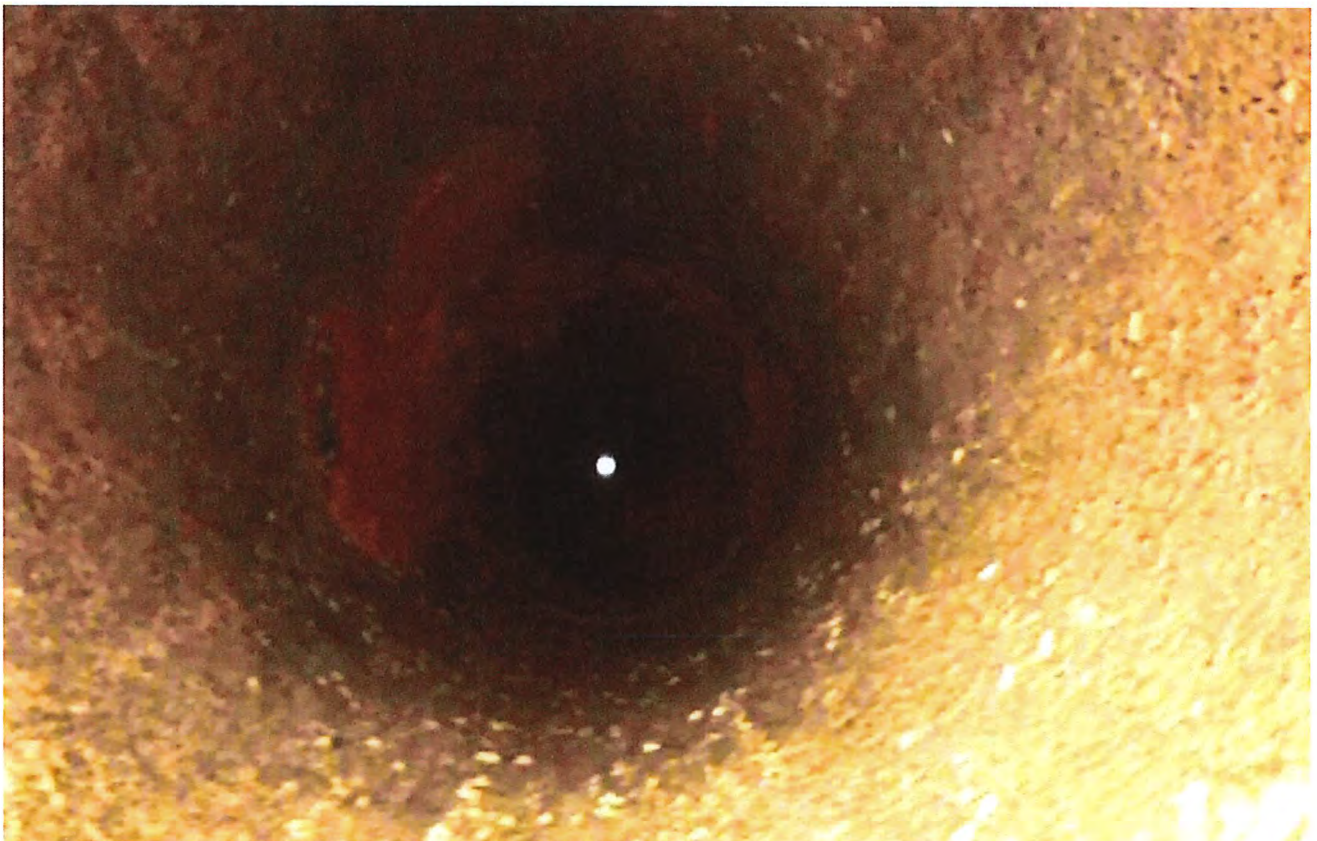
The pipeline was filled with water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #21 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

ABV #23 – DN80

The pipeline was void of water during the inspection. Minor levels of organic matter were identified on the riser pipe. However, solid growths were noticed intermittently along the walls of the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe.



