

Methanex Motunui and Waitara Valley
Combined Monitoring Programme
Annual Report
2016-2017

Technical Report 2017-104

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Executive summary

Methanex New Zealand Limited (Methanex) operates methanol production facilities located at Motunui and Waitara Valley, in the Waitara River catchment. This report for the period July 2016 to June 2017 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess Methanex's environmental 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, two inter-laboratory comparisons and an onsite meeting relating to the requirements of the *Resource Management (for Measurement and Reporting of Water Takes) Regulations 2010*.

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.

There were three unauthorised incidents recording non-compliance in respect of Methanex's activities at their Motunui and Waitara Valley sites during the period under review. The first was in regards to meeting the requirements of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010* requiring the installation of verified flow meters at both points of take. The other two incidents were self notifications received from the consent holder. One related to a drop in cooling water pH that affected the metal content in the discharge to the marine outfall from the Waitara Valley site. The other was a discharge of cooling water across land to stormwater as a result of a failed pump. Both incidents were considered to be reasonably unforeseeable and related to mechanical failures or unanticipated issues at the site. In addition both events were adequately responded to by Methanex. For this reason no enforcement response was considered appropriate or necessary.

During the year, Methanex demonstrated a High level of environmental performance with the resource consents at both facilities. Their administrative performance has been rated as Good, as although the performance against most consent conditions with respect to the administrative compliance was high, issues around testing of the integrity of the water take pipeline and meeting the requirements of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010* are yet to be resolved. Methanex have been open and participative in their communication with regard to their progress on these issues.

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21% 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 Methanex's environmental performance remains at a high level in the year under review.

This report includes recommendations for the 2017-2018 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 2016 to June 2017 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). Both sites are situated in the Waitara River catchment. Together, these 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 the Methanex's use of water, land and air.

The Council began reporting its monitoring of Methanex in 1990. This report is the 37th 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 in the Waitara River catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Company'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 2017-2018 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 significant 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 in response to unauthorised incident reports, 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 in response to unauthorised incident reports. 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 in response to unauthorised incident reports. 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 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21% of the consents, a good level of environmental performance and compliance was achieved.

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 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 Limited (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 Limited 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

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. Methanex currently holds a consent for a flood control structure in the Waitara River.

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. Methanex currently holds two abstraction consents for the Waitara River.

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. Methanex currently holds six water discharge consents.

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. Methanex currently holds two air discharge consents.

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. Methanex no longer holds a consent for the discharge of contaminants onto land as its sludge disposal is undertaken as a permitted activity under the Regional Freshwater Management Plan.

A summary of the consents presently held by Methanex in relation to activities at its Motunui and Waitara Valley sites is given in Table 1 below. Where separate consents are held for the same activity at the different sites, these consents typically share similar or identical conditions. Further detail on Methanex's consents is provided in section 2 and 3 of this report. A copy of each of the consents can be found in Appendix I.

Table 1 Summary of consents presently held by Methanex

Consent	Purpose	Site to which the consent relates
0820-2	Water take from Waitara River	Motunui
0822-2	Discharge uncontaminated stormwater to Waihi and Manu streams	Motunui
0825-3	Discharge uncontaminated stormwater to an unnamed tributary of the Waitara River	Motunui, at the Motunui intake
0827-3	Discharge wastewater to an unnamed tributary of the Waitara River	Motunui, at the Motunui intake
3400-2	Discharge treated wastewater and stormwater to the Tasman Sea	Motunui
4042-3	Discharge contaminants to air	Motunui
0801-2	Water take from Waitara River at two locations	Waitara Valley
0802-2	Discharge stormwater to the Waitara River	Waitara Valley
3399-2	Discharge treated wastewater and stormwater to the Tasman Sea	Waitara Valley
3960-2	Construct rock groyne in the Waitara River	Waitara Valley
4045-3	Discharge contaminants to air	Waitara Valley

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets out obligations upon the Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising within the Taranaki region and report upon these.

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 reviews;
- renewals;
- new consents;
- 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 for the purpose of site inspections. Site visits mainly involved compliance inspections and the taking of 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. Details of the reports received during the 2016-2017 monitoring year (which relate to both sites) may be found in the Motunui and Waitara Valley results sections of this report.

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 May 2016 and addresses the monitoring, developments and investigations undertaken in 2014 and 2015. The next report is expected in 2018 to cover the 2016 and 2017 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.

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 the 2015-2016 monitoring period. These reports cover developments and initiatives over the two preceding 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 new requirement of consent 0820-2 and 0801-2 (granted in April 2008). The first report was due in 2013.

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. No changes were required.

Marine outfall

Every five years Methanex is required to supply Council with 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 due in 2013. Methanex have had discussions with Council with regard to this work due to a number of issues. This report was received during the 2013-2014 monitoring period. The next report is due in 2018.

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 and Waitara Valley methanol sites were taken by the Council and Methanex simultaneously. 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. 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 was removed later after drying out over the 2007 summer. All of the sludge was disposed of at Redvale Landfill at that time.

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 will be 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 when the site recommenced production. 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.

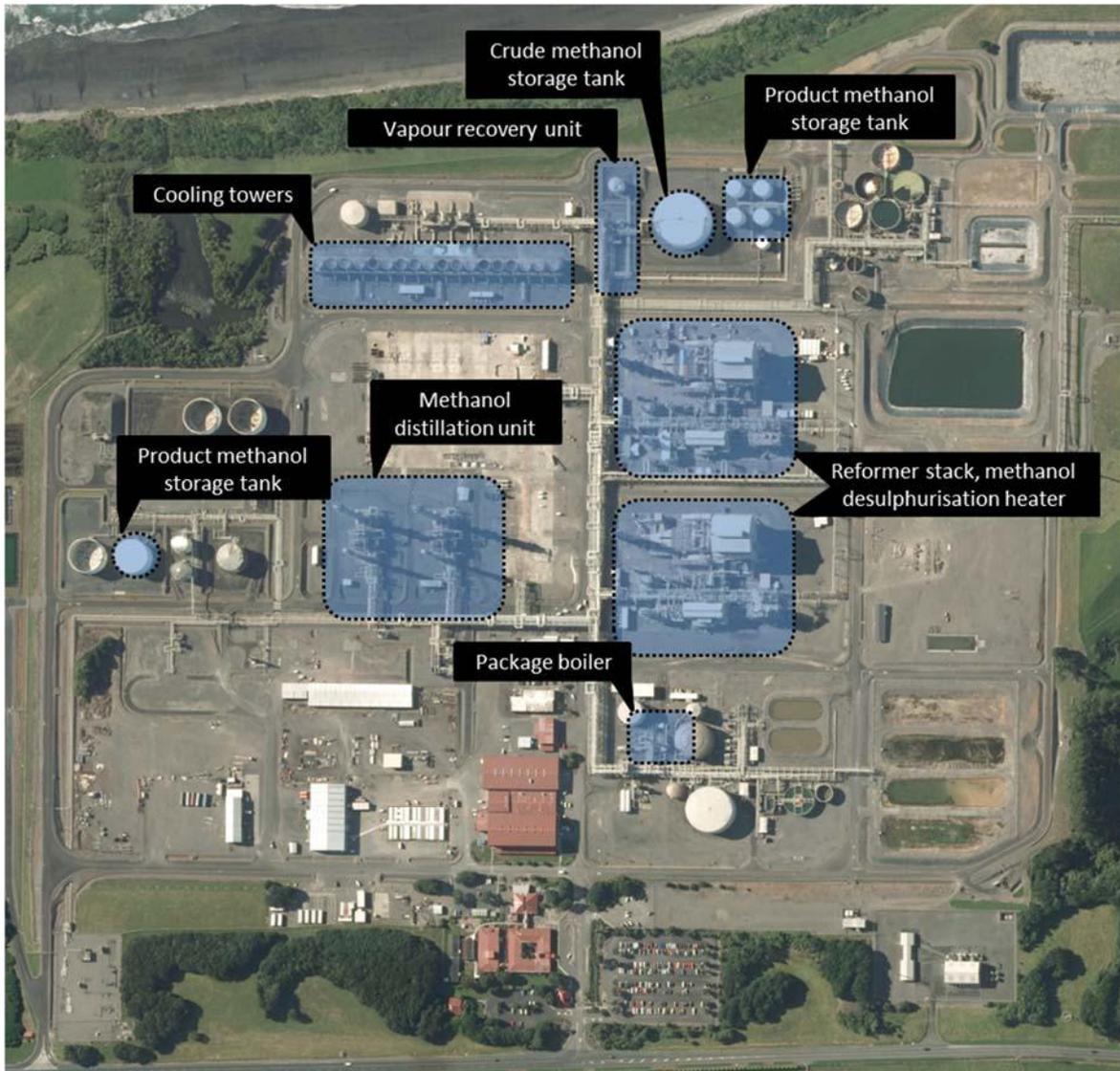


Figure 2 Major process air emission sources at Motunui

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. The solid wastes are placed in the sludge lagoons at the south eastern corner of the site and are allowed to dry. 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. The last sludge disposal occurred in 2000.

In 2004 the majority of the sludge disposal area was sold to Shell Todd Oil Services and has since been used as part of the Pohokura production station development. With the restart of Motunui, 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 Resource consents

Methanex currently holds six resource consents for the operation of its Motunui petrochemical plant. A summary of the requirements imposed by each of the consents is provided in Sections 2.2.1 to 2.2.4 and copies of the resource consents are included in Appendix I.

