Waitara Marine Outfall
Ecological Monitoring Programme Report 2011-2013

Technical Report 2013–52

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Executive summary

The New Plymouth District Council (NPDC) manages the Waitara Marine Outfall, which discharges approximately 1250 m offshore from the mouth of the Waitara River into the Tasman Sea. The outfall provides for the disposal of wastewater from the Waitara municipal sewage reticulation system, along with Methanex Waitara Valley and Methanex Motunui Limited methanol plants. The outfall was previously managed by the Waitara Outfall Management Board (WOMB), made up of NPDC, Methanex and Anzco Foods Waitara Limited. In 2010, NPDC took over sole management of the outfall, and has a contract with Methanex to allow the continued use of the outfall for their discharge. Anzco Foods Waitara Limited stopped being a member of WOMB in July 2009, and instead discharges into the sewer line to the wastewater treatment plant under a trade waste agreement with New Plymouth District Council (NPDC). This three year report for the period January 2011 to December 2013 describes the ecological monitoring programme and any effects of the Waitara outfall on local intertidal reef communities.

The Waitara Marine Outfall ecological programme has been operating in its present form for over twenty years. Five survey sites are included in the programme consisting of three potential impact sites and two control sites. These five sites were surveyed during spring 2011, 2012 and 2013.

NPDC and Methanex hold a total of four resource consents in relation to the Waitara Marine Outfall, which include a total of 64 conditions setting out the requirements that the holders must satisfy. Three consents allow for the discharge of effluent into the Tasman Sea. One consent deals with the structure which conveys the effluent. During the period under review, the NPDC consent to discharge municipal wastes was renewed.

Waitara Marine Outfall reports are based on a calendar year (as opposed to the usual July-June Council monitoring period), with additional annual reports covering shoreline bacteriological water quality (TRC 2013-85) and the waste water treatment plant (TRC 2013-86).

Over the three years, NPDC and Methanex demonstrated a good level of environmental performance and compliance with the resource consents. With respect to NPDC, there were seven incidents recorded by the Council that were associated with the Waitara Waste Water Treatment Plant and associated pump stations. For six of the incidents it was found that the Incident Response Plan had been adhered to and that no follow up enforcement action was necessary. One incident (18 October 2013) contravened the RMA and breached Consent 3397-2, resulting in an infringement notice being issued. This infringement notice has been taken into consideration when evaluating environmental performance in the waste water treatment plant report (TRC 2013-86). There was one incident recorded with respect to Methanex Motunui Limited, details of which are provided in the TRC technical report TRC 2013-72.

Marine ecology survey results showed no obvious impact of the Waitara Marine Outfall discharge on the local intertidal community over the last twenty years in terms of species diversity. Both control and potential impact sites showed interannual variability and there were no obvious declining trends in potential impact sites relative to control sites.

This report includes recommendations for the 2014 year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This Taranaki Regional Council report covers the period from January 2011 to December 2013 and describes the monitoring programme associated with resource consents held by New Plymouth District Council (NPDC), Methanex Motunui Limited, and Methanex Waitara Valley Limited (Methanex). The Waitara Marine Outfall was previously managed by Waitara Outfall Management Board (WOMB) to oversee the refurbishment and maintenance of the outfall, which was made up of NPDC, Methanex and Anzco Foods Waitara Limited. In 2010 NPDC took over sole management of the outfall, and has a contract with Methanex to allow the continued use of the outfall for their discharge. In July 2009, Anzco Foods Waitara Limited ceased being part of WOMB, and instead discharges to the sewer under a trade waste agreement with New Plymouth District Council (NPDC).

The Waitara Waste Water Treatment Plant (WWWTP) is operated by NPDC to provide for the township of Waitara, which has a population of approximately 6500 people. The plant is situated on the true left bank of the Waitara River approximately 1.1 km from its mouth.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by NPDC and Methanex that relate to discharges of water in the Tasman Sea catchment. This is the eighteenth report to be prepared by the Taranaki Regional Council to cover the Waitara Marine Outfall discharge and its effects.

1.2 Structure of this report

Section 1 sets out general information about compliance monitoring under the Resource Management Act and the Council's obligations and general approach to monitoring sites through annual programmes. The report also covers the resource consents held by NPDC and Methanex, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted in the outfall catchment.

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

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

Section 4 presents recommendations to be implemented in the 2014 monitoring year.

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

1.2.1 The Resource Management Act (1991) and monitoring

The Resource Management Act 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 a discharger, and may include cultural and socio-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 (eg, recreational, cultural, or aesthetic);
(e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Taranaki Regional Council is recognising the comprehensive meaning of `effects' inasmuch as is appropriate for each discharge source. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the Resource Management Act to assess the effects of the exercise of consents. In accordance with section 35 of the Resource Management Act 1991, the Council undertakes compliance monitoring for consents and rules in regional plans; and maintains an overview of performance of resource users against regional plans and consents. Compliance monitoring, including impact monitoring, also enables the Council to continuously assess its own performance in resource management as well as that of resource users particularly consent holders. It further enables the Council to continually re-evaluate its approach and that of consent holders to resource management, and, ultimately, through the refinement of methods, to move closer to achieving sustainable development of the region's resources.