Solid growths in the riser pipe

The inspection did not reveal any spalling or cracking of the internal lining of the pipeline. The cause of the solid growths in the pipeline riser could not be confirmed by video scope inspection.

ABV #26 – DN25

The pipeline was filled with water during the inspection. Minor levels of organic matter were identified on the riser pipe. Minor levels of organic material were identified on the pipeline in the vicinity of the riser pipe. The inspection did not reveal any spalling or cracking of the internal lining of the pipeline.

REPORT COMPLETED BY

| NAME | DAVE MACLEOD | TITLE / POSITION | PROJECT ENGINEER |
|------|--------------|------------------|------------------|
| | | | |

Appendix V

Air Emissions Report for Methanex NZ Ltd Motunui and Waitara Valley Plants





A RESPONSIBLE CARE COMPANY

Taranaki Regional Council
Document No:

13 SEP 2018

Document No of Reply:

Private Bag 2011
New Plymouth 4342

T: (06) 754 9700
F: (06) 754 9701

September 5, 2018

Taranaki Regional Council
Private Bag 713
Stratford

Attention: Helen Meintjes

AIR EMISSIONS REPORT FOR METHANEX NZ LTD. MOTUNUI & WAITARA VALLEY PLANTS

2016/2017 REPORTING PERIOD

Introduction

Methanex New Zealand Limited is required to supply the Taranaki Regional Council with a report every two years for its Motunui plant and every three years for its Waitara Valley plant addressing requirements detailed in the air discharge consents for the sites.

The consents are:

Motunui Plant: 4042-3

Waitara Valley Plant: 4045-3

Methanex is supplying this combined report for both the Motunui and Waitara Valley plants.

Both the Motunui and Waitara Valley plants produced methanol during all of this reporting periods, apart from short-term outages for maintenance purposes.



A RESPONSIBLE CARE COMPANY

Taranaki Regional Council
Document No:

13 SEP 2018

Document No of Reply:

Private Bag 2011
New Plymouth 4342

T: (06) 754 9700
F: (06) 754 9701

September 5, 2018

Taranaki Regional Council
Private Bag 713
Stratford

Attention: Helen Meintjes

AIR EMISSIONS REPORT FOR METHANEX NZ LTD. MOTUNUI & WAITARA VALLEY PLANTS

2016/2017 REPORTING PERIOD

Introduction

Methanex New Zealand Limited is required to supply the Taranaki Regional Council with a report every two years for its Motunui plant and every three years for its Waitara Valley plant addressing requirements detailed in the air discharge consents for the sites.

The consents are:

Motunui Plant: 4042-3

Waitara Valley Plant: 4045-3

Methanex is supplying this combined report for both the Motunui and Waitara Valley plants.

Both the Motunui and Waitara Valley plants produced methanol during all of this reporting periods, apart from short-term outages for maintenance purposes.

Air Emissions Report

[A] Review of Technological Advances to Reduce or Mitigate Emissions

No new technologies for reducing emissions from the plants were identified that are commercially viable during this reporting period. No air emissions related complaint was received from the public, and neither was any objectionable odour noticeable under ambient conditions within the boundaries of the plants during this period.

[B] Inventory of Emissions (excluding carbon dioxide)

No request from the TRC was received for an inventory of any particular contaminants, however Methanex commissioned monitoring and calculations of emissions as per the following tables.

Stack Emissions

| Plant | Date | Production Unit | CO mg/m ³ | NO _x mg/m ³ | SO ₂ mg/m ³ |
|-------------------|----------|--------------------|-------------------------|--------------------------------------|--------------------------------------|
| Motunui | 29/11/17 | Reformer 1 | 1.25 | 309.5 | <LOQ |
| | 29/11/17 | Reformer 2 | 1.3 | 291.5 | <LOQ |
| | | Auxiliary Boiler* | | | |
| Waitara Valley | 28/11/17 | Reformer | 44 | 415.1 | <LOQ |
| | 28/11/17 | Auxiliary Boiler 1 | 349 | 79.7 | <LOQ |
| | 28/11/17 | Auxiliary Boiler 2 | 1.3 | 86.6 | <LOQ |

LOQ for SO₂ is 1ppm

*The Motunui Auxiliary Boiler was not operating during the sampling period

Stack emissions analysis was carried out by Watercare Services Ltd – Air Quality group, using a Combustion Gas Analyser. These analyses were carried out while the plants were operating at >95% production under stable conditions. All results are averages of the samples taken.