A list of the consents currently held by Methanex during the monitoring period in relation to the Motunui site is given in Table 3 below.

The early consents for this site were granted to New Zealand Synthetic Fuels Corporation Limited as National Development (New Zealand Synthetic Fuels Corporation Limited) Order 1982 under the *National Development Act 1979*. In May 1993, the consents were transferred to Methanex Motunui Limited, following the merger of Fletcher Challenge Methanol and Methanex Corporation Canada.

Table 3 Consents held in relation to the Motunui site, July 2016 - June 2017

Consent	Granted	Review date	Expiry date	Purpose	Volume (m ³ /day)
0820-2	29/04/08	30/06/15	1/06/21	Water take from Waitara River	33,600
0822-2	29/11/12	1/06/15	1/06/27	Discharge uncontaminated stormwater to Waihi and other streams from the Motunui plant	-
0825-3	31/03/08	1/06/15	1/06/21	Discharge stormwater at the Motunui intake facility	-
0827-3	31/03/08	30/06/15	1/06/21	Discharge wastewater at the Motunui intake facility	1,000
3400-2	29/04/08	30/06/15	1/06/21	Discharge treated plant effluent and contaminated stormwater to Tasman Sea	12,096
4042-3	12/02/08	30/06/18	1/06/28	Discharge to air from methanol and gasoline manufacture	-

Historical consents

Consents 3400, 0820, 0825, 0827 and 4042 were due to expire during 2008 and 2009. These consents were renewed in 2008. Consent 0822 expired and was renewed in 2012. Consents 1244 and 1245 related to taking groundwater and discharging groundwater to the Waihi and other streams for the purpose of ground stabilisation and protecting the site against seismic hazards. Methanex ceased exercising this consent on 5 December 2004 and with current scientific knowledge, the abstraction is no longer considered necessary for stability of the site during seismic activity. These consents expired in 2009 and were not renewed. Redundant infrastructure pertaining to this consent may still be seen around the Motunui site.

Consents 4543 and 4640 related to air emissions from the methanol distillation process. These were surrendered by Methanex as they were superseded by the new air discharge consent 4042-3.

Summaries of consent conditions

In the sections that follow, summaries of Methanex's Motunui consent conditions are provided. It should be noted that these summaries may not reflect the full requirements of each condition. The consent conditions in full may be found in the resource consents which are appended to this report.

2.2.1 Water abstraction permits

Methanex holds one consent to abstract surface water for use at the Motunui site as described below.

Consent 0820-2: Abstraction from Waitara River

Methanex holds water permit 8020-2 for the abstraction of water from the Waitara River for use in the Motunui methanol production plant. This permit was issued by the Council on 29 April 2008 under Section 87(d) of the RMA. It is due to expire on 01 June 2021.

The point of abstraction is on the true right bank, 10 km from the sea. River flow volumes are measured at the Bertrand Road gauging site two kilometres downstream of the abstraction point.

The original Consent 0820-1 was granted in October 1981. A variation to the consent was granted in December 1986, permitting an additional 130 l/s. Additional requirements imposed by the conditions of the variation related mainly to monitoring and provision of information. Consent 0820-1 expired on 12 March 2009 and was superseded by renewed consent 0820-2.

A further variation to this consent was granted on 15 November 2005 to allow Methanex to supply water abstracted under this consent to Shell Todd Oil Services for their horizontal directional drilling associated with the development of the Pohokura field. The purpose of the varied consent was changed, however the conditions of the consent remained the same.

Consent 0820-2 includes seven special conditions.

Special conditions 1 and 2 of this renewed consent set out a maximum rate of abstraction of 1,400 m³/hr (approximately 390 l/s) when the flow rate of the Waitara River measured at Bertrand Road is greater than 4,600 l/s. No water is to be taken when the river falls below this level.

Special condition 3 requires the installation and maintenance of a water meter and specifies the technical requirement around this.

Special condition 4 requires the consent holder to avoid, remedy and mitigate any adverse effects as a consequence of exercising the consent.

Special condition 5 requires screening of the intake structure to prevent the entrainment of fish.

Special condition 6 and 7 are lapse and review provisions.

2.2.2 Water discharge permits

Methanex currently holds four consents to discharge water from the Motunui site, as described below.

Consent 0822-2: Discharge of uncontaminated stormwater to an unnamed tributary of the Waihi Stream

Consent 0822-1 expired in March 2012 and a renewal, consent 0822-2 presently provides for the discharge of stormwater from the site. This permit was issued by the Council on 29 November 2012 under Section 87(e) of the RMA. It is due to expire on 1 June 2027. The original consent 0822-1 was granted on 25 May 1981.

Special condition 1 of the original consent required that any stormwater originating from process or tankage areas, or areas where the level of contamination or likely contamination is significant, shall be retained in the stormwater holding pond for treatment and discharge via the marine outfall.

In 2005, during the period that the site was not operating, Methanex sought a change in special condition 1 of consent 0822-1. This was to allow for free draining of uncontaminated stormwater from the entire site as the site power was to be isolated and all other services to the site disconnected or decommissioned including the on-site wastewater treatment plant.

The requested change of wording to the condition enabled stormwater from the listed areas to be discharged into the Waihi and other streams but ensured that if or when the site was operating again, the stormwater would be treated and discharged via the marine outfall.

With the renewed activity at the site, all stormwater from the processing and tankage area is again controlled in holding ponds and discharged via the marine outfall at Waitara.

Through the renewal of this consent the number of special conditions was reduced from 26 to nine. The pH range was changed from 6.5-9.3 to 6-9.5 following discussions with Council regarding the natural fluctuations of pH. In addition the consent defines the catchment areas for the collection of stormwater as: 240,000 m² for the tributary of the Waihi Stream and 294,000 m² for the Duck Pond which feeds the Manu Stream.

Special condition 1 requires that the best practicable option is adopted at all times.

Special condition 2 specifies the catchment area.

Special condition 3 requires the maintenance of a contingency plan.

Special condition 4 requires the preparation of a stormwater management plan.

Special condition 5 requires that the constituents of the discharge shall meet certain standards.

Special conditions 6 and 7 place restrictions on changes in water quality of the tributaries of the Waihi Stream or Manu Stream.

Special condition 8 relates to changes in chemical use or processes around the site that could affect the nature of the discharge.

Special condition 9 is a review provision.

[Consent 0825-3: Discharge of stormwater from water supply headworks to Waitara River tributary](#)

The original consent (consent 0825-1) granted in 1982, provided for the discharge of up to 2,000 m³/day of stormwater, including emergency water treatment plant overflow, from a water supply headworks to an unnamed tributary of the Waitara River off the end of Tikorangi Road. The stormwater enters the small tributary via an energy dissipation structure about 50 metres from the river. A new consent was issued on 8 September 1993 for a period until 12 March 2009. That consent was again renewed in March 2008 (consent 0825-3). It contained a provision allowing review in 2015 and will expire in 2021. Consent 0825-3 differs from the earlier consent in that it does not limit the volume or rate of water discharged but instead limits the increase in turbidity of the receiving waters to no more than a 50% increase after reasonable mixing.

Special condition 1 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 2 requires that the consent be exercised in accordance with the documentation supplied in support of the application.

Special condition 3 limits an increase in turbidity in receiving waters.

Special condition 4 and 5 are lapse and review provisions.

[Consent 0827-3: Discharge of wastewater from water supply headworks to Waitara River tributary](#)

The original consent was granted in 1982 and a new consent was issued on 8 September 1993 for a period until 12 March 2009. Consent 0827-2 provided for the discharge of up to 1,000 m³/day of wastewater containing settled solids, including solids generated by cleaning a water supply line, from a water supply headworks to an unnamed tributary of the Waitara River off the end of Tikorangi Road. The wastewater enters the small tributary via an energy dissipation structure about 50 metres from the river.

A special condition in consent 0827-2 required that the timing of scouring or cleaning operations coincide with periods of high turbidity in the river. In contrast, the current renewed consent (consent 0827-3) requires a limit of a 50% increase in turbidity as measured in NTU after a reasonable mixing zone in the receiving waters. The consent was renewed as consent 0827-3 on 31 March 2008 with the intention of a review in 2015 and expiry in 2021.

Special condition 1 limits the maximum daily discharge to 1,000 m³/day.

Special condition 2 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 3 requires that the consent be exercised in accordance with the documentation supplied in support of the application.

Special condition 4 limits an increase in turbidity in receiving waters.

Special condition 5 is a review provision.

Consent 3400-2: Discharge of plant effluent to Tasman Sea

Coastal consent 3400-2 provided for the discharge of up to 12,096 m³/day of treated wastewater and stormwater from the manufacture of methanol and synthetic gasoline. The discharge is into the Tasman Sea via a pipeline extending about 1,250 metres off shore from the Waitara River mouth. The maximum rate of discharge is 140 l/s. The previous consent 3400-1 also provided for inclusion of up to 1,000 m³/year of treated water draw-off from gasoline storage tanks at the Omata tank farm, however this has been removed from the consent 3400-2 granted in 2008.

The consent was varied on 18 July 2012 following problems that year with restricting levels of the bacterium *Legionella* to safe numbers (<10 cfu/100 ml). The variation included a new condition to allow the maximum daily limit of the water treatment chemical 'Spectrus CT1300' to be increased to 40 kg/day if a spike in the numbers of the bacteria *Legionella* is detected. This was to ensure that future outbreaks of *Legionella* could be effectively controlled and also allowed for increased dosing when the Methanol 1 production unit was brought online. The variation was granted on 18 July 2012 and the consent is due to expire in June 2021.

Special condition 1 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 2 requires the consent holder to keep records of the volume of effluent and provide these to the Council on a monthly basis.

Special condition 3 limits the volume and rate of the discharge.

Special condition 4 requires a minimum initial dilution factor to be met.

Special condition 5 limits the concentration of suspended solids.

Special condition 6 and 7 require certain water quality parameters to be met.

Special condition 8 limits what water treatment chemicals may be used and their relative dosing limits.

Special conditions 9 to 12 and 14 discuss the requirements of Methanex to advise the Council of any proposed changes in water treatment or cleaning chemicals, or equivalent chemicals, in order that limitations may be placed on their discharge, if necessary, for protection of the receiving waters.

Special condition 13 specifies the sampling point for condition 5, 6, 7 and 8.

Special condition 15 outlines what effects the discharge may not give rise to after a mixing zone of 200 metres.

Special condition 16 requires a contingency plan, to be maintained and put into operation in the event of spillage, accidental discharge, or pipeline failure.

Special condition 17 states discharge of domestic sewage is not a permitted activity under this consent.

Special condition 18 requires Methanex to notify the Council at least seven days prior to the consent first being exercised.

Special conditions 19 and 20 require reports to be received from Methanex. Methanex must certify the structural integrity and dilution performance of the outfall at least every five years. An annual report on the performance of the effluent disposal system is also required and must detail compliance with conditions of the consent.

Special conditions 21 and 22 deal with the lapse and the review provisions of the consent.

Other consents to discharge from the Waitara marine outfall

Historically consent 3400 was one of several resource consents that provide for the discharge of wastes via the Waitara marine outfall. Methanex had originally planned to have its own marine outfall. The local iwi, Te

Atiawa, fought against this decision, and won a change to have the effluent discharged through a renovated joint outfall at the mouth of the Waitara River.

In recent years, the discharges at the outfall have originated from three sources, these being the two Methanex sites and the WWWT. The latter was constructed in 1991 and 1992 by NPDC and AFFCO (a meat-works Company which used the outfall until 1997). It was used to treat both domestic and meat-works effluent which had previously been discharged through the outfall with minimal treatment.

During the 2014-2015 monitoring period, NPDC completed work towards the conversion of the WWWT to a transfer pump station (and associated pipeline infrastructure) that redirects wastewater to the NPWWTP. The marine outfall is no longer used by NPDC for the regular discharge of treated wastewater. Therefore for the current monitoring period only Methanex holds resource consents to regularly discharge treated process water from its two sites, via the Waitara marine outfall, and this discharge presently contains no sewage. NPDC however still holds a consent for the discharge of partially treated municipal sewage. This consent is only to be exercised as a contingency during unusually high volume flows of wastewater, such as exceptional stormwater infiltration, that cannot physically be piped through to the NPWWTP.

NPDC is now the owner and administrator of the outfall, and Methanex has a contract in place with NPDC for access to discharge through it. NPDC retains responsibility for the maintenance of the outfall. During 1991, a refurbishment of the outfall was undertaken to provide a 25 year life period and to improve the initial dilution. This process included the insertion of an impervious plastic liner through the pipeline, improvement of the stability of the pipeline on the seabed, and installation of a new diffuser.

Key discharge consents that have been associated with the Waitara marine outfall are summarised in Table 4 below.

Table 4 Discharges from the Waitara marine outfall

Consent	Consent holder	Effluent source	Volume m ³ /day	Current status
3397-2	New Plymouth District Council	Treated domestic, minor industrial and stormwater	11,950 (previously 7,258)	This consent was surrendered upon completion of the redirection of waste to NPWWTP as well as the completion of required compliance monitoring.
7862-1	New Plymouth District Council	Screened and disinfected municipal wastewater	Limited period not volume	The discharge was permitted during conversion of the WWWT to the Waitara pump station. Since the conversion has occurred, no further discharges under this consent are permitted.
7861-1	New Plymouth District Council	Screened untreated municipal wastewater	Limited period not volume	This consent became active upon the commencement of pumping to the NPWWTP. This discharge is only permitted in the event of high rainfall events when the instantaneous inflow to the Waitara pump station exceeds 280 l/s, or when the inflow to the pump station exceeds 18,800 m ³ in the previous 24-hour period, or when the storage tanks at the Waitara pump station are full and the inflow to the Waitara pump station exceeds the transfer pumping rate of 140 l/s.
3398-2	Anzco Foods Waitara Limited	Treated wastes arising from food manufacturing and associated activities	12,960	As of July 2009, Anzco Foods Waitara Ltd discharge under a trade waste agreement with NPDC. They withdrew their application for consent renewal on 23 July 2010.

Consent	Consent holder	Effluent source	Volume m ³ /day	Current status
3399-2	Methanex Motunui Limited	Methanol plant (Waitara Valley)	5,000	Presently exercise this consent.
3400-2	Methanex Motunui Limited	Methanol plant (Motunui)	12,096	Presently exercise this consent.

2.2.3 Air discharge permits

Methanex holds one air discharge consent for the Motunui site.

Consent 4042-3: Discharges to air from the Motunui methanol plant

Methanex holds air consent 4042-3, to cover the discharge of emissions to air from activities associated with the production of methanol (and previously gasoline) at the Motunui site.

The Council issued this permit on 23 March 1994 as a resource consent under Section 87(e) of the RMA. A minor variation to remove requirements relating to carbon dioxide emissions was granted on 6 April 2005. It was due to expire on 1 June 2009 but has been renewed, the new consent (4042-3) commenced on 12 February 2008 and expires in June 2021.

There are 17 special conditions attached to this consent.

Special condition 1 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 2 requires that the consent be exercised in accordance with the documentation supplied in support of the application.

Special condition 3 requires that emissions are minimised.

Special condition 4 sets out requirements if certain alterations are made to the site.

Special condition 5 requires that the consent holder commission reports detailing the technology available in regards to minimisation of the adverse effects of the water vapour plume from the cooling tower. These are to be supplied to the Council every five years.

Special condition 6 requires that another report be prepared and supplied to the Council every two years detailing how emissions from the site may be minimised or mitigated and containing an inventory of these emissions. It also requires that improvements in energy efficiency be detailed in the report.

Special condition 7 to 10 limits the ground level concentrations of methanol, carbon monoxide, and nitrogen dioxide.

Special condition 11 requires that the consent holder compile and maintain an inventory of emissions discharged from the site and include this with the reporting set out in special condition 6.

Special condition 12 restricts offensive or objectionable odour at or beyond the property boundary.

Special condition 13 restricts significant adverse ecological effects.

Special condition 14 – 17 refer to the monitoring, review and lapse of the consent.

2.2.4 Discharge of wastes to land

Methanex currently does not hold any consents to discharge sludge waste onto or into land, all sludge is currently held in purpose-built lagoons for dewatering and later disposed of appropriately to land as permitted by Rule 29 of the Regional Fresh Water Plan for Taranaki (RFPW).

2.3 Results

2.3.1 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 15 September, 07 December 2016, 16 March and 15 June 2017 as well as two compliance monitoring sampling visits for the purpose of collecting a split sample on 08 November 2016 and 16 June 2017.

During the compliance monitoring site inspections, various areas of the site were observed. This typically included sighting 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. Inspecting 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.

15 September 2016

An inspection of both the Motunui and Waitara Valley sites 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 with no off-site emissions or discharges detected.

Methanex personnel advised that the relining of the off-spec pond was still on hold while the HDPE lining of the methanol storage tanks bunds was now complete.

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

07 December 2016

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.

Methanol 2 production unit was temporarily shutdown for repair. Overall the site was managed well with no off-site emissions or discharges detected.

16 March 2017

An inspection of the Motunui and Waitara Valley facilities, as well as the intake structure (Plant 61) 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 with no off-site emissions or discharges detected.

At the time of inspection it was noted that the old off-spec pond liner had been removed and contractors were making a start replacing the new liner. Rolled up sections of old liner appeared to be dry and free of organic matter and awaiting land disposal approval.

Within the water treatment area (Plant 37), staff advised that the Sulphuric Acid tank had been refurbished and was now back in service.

The intake facility was found to be in a good and tidy condition. Methanex personnel advised that divers were scheduled to carry out an inspection of the inlet chambers when river conditions would next allow. It was noted that excavation work around the pipeline section where the existing water meter was to be verified had commenced.

15 June 2017

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

The plant was in its sixth week of shutdown during the inspection. Preparations were underway for operations to restart in the next week. The inspecting officer noted that there had been no issues with catalyst changeovers or heat exchangers replacement.

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

The off-spec pond re-lining had been fully undertaken with only some pipework to be completed before recommissioning.

Methanex personnel advised that refurbishing of the cooling towers was scheduled for later in the year.

Flushing out and repainting of the methanol storage tanks was underway at the time of the inspection.

2.3.2 Production shutdowns

The following schedule of production unit shutdowns was received from Methanex for the Motunui site (Table 5).