[C] Ambient Atmospheric Monitoring

Perimeter monitoring for methanol, carbon monoxide and nitrogen dioxide was carried out in 2016 and 2017 at both sites by Watercare Services Ltd – Air Quality Group and the following tables record these results:

2017 Motunui Site – 29th November

| Parameter | Location North | | Location East | | Location South | | Location West | |
|-----------------------------------|----------------|-------------------|----------------------|-------------------|----------------|-------------------|---------------|-------------------|
| Monitoring period | 10:23 – 11:23 | | 9:20 – 10:20 | | 8:15 – 9:15 | | 11:28 – 12:28 | |
| Wind Direction | North East | | North East | | North East | | North East | |
| Average Wind Speed (m/s) | 1.2 | | 1.9 | | 0.5 | | 0.9 | |
| Average Temperature (°C) | 21.7 | | 20.0 | | 20.0 | | 24.4 | |
| Average Relative Humidity (%) | 64.5 | | 63.5 | | 65.0 | | 61.1 | |
| Average Barometric Pressure (hPa) | 1022.2 | | 1022.2 | | 1021.5 | | 1021.6 | |
| Conditions | Clear | | Clear, partly cloudy | | Cloudy | | Cloudy | |
| Parameter | Location North | | Location East | | Location South | | Location West | |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| CO | 0.81 | 1.01 | 0.46 | 0.58 | 0.35 | 0.44 | 1.25 | 1.57 |
| Unit | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ |
| NO ₂ | 1.31 | 2.69 | 1.48 | 3.04 | 1.84 | 3.76 | 1.42 | 2.91 |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| Methanol | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ |

* The limit of quantification of RAE VOC gas monitor used for logging the Methanol concentration is 0.04 ppm (0.06 mg/m³). The average concentration from the four locations monitored is <0.04 ppm or <0.06 mg/m³. All mass concentrations corrected to 0 °C, 101.3 kPa.

2017 Waitara Valley Site – 28th November

| Parameter | Location North | | Location East | | Location South | | Location West | |
|-----------------------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|
| Monitoring period | 13:01 – 14:01 | | 10:20 – 11:20 | | 9:15 – 10:15 | | 11:55 – 12:55 | |
| Wind Direction | Northerly | | North East | | Easterly | | North East | |
| Average Wind Speed (m/s) | 0.7 | | 0.7 | | 1.8 | | 2.6 | |
| Average Temperature (°C) | 23.6 | | 24.2 | | 20.4 | | 20.6 | |
| Average Relative Humidity (%) | 58.1 | | 65.9 | | 71.2 | | 69.9 | |
| Average Barometric Pressure (hPa) | 1026.0 | | 1026.8 | | 1026.9 | | 1026.4 | |
| Conditions | Clear, partly cloudy | | Clear, partly cloudy | | Clear, partly cloudy | | Clear, partly cloudy | |
| Parameter | Location North | | Location East | | Location South | | Location West | |
| Monitoring period | 15:20 – 16:20 | | 13:14 – 14:14 | | 12:10 – 13:10 | | 14:16 – 15:16 | |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| CO | 0.46 | 0.58 | 0.79 | 0.98 | 1.64 | 2.05 | 0.47 | 0.58 |
| Unit | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ |
| NO ₂ | 4.18 | 8.57 | 2.18 | 4.46 | 3.36 | 6.89 | 10.84 | 22.23 |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| Methanol | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ |

* The limit of quantification of RAE VOC gas monitor used for logging the Methanol concentration is 0.04 ppm (0.06 mg/m³). The average concentration from the four locations monitored is <0.04 ppm or <0.06 mg/m³. All mass concentrations corrected to 0 °C, 101.3 kPa.