Table 5 Programme of production unit shut downs for 01 July 2016 to 30 June 2017

Trip Date	Restart Date	Production unit
20-Sep-16	23-Sep-16	Motunui 01
10-Nov-16	21-Nov-16	Motunui 02
5-Dec-16	8-Dec-16	Motunui 02
17-Mar-17	24-Mar-17	Motunui 01
28-Apr-17	12-Jun-17	Motunui 01
29-Apr-17	7-May-17	Motunui 02
7-May-17	13-May-17	Motunui 02
31-May-17	9-Jun-17	Motunui 02
12-Jun-17	25-Jun-17	Motunui 01
27-Jun-17	6-Jul-17	Motunui 01

2.3.3 Surface water

2.3.3.1 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/hour. 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 flow did not fall below this level during the 2016-2017 monitoring period. Appendix II shows the hydrographs for the Waitara River at Bertrand Road for the monitoring period.

Water use reduction report

The Council received a report from Methanex in May 2016 relating to water use reduction at the Motunui site during the 2014 and 2015 calendar years. This report is a requirement of condition 4b of Consent 0820-2 (Motunui). This report is discussed in the previous monitoring report (Technical Report 2016-50) and the next water use reduction report is due in 2018.

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.

Methanex are yet to meet the requirements of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. Previously, Council officers attended a verification of the accuracy of the Motunui raw water flow meter (Plant 61) which confirmed that this meter was reading accurately. However, there is a distance of 8.7 km between the point of take and the Motunui site itself and the regulations require that the flow meter is positioned at the point of take. Although a flow meter is present at the point of take, it was not possible to undertake a verification with the present arrangement of pipework.

Further discussion on the background of these issues is provided in the previous monitoring programme annual report (Technical Report 2016-50).

At meeting on 19 July 2016 Methanex staff presented a proposed project to install a flow meter at the Waitara Valley site. There have been two changes in engineering staff since the initial on site meeting in the previous monitoring period and the progress on this work had been slow.

To ensure that the matter was satisfactorily resolved while allowing the consent holder a reasonable amount of time to investigate and complete the planning process for the installation and verification of water meters, an abatement notice (EAC-21395) was issued. The abatement notice was issued on 30 November 2016 and provided over 12 months for Methanex to meet their obligations under the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. The timeframe was considered reasonable to allow for the work to be planned and undertaken while also allowing for a reasonable amount of time to ensure that it could be achieved during a shutdown period.

At the time of writing this report, it was noted that Methanex had met the requirements of the abatement notice by September 2017.

Motunui water take pipeline leak

Methanex personnel reported an incident on the water pipeline from the Motunui water intake to the plant that took place on 30 August 2016. A farmer was at the site of the incident when it occurred and reported the leak to Methanex (Photo 2). Methanex responded immediately the leak was stopped. Methanex investigated the incident and determined that the leak was from the same air bleed valve as a previous incident in June (that incident was not considered a breach of their consent or plan rules). Methanex reported that the valve had not yet been replaced following the June incident. They estimated that the duration of the leak was 25 minutes (the farmer was at the location when the leak occurred and phoned immediately). The estimated quantity of water released was 20 m³ and the area of land flooded was approximately 100 m².

Although the initial June event was larger in scale, it had not been considered a breach of plan rules or consent conditions. However, it was reasoned that this second event should have been foreseeable and avoidable and therefore it was considered to be a breach of condition 4 of consent 0820-2.

This condition requires:

“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...”

It was reasoned that the delay in maintenance had resulted in a non-compliance despite the likely environmental effects of the discharge and loss of water being considered very low.



Photo 2 Motunui water take pipeline leak

2.3.3.2 Effluent monitoring

During July 2016 to June 2017 the Motunui site was operating continuously, although refurbishment works meant that at times 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 (m³/h), daily maximum (l/s) and daily volume (m³/day) for flow, and minima, maxima and daily averages for pH. A summary of the outfall effluent data is presented in Table 6.

Table 6 Summary of the Motunui's monitoring results of plant effluent during 2016-2017

Consent 3400-2	Unit	Minimum	Maximum	Consent limit	Number of breaches
Continuous measurement					
Flow (daily average)	m ³ /day	n/a	7,583	12,096	0
pH	-	6.05	9.05	6-9	0
Daily measurement					
Chemical oxygen demand	g/m ³	<25	87	200	0
Methanol	g/m ³	<2	<2	15	0
Suspended solids	kg/day	<3	163	500	0
Petroleum hydrocarbons	g/m ³	<1	<1	10	0
Monthly measurements					
Copper	g/m ³	<0.05	<0.05	0.50	0
Nickel	g/m ³	<0.10	<0.10	1.00	0
Zinc	g/m ³	<0.10	<0.10	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 6 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 7.

Table 7 Summary of Motunui chemical discharge data (calculated) for July 2016 to June 2017

Consent 3400-2 (special condition 8)					
Chemical	Unit	Minimum	Maximum	Average	Consent Limit
Gengard GN8020	kg/day	45	84	68	300
Spectrus BD1500	kg/day	0	0	0	0
Spectrus BD1501E	kg/day	5	69	12	70
Spectrus CT1300	kg/day	0	0	0	20 (40 for control of Legionella)
Spectrus NX1100	kg/day	0	18	9	50
Inhibitor AZ8104	kg/day	51	90	70	300
Steamate NA0880	kg/day	17	26	22	40
Cortrol OS 7780	kg/day	0	0	0	400
Cortrol OS 5601	kg/day	2	47	21	200
Optisperse HTP 7330	kg/day	15	60	31	120
Optisperse HTP 73611	kg/day	15	86	31	120
Foamtrol AF2290	kg/day	0	0	0	40
Betz Dearborn AE1115	kg/day	11	27	21	60
Klairaid PC 1190P	kg/day	33	98	73	600
Flogard MS6209	kg/day	0	0	0	40
Flogard POT6101	kg/day	20	56	42	60

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

Marine outfall report

A five-yearly 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 have been contracted by NPDC (who retain responsibility for maintenance of this structure) 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 in 2019.

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 and September 2014. This contingency plan was reviewed by Council officers and found to be satisfactory. Methanex reviewed their contingency plans and advised the Council that no changes were required in November 2016.

2.3.3.3 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 northern 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 4 and 5. 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 2016 to June 2017 are summarised in Table 8 below.

Table 8 Summary of Motunui stormwater monitoring data for 2016-2017

Consent 0822-2					
Parameter	Unit	Minimum	Maximum	Average*	Consent limit/ Guideline
Duck Pond (photo 3)					
pH	-	6.30	7.10	6.57	6 - 9.5
Petroleum hydrocarbons	g/m ³	N/A	<1	N/A	<5
Conductivity at 25°C	µs/cm	27.0	312.0	165.7	<300 *
Total suspended solids	g/m ³	<6	41.0	8.4	<100
Visual hydrocarbons	# Pass / # Fail	Tests passed: All	Tests failed: 0	----	PASS
Waihi Stream (photo 4)					
pH	-	6.6	7.3	7.0	6 - 9.5
Petroleum hydrocarbons	g/m ³	N/A	<1	N/A	<5
Conductivity at 25°C	µs/cm	40.0	128.0	101.6	<300 *
Total suspended solids	g/m ³	<6.00	13.00	N/A	<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

The stormwater samples analysed from the Waihi Stream monitoring site were within agreed limits required by the consent.

2.3.3.4 Inter-laboratory comparisons

On two occasions during the monitoring period, the Council carried out inter-laboratory comparisons. This exercise was carried out on the composite outfall sample (08 November 2016) and the Motunui site's stormwater (08 November 2016 and 16 June 2017). The results of the inter-laboratory comparisons, which also serve the purpose of compliance monitoring checks, are shown in Table 9 and Table 10. 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 9 Inter-laboratory comparison of Motunui outfall composite sample results

Parameter	Unit	Consent limits	08 November 2016	
			Methanex	TRC
Ammonia as N	mg/l		5.1	5.12
Chemical oxygen demand	mg/l	200	<25	42
Conductivity @ 25 °C	µs/cm		4440	4301
Copper	mg/l	0.5	<0.05	0.02
Methanol	mg/l	15	<2	<1
Nickel	mg/l	1.0	<0.10	0.03
pH		6.0-9.0	8.2	8.2
Total hydrocarbons	mg/l	10	<1	<0.5
Total suspended solids	mg/l	daily discharge <500kg	7	16
Zinc	mg/l	1.0	<0.1	0.029
Turbidity	NTU		2.7	2.2

Table 10 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
08 November 2016						
Ammonia as N	mg/l		<0.1	0.022	<0.1	0.080
Conductivity @ 25°C	µs/cm	300*	101	96.8	116	112
pH		6.0-9.5	7.1	7.0	6.5	6.4
Total hydrocarbons	mg/l	5	<1	<0.5	<1	<0.5
Total suspended solids	mg/l	100	7	6	<6	<2

Motunui site stormwater (Consent 0822-2)						
Parameter	Unit	Consent limits	Duck Pond (STW002012)		Waihi Stream (STW002013)	
			Methanex	TRC	Methanex	TRC
Zinc	mg/l		<0.1	0.009	0.13	0.148
Turbidity	NTU		6.4	5.7	1.6	1.0
Zinc filtered	mg/l			0.006	0.12	0.140
16 June 2017						
Conductivity @ 25°C	µs/cm	300*	92	86	232	224
pH		6.0-9.5	7.1	7.0	6.5	6.7
Total hydrocarbons	mg/l	5	<1	<0.5	<1	<0.5
Total suspended solids	mg/l	100	10	10	<6	<2
Zinc	mg/l		<0.10	0.025	<0.10	0.073
Turbidity	NTU		15	14	0.68	0.60
Zinc filtered	mg/l			0.015	<0.10	0.070

* Not a consent limit, but a guideline limit

Results from each laboratory for stormwater discharges met the consented water quality criteria on all occasions.

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

2.3.3.5 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 2016 to June 2017 were received by Council via monthly reports, and fulfil this consent requirement.

2.3.4 Air

2.3.4.1 Inspections

During the monitoring period the Council did not receive any formal complaints regarding odour or other discharges to air as a result of the Motunui site and their activities.

There was one information request received which suggested that the Methanex Motunui site had had a burn off creating a considerable blaze and pollution. The matter was reported post the event and therefore could not be confirmed or inspected. Discussion with Methanex staff confirmed that the plant was flaring at the time and it was suspected that the cooling tower plume may have been mistaken for pollution.

2.3.4.2 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 in 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 2014 to December 2015 was received in May 2016. The report was included in the 2015-2016 Motunui and Waitara Valley Combined Annual Report.

The next biennial report is expected in 2018 and will be discussed in the 2017-2018 compliance monitoring report.

2.3.5 Soil

Methanex no longer holds any consent to discharge contaminants to land. Historically Methanex held a consent (ref. 4907-1) to dispose of approximately 2,000 tonnes of river silt/sludge annually. The majority of the disposal area was sold to Shell Todd Oil Services, and a partial transfer of the consent occurred in 2004. In November 2007 the Council received (and subsequently granted) an application for surrender of the consent.

Presently the sludge lagoons collect river silt that has been backwashed from the clarifiers. In time this silt will be spread to land belonging to Methanex as permitted by Rule 29 of the RFWP.

2.3.6 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 courses 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 2016-2017 there were two non-compliant events recorded by Council that were associated with Methanex's Motunui site.

Breach of Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 (Incident IN/33964)

As discussed in section 2.3.3.1 of this report, an incident was raised in regard to Methanex's compliance with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. Methanex have met the requirements of the notice post the 2016-17 monitoring year and the details of this will be reported in the next annual compliance monitoring report.

Discharge of cooling tower water to stormwater (Incident IN/34147)

A second incident was raised in relation to a self-notification received from Methanex personnel. This incident concerned a discharge of cooling tower water to stormwater. An overflow of cooling water occurred from a sump located near the cooling towers, onto land and into a stormwater drain which flowed into the duck pond (Manu Stream) on the western side of the Methanex Motunui site. It was a small sump which under normal circumstance pumped its contents to the stormpond, however the pump had failed allowing it to overflow. The overflow occurred from late Monday night (28 November 2016) until early Tuesday morning (approximately 3am) when an operator noticed it and contained it. The cooling water in the sump was combined with demineralised water so it was expected that any contaminants were diluted. Methanex used vacuum trucks to continuously empty the sump to ensure it did not overflow again while the pump was being repaired, and sampled the duckpond to test for a range of potential contaminants.

The incident was responded to by way of site inspection. There were no films or other visual indicators of contamination. Methanex personnel advised that samples had been collected of the discharge and receiving waters and were being analysed presently in their laboratory for multiple parameters. A diesel pump was on standby in case the existing pump could not be repaired as a contingency measure. The inspecting officer was advised that due to the pump not working, the cooling tower wastewater (which had been diluted and increased in volume by rainfall and cooling tower condensate) had backed up and forced the sump lid up.

Sample analysis returned results that indicated that the event had not had a significant effect on the receiving water.

2.4 Discussion

2.4.1 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 activities allowed by the consents it holds for the site 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 confirmed complaints were received regarding flaring or the cooling tower plumes.

2.4.2 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 range of 500 – 1,200 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 regulations and their consent conditions in regard to water take pipeline integrity and flow meter positioning and verification issues. However it is noted that Methanex have been unhurried in their progress to resolving this issue. During the current monitoring year an abatement notice was issued with a reasonable timeframe to meet the consent and regulation requirements while providing Methanex with some time to plan and schedule the necessary work and alterations. The abatement notice required that the work should be complete by December 2017. It is not likely that the pipeline is significantly leaky, nor that the existing flowmeters are unreliable, as such it is expected that any environmental effects associated with this issue would be minimal and the non-compliance is largely administrative.

2.4.3 Environmental effects of exercise of water discharge permits

Methanex staff continued to provide the Council with monthly monitoring data. The parameters measured were all within 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.

2.4.4 Environmental effects of exercise of air discharge permits

The controls in place to minimise and mitigate the safety risks to operators onsite of air pollution also ensure 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.

2.4.6 Evaluation of performance

A tabular summary of Methanex's compliance record under its current active consents for the year under review is set out in Table 11 to Table 16.

Table 11 Summary of performance for Consent 0820-2

Purpose: <i>To take water from Waitara River</i>		
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	Yes
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 Minor pipeline leak – maintenance not undertaken immediately	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 Overall assessment of administrative performance in respect of this consent		High Improvement Required

Methanex have been unable to satisfy condition 4 of Consent 0820-2 with regards to the testing of pipeline integrity. Although they have been in discussion with Council about how they will meet the requirements of their consent, their progress on this matter has been limited. A separate requirement relating to the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010* may affect how Methanex achieves compliance with this consent condition. In addition to this, a repair on their watertake pipeline had not been prioritised following an earlier incident at the same location. Although the environmental consequences of this were negligible, Methanex did not meet the requirements of this consent and therefore their administrative performance is determined to require improvement.

Table 12 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. There was one minor incident reported relating the failure of a pump and the resulting contamination of stormwater with wastewater.	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 advised no changes required in 2016	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, SS and total recoverable hydrocarbons	Sample analysis results received. All results were within consent limits	Yes
6. Manu Stream: Discharge cannot cause specified adverse effects beyond mixing zone	Inspection – observation. Receiving water sample analysis	Yes
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 13 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

Table 14 Summary of performance for Consent 0827-3

Purpose: To discharge of wastewater 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
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 15 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	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
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 exercised during this monitoring period	Yes
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	N/A
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

Purpose: To discharge effluent and stormwater into Tasman Sea		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
16. Consent holder to maintain contingency plan	Contingency plans provided September 2014 and reviewed as satisfactory. Methanex advised that plans were reviewed in 2016 with no changes required	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

Table 16 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 May 2016. Next report expected in 2018	Yes

Purpose: <i>To discharge emissions into the air – methanol distillation and ancillary facilities</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
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 May 2016	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

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 performance and compliance with the resource consents for the Motunui installation as defined in Section 1.1.4. Their administrative performance has been rated as Good as although the performance against most consent conditions with respect to the administrative compliance was high, issues around testing the integrity of the water take pipeline and meeting the requirements of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010* are yet to be achieved. Methanex have been open and participative in their communication with regard to their progress on these issues.

2.5 Recommendations from the 2015-2016 Annual Report

In the 2015-2016 Annual Report it was recommended:

1. THAT in the first instance, monitoring of consented activities at the Methanex Motunui site in the 2016-2017 year continues at the same level as in 2015-2016.
2. THAT Methanex prioritises and advances work towards achieving compliance with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*.
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.

Recommendation 1 was fully implemented in the monitoring period.

Communication between Methanex and the Council has been on-going in relation to the location and verification of the water meters.

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.

2.6 Alterations to monitoring programmes for 2017-2018

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.

The compliance monitoring programme for 2016-2017 was essentially unchanged from that for 2015-2016, on the grounds that the Methanex Motunui site had achieved a good level of environmental performance and the existing monitoring programme was adequate to provide sufficient data to assess environmental performance. It is now proposed that for 2017-2018, the programme be maintained at the same level as the programme for 2016-2017.

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 2017-2018.

A recommendation to this effect is attached to this report.

2.7 Recommendations

1. THAT in the first instance, monitoring of consented activities at the Methanex Motunui site in the 2017-2018 year continues at the same level as in 2016-2017.
2. THAT should there be issues with environmental or administrative performance in 2017-2018, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT Methanex prioritises and advances work towards achieving compliance with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*.
4. 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.

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 900,000 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 3 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. nitrogen, 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 Resource consents

Methanex holds five active resource consents (excluding renewals) for the operation of the Waitara Valley site. A summary of the requirements imposed by each of the consents is provided in Sections 3.2.1 to 3.2.4 and copies of the resource consents are included in Appendix II.

A summary list of the consents held by Methanex in relation to Waitara Valley is given in Table 17.

The early consents were granted to Petralgas Chemicals NZ Limited. In May 1993, the Company was changed to Methanex Waitara Valley Limited, following the merger of Fletcher Challenge Methanol and Methanex Corporation Canada. The consents were transferred into the name of Methanex Motunui Limited in 2005.