2016 Motunui Site – 21st November

| Parameter | Location North | | Location East | | Location South | | Location West | |
|-----------------------------------|----------------|-------------------|---------------|-------------------|----------------|-------------------|---------------|-------------------|
| Monitoring period | 08:42 – 09:42 | | 09:45 – 10:45 | | 10:47 – 11:47 | | 07:40 – 08:40 | |
| Wind Direction | Westerly | | Westerly | | Westerly | | Westerly | |
| Average Wind Speed (m/s) | 2.1 | | 4.8 | | 1.9 | | 2.8 | |
| Average Temperature (°C) | 17.3 | | 17.5 | | 20.7 | | 17.0 | |
| Average Relative Humidity (%) | 62.4 | | 52.6 | | 50.9 | | 64.0 | |
| Average Barometric Pressure (hPa) | 1017.0 | | 1017.0 | | 1016.2 | | 1017.0 | |
| Conditions | Clear | | Clear | | Clear | | Clear | |
| Parameter | Location North | | Location East | | Location South | | Location West | |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| CO | 0.52 | 0.65 | 1.63 | 2.04 | 1.28 | 1.59 | 0.66 | 0.83 |
| Unit | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ |
| NO ₂ | 7.57 | 15.51 | 45.74 | 93.76 | 38.15 | 78.21 | 16.94 | 34.74 |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| Methanol | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ |

* A probable cause for the unusual results NO₂ and CO at Motunui site is the methanol plant being restarted at the time with flaring occurring throughout this period.

** The limit of quantification of RAE VOC gas monitor used for logging the Methanol concentration is 0.04 ppm (0.06 mg/m³). The average concentration from the four locations monitored is <0.04 ppm or <0.06 mg/m³.

All mass concentrations corrected to 0 °C, 101.3 kPa.

2016 Waitara Valley Site – 21st November

| Parameter | Location N | | Location E | | Location S | | Location W | |
|-----------------------------------|----------------|-------------------|---------------|-------------------|----------------|-------------------|---------------|-------------------|
| Monitoring period | 15:20 – 16:20 | | 13:14 – 14:14 | | 12:10 – 13:10 | | 14:16 – 15:16 | |
| Wind Direction | Westerly | | Westerly | | Westerly | | Westerly | |
| Average Wind Speed (m/s) | 3.4 | | 4.1 | | 3.2 | | 4.5 | |
| Average Temperature (°C) | 19.6 | | 21.1 | | 20.5 | | 21.7 | |
| Average Relative Humidity (%) | 61.2 | | 45.9 | | 43.0 | | 62.7 | |
| Average Barometric Pressure (hPa) | 1018.2 | | 1017.5 | | 1018.0 | | 1017.0 | |
| Conditions | Sunny | | Sunny | | Sunny | | Sunny | |
| Parameter | Location North | | Location East | | Location South | | Location West | |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| CO | 0.11 | 0.13 | 1.41 | 1.77 | 0.89 | 1.11 | 0.34 | 0.43 |
| Unit | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ | ppb | µg/m ³ |
| NO ₂ | 47.31 | 96.99 | 46.74 | 95.82 | 52.75 | 108.14 | 51.59 | 105.76 |
| Unit | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ | ppm | mg/m ³ |
| Methanol | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ | <LOQ |

*A probable cause for NO₂ and CO at Waitara Valley site being high is due to a neighbouring farm having a burn-off which resulted in large amount of smoke migrating through the plant.

** The limit of quantification of RAE VOC gas monitor used for logging the Methanol concentration is 0.04 ppm (0.06 mg/m³). The average concentration from the four locations monitored is <0.04 ppm or <0.06 mg/m³.

All mass concentrations corrected to 0 °C, 101.3 kPa.

Motunui Site Ambient Monitoring Points

Site map Motunui site showing the location of ambient monitoring points