Table 17 Consents held in relation to the Waitara Valley site, July 2016 – June 2017

Consent	Purpose	Volume (m ³ /day)	Review date	Expiry date
0801-2	Water take from Waitara River for the Waitara Valley petrochemical plant	7,200	Jun 2015	Jun 2021
0802-2	Discharge stormwater from the Waitara Valley site to the Waitara River	-	Jun 2015	Jun 2021
3399-2	Discharge treated wastewater and stormwater to Tasman Sea	5,000	Jun 2015	Jun 2021
3960-2	Construct rock groyne in Waitara River	-	Jun 2015	Jun 2021
4045-3	Discharge to air from methanol plant	-	Jun 2015	Jun 2021

Summaries of consent conditions

In the sections that follow, summaries of Methanex's Waitara Valley consent conditions are provided. It should be noted that these summaries may not reflect the full requirements of each condition. The consent conditions in full may be found in the resource consents which are appended to this report.

3.2.1 Water abstraction permits

Methanex holds one resource consent to abstract water for the Waitara Valley site as described below:

Consent 0801-2: Abstraction from the Waitara River

Methanex holds water consent 0801-2 to cover the abstraction at two points upstream of the methanol plant. The original permit was issued by the Council on 23 July 1980 under Section 87(d) of the RMA. It was due to expire in May 2008 and renewed as consent 0801-2 on 29 April 2008. This consent will expire in June 2021.

There are eight special conditions attached to this consent.

Special conditions 1 and 3 set out a maximum rate of abstraction of 300 m³/hr (approximately 83 l/s) when the flow rate of the Waitara River measured at Bertrand Road is greater than 4,600 l/s. No water is to be taken when the river falls below this level.

Special condition 2 requires that the consent holder must maximise the water take from the Motunui intake structure and minimise that taken from the old Waitara Valley intake.

Special condition 4 requires the installation and maintenance of a water meter and specifies the technical requirement around this. This condition specifies the format and frequency at which the water abstraction records are to be forwarded to the Council.

Special condition 5 requires the consent holder to avoid, remedy and mitigate and adverse effects as a consequence of exercising the consent. This includes five yearly testing and reporting of the pipeline integrity between the production site and take as well as the provision of a two yearly report on water use reduction programmes.

Special condition 6 requires screening of the intake structure to prevent the entrainment of fish.

Special condition 7 and 8 are lapse and review provisions.

3.2.2 Land use permit

3960-2: Rock groyne in Waitara River

Methanex holds land use permit 3960-2 which provides for the construction of a rock groyne in the Waitara River to control against river bed degradation in the vicinity of the water intake structure. This permit was issued by the Council on 23 September 1991 under Section 87(a) of the RMA. It was due to expire on 1 June 2003. The consent was renewed on 14 May 2003 and is due to expire on 1 June 2021. There are three special conditions attached to the consent.

Special condition 1 requires that the consent holder notify the Council prior to undertaking maintenance that may impact on the bed of the river.

Special condition 2 requires that when the structures are no longer required, they be removed and the area reinstated, and that the Council must be notified prior to their removal.

Special condition 3 provides for a review of the consent to be undertaken in June 2015. The consent is due to expire on 1 June 2021.

3.2.3 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.

Methanex currently holds two consents to discharge water from the Waitara Valley site, as described below.

Consent 0802-2: Discharge of uncontaminated stormwater to the Waitara River

The original discharge permit (consent 0802-1) was granted by the Council on 25 May 1981 under Section 87(e) of the RMA. That consent expired in June 2008. The renewed consent (consent 0802-2) presently provides for the discharge of stormwater to the Waitara River from the Waitara Valley site and is due to expire in June 2021.

There are seven special conditions attached to this consent:

Special condition 1 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 2 requires that the consent be exercised in accordance with the documentation supplied in support of the application.

Special condition 3 requires that the consent holder test the levels of contaminants in the stormwater prior to discharge and report these to Council.

Special condition 4 limits the concentration of certain analytes in the discharge and specifies the pH range.

Special condition 5 require certain water quality parameters to be met downstream of the discharge point and mixing zone.

Special conditions 6 and 7 relate to the lapse and review provisions of the consent.

Consent 3399-2: Discharge of effluent to Tasman Sea

Methanex holds coastal discharge consent 3399-2 to cover the discharge of treated wastes, including process and water treatment wastes and domestic sewage, and contaminated stormwater from the Waitara Valley site into the Tasman Sea. The discharge occurs via the Waitara marine outfall which discharges approximately 1,250 metres offshore from the Waitara River mouth. This consent was granted by the Council on 11 October 1989 under Section 87(e) of the RMA with an expiry date in May 2008. The renewed

consent (consent 3399-2) presently provided for the discharge of up to 5,000 m³/day, with a maximum discharge rate of 60 l/s.

There are 20 special conditions attached to this consent:

Special condition 1 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 2 requires the consent holder to keep records of the volume of effluent and provide these to the Council on a monthly basis.

Special condition 3 limits the volume and rate of the discharge.

Special condition 4 requires a minimum initial dilution factor to be met.

Special condition 5 limits the concentration of suspended solids.

Special condition 6 and 7 require certain water quality parameters to be met.

Special condition 8 limits what water treatment chemicals may be used and their relative dosing limits.

Special conditions 9 to 11 and 13 discuss the requirements of Methanex to advise the Council of any proposed changes in water treatment or cleaning chemicals, or equivalent chemicals, in order that limitations may be placed on their discharge, if necessary, for protection of the receiving waters.

Special condition 12 specifies the sampling point for condition 5, 6, 7 and 8.

Special condition 14 outlines what effects the discharge may not give rise to after a mixing zone of 200 metres.

Special condition 15 requires a contingency plan, to be maintained and put into operation in the event of spillage, accidental discharge, or pipeline failure. The plan is to be provided to Council initially after the granting of the consent and reviewed by the consent holder thereafter on a two yearly basis.

Special condition 16 specifies that the discharge of domestic sewage (human effluent) will not be permitted following the closure of the Waitara municipal WWTP.

Special conditions 17 and 18 require reports to be received from Methanex. Methanex must certify the structural integrity and dilution performance of the outfall at least every five years. An annual report on the performance of the effluent disposal system is also required and must detail compliance with conditions of the consent.

Special conditions 19 and 20 relate to the lapse and review provisions of the consent.

Since 2011, Methanex implemented an onsite sewage treatment system, which discharges as treated water to grass on site.

3.2.4 Air discharge permit

Methanex holds one air discharge consent for the Waitara Valley site.

Consent 4045-3: Discharges to air from the Waitara Valley methanol plant

Methanex holds air discharge consent 4045-3, to cover the discharge of emissions from combustion and other activities associated with the production of methanol at Waitara Valley.

The Council issued this permit on 6 December 1995 as a resource consent under Section 87(e) of the RMA. A minor variation to remove requirements relating to carbon dioxide emissions was granted on 6 April 2005. The consent was due to expire on 1 June 2008 but has been renewed as consent 4045-3, granted in April 2008 and is now due to expire in June 2021.

There are 14 special conditions attached to this consent.

Special condition 1 requires that the consent holder adopt the best practicable option to prevent or minimise adverse effects on the environment.

Special condition 2 requires the consent holder to operate all plant and processes to keep emissions to a practical minimum.

Special condition 3 specifies that the consent holder must notify the Council prior to any plant or process change which is likely to substantially change the amount or nature of emissions.

Special condition 4 requires the consent holder to supply a report to the Council, every three years. It must include a review of emission control technology, an emissions inventory, energy efficiency measures and any other relevant issues.

Special conditions 5 through 8 set limits on various gaseous contaminants (methanol, carbon monoxide, and nitrogen oxides) to protect the receiving environment and human health.

Special condition 9 restricts offensive or objectionable odour at or beyond the property boundary.

Special condition 10 specifies that the discharges authorised by the consent should not cause significant adverse effects on local ecosystems.

Special condition 11 is a review condition, including provisions for review of best practicable options in emission control technology.

Special condition 12 requires effects monitoring.

Special condition 13 is a lapse condition.

Special condition 14 allows for provisional review.

3.3 Results

3.3.1 Site inspections

Council officers carried out three compliance monitoring site inspections on 15 September, 07 December 2016 and 15 June 2017 as well as one compliance monitoring sampling visit for the purpose of collecting a split sample on 08 November 2016.

15 September 2016

An inspection of both the Motunui and Waitara Valley facilities 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 managed well and tidy with no off-site emissions or discharges detected. During the site visit, the tanker load out area was in use. There were no signs of leaks or odours nor any runoff to drains associated with this activity.

The inspecting officer was advised that the onsite sewage unit was to be replaced with a greater capacity unit in the next 12 months. No issues were detected by the officer with regard to the current unit.

Methanex personnel advised that the distillation and synthesis unit was undergoing maintenance and repairs due to a recent leak. The plant was shut down as a result and was expected to restart by the end of the week.

The intake facilities were also inspected and were found to be in a good and tidy condition. During the site visit Methanex staff communicated that replacement of the Waitara Valley water take meter was presently scheduled for the 2018 plant shutdown period.

07 December 2016

An inspection of both the Motunui and Waitara Valley sites 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.

Overall the site was well managed and tidy, with no off-site emissions or discharges detected. There was a minor diesel spill from small trailer tank onto gravel of storage pad that morning (covered approx. 1m² area). No discharge to groundwater or stormwater systems were considered likely. The spill was contained onsite, and Methanex advised that the contaminated gravel would be dug up and disposed of at RNZ Uruti alongside existing soil from desludging project.

15 June 2017

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

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

3.3.2 Production shutdowns

The following schedule of production unit shutdowns was received from Methanex Waitara Valley (Table 18).

Table 18 Programme of production unit shut downs for 01 July 2016 to 30 June 2017

Trip date	Restart date	Production unit
13-Sep-16	18-Sep-16	Waitara Valley
30-Jun-17	1-Jul-17	Waitara Valley

3.3.3 Surface water

3.3.3.1 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 (Figure 5) when the river flow at the Bertrand Road gauging station is above 4,600 l/s (16,560 m³/hour). A hydrograph of river flows at the Bertrand Road gauging station based on data for calculated mean daily flows during the 2016–2017 monitoring period is attached to this report as Appendix II. The Waitara River flow did not fall below the consent limit of 4,600 l/s level during the 2016-2017 monitoring period. Reported maximum daily abstraction rates were within allowable limits at all times.



Figure 3 Waitara Valley water take

Water use reduction report

The Council received a report from Methanex in May 2016 relating to water use reduction at Waitara Valley during the 2014 and 2015 calendar years. This report is a requirement of condition 5b of Consent 0801-2. It was discussed and included in the previous monitoring report (Technical Report 2016-50).

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 still being explored by the Council and Methanex during the monitoring period. As discussed in section 2.3.3 of this report, an abatement notice was issued in relation to this matter. At the time of writing this report, Methanex had met the requirements of the abatement notice for both sites.

3.3.3.2 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 (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 this data is presented in Table 19 and Table 20.

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 19.

Table 19 Summary of the Waitara Valley site's monitoring results of effluent during 2016-2017

	Unit	Minimum	Maximum	Consent limit	Number of breaches
Continuous measurement					
Volume of discharge	m ³ /day	0	3,426	5,000	0
pH	-	6.11	8.88	6-11	0
Daily measurement					
Petroleum hydrocarbons	g/m ³	<1	<1	10	0
Methanol	g/m ³	<2	7	15	0
Suspended solids	kg/day	<4	194	500	0
Monthly measurements					
Ammonia	g/m ³	0.10	9	200	0
Copper	g/m ³	<0.05	0.47	0.5	0
Nickel	g/m ³	<0.10	<0.10	1.0	0
Zinc	g/m ³	<0.10	4.70	2.0	1

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.

The zinc measured in the Waitara Valley site effluent was above the consent limit of 2 g/m³ on one occasion during routine sampling. This event was related to an incident that was reported to the Council at the time by Methanex and is detailed below in section 3.4 of this report.

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 20.

Table 20 Summary of Waitara Valley chemical discharge data (calculated) for July 2016 to June 2017

Water treatment chemicals - consent 3399-2 (calculated)					
	Unit	Minimum	Maximum	Consent limit	Number of breaches
Klaraid PC1192	Kg/day	32	93	150	0
Spectrus BD1501E	Kg/day	1	4	25	0
Spectrus NX1100	Kg/day	0	9	9	0
Inhibitor AZ8104	Kg/day	4	17	30	0
Steamate NA0880	Kg/day	14	22	25	0
Cortrol OS7780	Kg/day	11	22	300	0
Cortrol OS5601	Kg/day	0	0	300	0
Optisperse HTP 73301	Kg/day	7	12	50	0
Optisperse HTP 73611	Kg/day	6	16	50 (35 from April 2017)	0
Optisperse PO5211A	Kg/day	0	0	15	0
Foamtrol AF2290	Kg/day	0	0	2	0
Gengard GN8020	Kg/day	9	22	70	0
Flogard POT6101	Kg/day	1	8	15	0
Solus AP25	Kg/day	0	0	10	0

Compliance with conditions on effluent composition was achieved throughout the monitoring period from July 2016 to June 2017.

Methanex had requested a change in chemical in the previous monitoring period, 2015-2016, but never implemented this. This was to change from Cortrol OS7780 to Cortrol OS5601. This request was reversed in the 2017-2018 monitoring period and will be discussed in the next annual report.

Equivalent chemical

On 14 March 2017 Methanex applied for approval to change one of the water treatment chemicals used at the Waitara Valley site to treat boiler feed water. The intention was to reduce the use of the existing chemical, Optisperse HTP73611, from 50 to 35 kg/day and complement it with 10 kg/day of a new product, Solus AP25. Methanex has indicated that the replacement chemical may be considered equivalent (as per the definition in the consent).

The change was accepted by the Council and no review of conditions on consent 3399-2 was required in respect of the discharge of the proposed replacement water treatment chemicals.

Permitted activity – onsite sewerage 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 higher capacity, with effluent which would also be treated to a higher level 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 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.

3.3.4 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 2016-2017 monitoring period.

3.3.5 Inter-laboratory comparisons

The Council carried out inter-laboratory comparisons on one occasion during the monitoring period under review. 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 21. The exercise also serves as a compliance monitoring check.

Table 21 Inter-laboratory comparison on Waitara Valley effluent composite sample results

Parameter	Unit	Consent limits	08 November 2016	
			Methanex	TRC
Ammonia as N	mg/l		1.2	1.13
Chemical oxygen demand	mg/l	200	<25	18
Conductivity @ 25 °C	µs/cm	300*	1110	1090
Copper	mg/l	0.5	<0.05	<0.01
Methanol	mg/l	15	<2	<1
Nickel	mg/l	1.0	<0.10	<0.02
pH		6.0-11.0	7.5	7.5
Total hydrocarbons	mg/l	10	<1	<0.5
Total suspended solids	mg/l	daily discharge <500 kg	<6	5
Zinc	mg/l	1.0	<0.10	0.015
Turbidity	NTU		4.5	2.6

* Guideline limit; not a consent limit

Results from each laboratory for stormwater 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 2016-2017 monitoring period.

3.3.5.1 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 monthly reports throughout the monitoring period and thus comply with this condition.

3.3.6 Air

3.3.6.1 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.

3.3.6.2 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 May 2016 covering the 2014 and 2015 calendar years. The findings of the report are summarised in the previous annual report (Technical Report 2016-50). The next report will be due in 2019.

3.4 Investigations, interventions, and incidents

In 2016-2017 there was one non-compliant event recorded by Council that was associated with Methanex's Waitara Valley site.

Breach of consent condition (Incident IN/34598)

Self-notification was received concerning a contravention of zinc and copper limits in special condition 7 of Resource Consent 3399-2 at the Methanex Waitara Valley site on 30 April 2017.

The incident investigation summary is attached in Appendix III. The incident arose due to a loss of control of pH in the cooling water system, which dropped to pH2. The acidic water attacked the brass components of the infrastructure, dissolving copper and zinc into the cooling water system. These dissolved metals were then entrained in the cooling water blowdown which went to the checkpond, and on to the outfall. The pH drop happened for a few hours on Sunday 30th April. Methanex personnel realised this potential for the

breach on Tuesday 2nd May. The analysis for metals in the wastewater is undertaken on a monthly basis, and therefore Methanex had not analysed on these days. However upon realising the potential incident, they checked the samples based on the theory that this may have happened and confirmed it did (Table 22). From the Wednesday they put in place a process to dilute this water with the stormpond water.

The results for metal analysis on the Waitara Valley composite wastewater samples following the incident are as follows:

Table 22 Analysis of Waitara Valley site effluent following low pH incident

DATE	Cu (mg/L)	Zn (mg/L)	Ni (mg/L)
Sunday 30 April 2017	<0.05	<0.1	<0.1
Monday 01 May 2017	0.47	4.7	<0.1
Tuesday 02 May 2017	0.81	8.8	<0.1
Wednesday 03 May 2017	0.10	0.92	
Thursday 04 May 2017	0.06	0.58	
Friday 05 May 2017	<0.05	0.38	
Saturday 08 May 2017	<0.05	0.46	
Sunday 09 May 2017	<0.05	0.31	
Monday 10 May 2017	0.06	0.43	

Results indicated that the levels returned to near normal levels within 10 days. The event was not immediately evident or anticipated. Methanex responded appropriately and no enforcement was considered appropriate or necessary.

3.5 Discussion

3.5.1 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. An incidents relating to treated wastewater contamination was self-reported by Methanex during the monitoring period. The likely environmental effects were considered minor. No enforcement action was considered appropriate or necessary in response to the event as it was considered relatively unforeseeable and appropriate responses were undertaken by Methanex.

3.5.2 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.

3.5.3 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.

3.5.4 Evaluation of performance

A tabular summary of Methanex's compliance record for the year under review is set out in Table 23 to Table 27.

Table 23 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	Yes
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 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
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 Overall assessment of administrative performance in respect of this consent		High Good

N/A = not applicable

Methanex have been unable to satisfy condition 4 of Consent 0801-2 with regards to the testing of pipeline integrity and have been in discussion with the Council as to how they may achieve this. The Council has begun to request a more urgent response. As a result their administrative performance rating has been set as good. A separate requirement relating to the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010* may affect how Methanex achieves compliance with this consent condition.

Table 24 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

Table 25 Summary of performance for Consent 3399-2

Purpose: To discharge treated wastes 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 wastes 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	One exceedance event related to a process issue resulting in high copper and zinc levels in the effluent	No
8. Allowable water treatment chemicals and volumes	Inspection and liaison with consent holder	Yes
9. Approval from the Council required to discharge 'equivalent' chemical	Approval was given to substitute one water treatment chemical	Yes
10. Definition of 'equivalent'	N/A	N/A
11. Discharge of equivalent chemical requires written request	Written request received	Yes
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 with the exception of one incident	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

Purpose: To discharge treated wastes into the Tasman Sea		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
20. Review of consent	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

The performance rating applied to this consent is considered high despite a breach of condition 7. The reason for this is that the breach was accidental and caused by the effect of low pH on metal components of the plant. Although post the event, the personnel at the plant predicted that there may be a breach resulting from the low pH levels, the significant entrainment of metals in the effluent was obviously deducible.

Table 26 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

Table 27 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

Purpose: To discharge contaminants into the air		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Triennial written air discharge report	Report received May 2016	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
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

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 performance and compliance with the resource consents for the Waitara Valley site as defined in Section 1.1.4. Their administrative performance has been rated as 'Good' as although the performance against most consent conditions with respect to the administrative compliance was high, issues around testing the integrity of the water take pipeline and meeting the requirements of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010* are yet to be achieved. Methanex have been open and participative in their communication with regard to their progress on these issues.

3.6 Recommendations from the 2015-2016 Annual Report

In the 2015-2016 Annual Report, it was recommended:

1. THAT in the first instance monitoring of consented activities at the Methanex Waitara Valley site in the 2016-2017 year continues at the same level as in 2015-2016.
2. THAT Methanex prioritises and advances work towards achieving compliance with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*.
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 was carried out in full.

Communication between Methanex and the Council has been on-going in relation to the location and verification of the water meters.

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.

3.7 Alterations to monitoring programmes for 2017-2018

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.

The compliance monitoring programme for 2016-2017 was essentially unchanged from that for 2015-2016, on the grounds that the Methanex Waitara Valley site has maintained a high level of environmental performance (where the incidents have been excluded) and the existing monitoring programme was adequate to provide sufficient data to assess environmental performance. It is now proposed that for 2017-2018, the programme be maintained at the same level as the programme for 2016-2017.

Recommendations to this effect are attached to this report.

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 2017-2018.

3.9 Recommendations

1. THAT in the first instance monitoring of consented activities at the Methanex Waitara Valley site in the 2017-2018 year continues at the same level as in 2016-2017.
2. THAT should there be issues with environmental or administrative performance in 2017-2018, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT Methanex prioritises and advances work towards achieving compliance with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*.
4. 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.

4 Summary of recommendations

1. THAT in the first instance monitoring of consented activities at the Methanex Motunui site in the 2017-2018 year continues at the same level as in 2016-2017.
2. THAT monitoring of consented activities at the Methanex Waitara Valley site in the 2017-2018 year continues at the same level as in 2016-2017.
3. THAT should there be issues with environmental or administrative performance in 2017-2018, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
4. THAT Methanex prioritises and advances work towards achieving compliance with the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*.
5. 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.

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 20°C and expressed in mS/m.
Council	The Taranaki Regional Council.
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m ³ /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.

mS/m	Millisiemens per metre.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH ₄	Ammonium, normally expressed in terms of the mass of nitrogen (N).
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	Waste water 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 the Council's laboratory.

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Appendix I

Resource consents held by Methanex

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

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
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

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

Consent 4042-3

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

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

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

Consent 3399-2

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 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:
- 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.

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

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

Consent 3960-2

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. 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: 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.

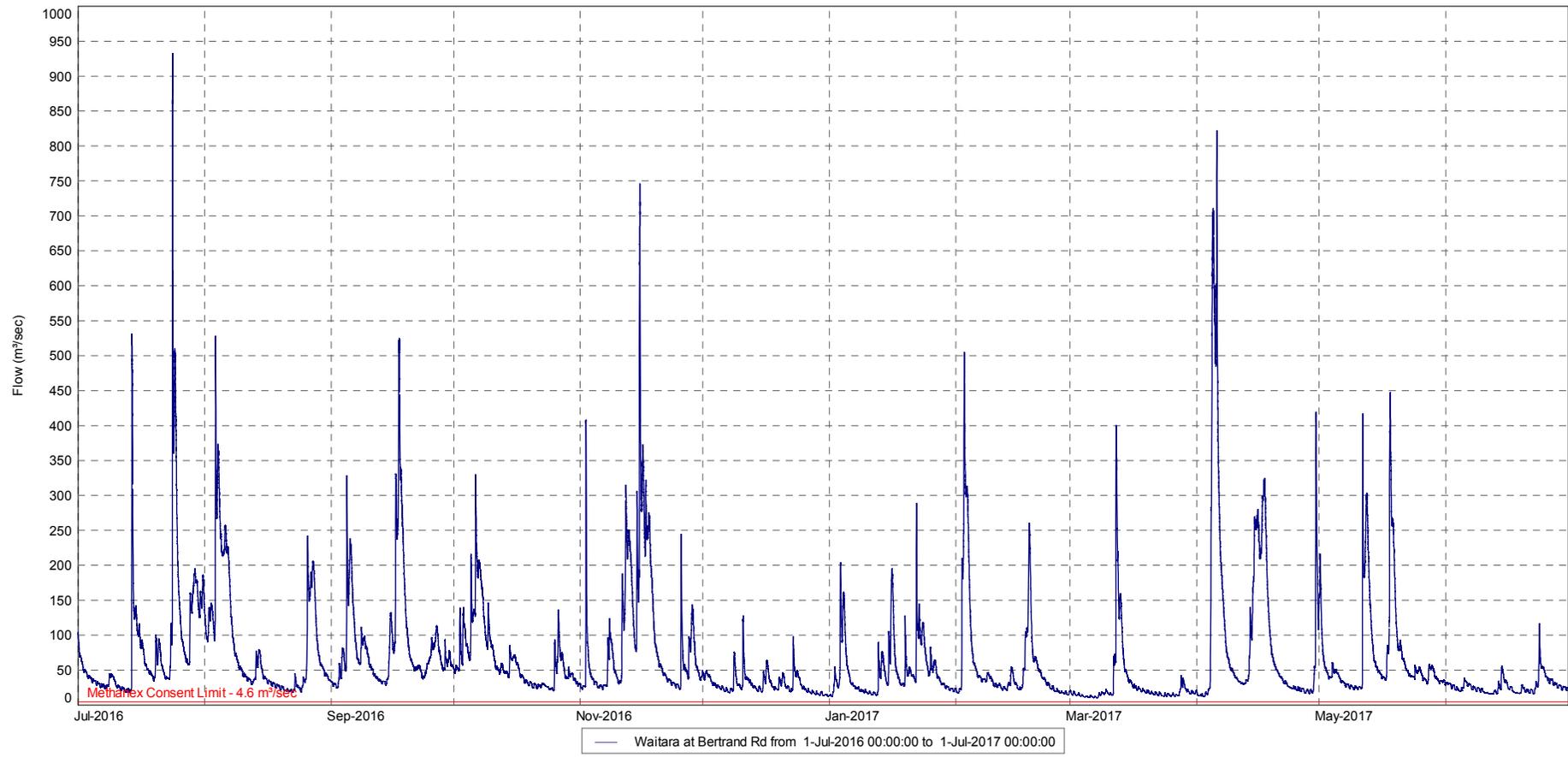
Signed at Stratford on 29 April 2008

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 2016 to June 2017



Appendix III
Methanex incident report – elevated zinc and
copper in treated effluent discharge



**MANUAL BYPASSES BEING USED
FREQUENTLY INCREASE RISK**

Preventing re-occurrence

Lessons

- ◇ Dosing of cooling tower should have a procedure/checklist in place
- ◇ Actions from incidents should cover all possible scenarios that could stem from the root cause
- ◇ Be mindful of potential risk as well as actual risk when assessing severity of incidents or classifying PCRs

Actions

- Immediately review the existing PCR and raise priority to action. Note the risk of this due to several incidents. Cover all possible scenarios for overdosing the cooling tower with acid.
- Develop a procedure for manual dosing of cooling tower with acid
- Investigate and report reasons for repeat failures of control valve AC-4202-1

What happened?

A Field Operator was instructed to dose the cooling tower with acid. The control valve which is normally used for dosing was not working. The Field Operator went and opened the valve. He then realized he had not started the acid pumps, resulting in no acid flow. He returned to the utilities control room and started the acid pump. The Field Operator was very busy during this shift and subsequently forgot to return the valve to its normal state (closed). Later the operator was required to switch the pump on to flow acid for a regen. He did not realize that by inadvertently leaving the bypass valve open acid also began to flow to the cooling tower.

The STL noticed the low pH on the cooling tower then went to check the valve and found it was open. As a result of the valve being left open, acid was overdosed. Low pH in the cooling tower, which causes leeching of copper and zinc into the cooling water, resulted in the blowdown being contaminated with copper and zinc and subsequently exported to the outfall. This resulted in two days of environmental exceedances.

Why did it happen?

Root causes

- Corrective Action Needs Improvement: Corrective actions from past incidents did not address the root causes of overdosing the cooling tower through the manual operation of the control valve or the use of manual bypass valve. There were 3 incidents that occurred before this that resulted in an overdose of acid.
- Repeat Failure: There have been repeated failures of this control valve AC-4202-1 which have led to the manual bypass having to be used for acid dosing.
- No Procedure: There was no procedure or checklist to perform manual dosing of the cooling tower.
- Errors not Detectable: The only indicator for the control room is the pH meter on the cooling tower. This is not a good indicator as it is a lagging indicator. It is also normal to see a sharp dip in the pH when manually dosing. By the time it is noticed there is too much acid there may already be damage to the cooling tower. This is one of a number of technological deficiencies in the system.