1.2.2 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the consent holder(s) during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

- a **high** level of environmental performance and compliance indicates that essentially there were no adverse environmental effects to be concerned about, and no, or inconsequential (such as data supplied after a deadline) non-compliance with conditions.

- a **good** level of environmental performance and compliance indicates that adverse environmental effects of activities during the monitoring period were negligible or minor at most, or, 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, or, there were perhaps some items noted on inspection notices for attention but these items were not urgent nor critical, and follow-up inspections showed they have been dealt with, and any

inconsequential non compliances with conditions were resolved positively, co-operatively, and quickly.

- **improvement required (environmental)** or **improvement required (administrative compliance)** (as appropriate) indicates that the Council may have been obliged to record a verified unauthorised incident involving measurable environmental impacts, and/or, there were measurable environmental effects arising from activities and intervention by Council staff was required and there were matters that required urgent intervention, took some time to resolve, or remained unresolved at the end of the period under review, and/or, there were on-going issues around meeting resource consent conditions even in the absence of environmental effects. Abatement notices may have been issued.

- **poor performance (environmental)** or **poor performance (administrative compliance)** indicates generally that the Council was obliged to record a verified unauthorised incident involving significant environmental impacts, or there were material failings to comply with resource consent conditions that required significant intervention by the Council even in the absence of environmental effects. Typically there were grounds for either a prosecution or an infringement notice.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

1.3 Process description

The Waitara Marine Outfall discharges into the Waitara embayment approximately 1250 metres offshore from the mouth of the Waitara River in approximately 10 metres of water. This outfall currently provides for the disposal of wastewater from the Waitara municipal sewage reticulation system and the Methanex Waitara Valley and Motunui methanol plants. The Methanex Motunui Limited methanol plant was decommissioned on 1 April 2005, however the plant commenced production again in October 2008. Until September 1997 the outfall also conveyed wastewater from AFFCO's meat-works.

During 1991 WOMB undertook a refurbishment of the outfall to provide a 25 year life period and to improve the initial dilution. This process involved an impervious plastic liner inserted through the pipeline, improvement of the stability of the pipeline on the seabed and the installation of a new diffuser.

In 1991/1992, NPDC and AFFCO constructed a wastewater treatment plant for the combined domestic and meat-works effluent, which had previously been discharged through the outfall with minimal treatment. The current treatment comprises of screening wastewater to 0.5 mm particle diameter (wastewater is screened at the wastewater treatment plant), followed by disinfection through the elevation of pH with lime to pH 11 and holding for a minimum of four hours. Treated wastewater is discharged through the outfall in batches at a constant rate, the frequency depending on influent flow rates.

1.4 Resource consents

1.4.1 Water discharge permit

Section 15(1)(a) of the Resource Management Act 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.

The New Plymouth District Council hold consent **3397-2**, to discharge up to 11,950 m^3 day^{-1} from the Waitara Wastewater Treatment Plant into the Tasman Sea via the Waitara Marine Outfall. This consent commenced on 13 December 2011. There are 16 conditions attached to the consent relating to effluent volume, effluent quality, monitoring, reporting, contingency plans, signage, community liaison and review of conditions.

Methanex Waitara Valley hold consent **3399-2**, to discharge treated wastewater and stormwater from the Waitara Valley methanol plant into the Tasman Sea via the Waitara Marine Outfall. This consent was granted on 29 April 2008. There are 20 conditions attached to the consent relating to the outfall, effluent volume, dilution and composition, contingency plans and annual reports, and review of conditions.

Methanex Motunui Limited hold consent **3400-2**, to discharge treated wastewater and stormwater from the Motunui methanol plant into the Tasman Sea via the Waitara Marine Outfall. This consent was granted on 29 April 2008. There are 21 conditions attached to the consent relating to effluent volume, dilution and composition, contingency plans and annual reports, and review of conditions.

The consent was varied on 18 July 2012 following problems that year with maintaining levels of the bacterium *Legionella* at safe numbers. The variation included a new condition to allow the maximum daily limit of the water treatment chemical 'Spectrus CT1300' to be increased to 40kg/day if a spike in the numbers of the bacteria *Legionella* is detected.

Copies of these permits are attached to this report in Appendix I.

1.4.2 Coastal permit

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

NPDC and Methanex, as joint consent holders, renewed coastal permit **4599** to erect, place and maintain a structure [known as the "Waitara Marine Outfall"] and to occupy the associated coastal space in the coastal marine area. This permit was issued by the Taranaki Regional Council on 14 September 2007 under Section 87(c) of the Resource Management Act. It is due to expire on 1 June 2021.

There are three special conditions attached to the consent, these deal with maintenance of the structure and review of the consent.

A copy of the permit is attached in Appendix I.

1.5 Monitoring programme

1.5.1 Introduction

Section 35 of the Resource Management Act sets out an obligation for the Taranaki Regional Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region.

The Taranaki Regional 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 marine ecological monitoring programme consisted of two primary components.

1.5.2 Programme liaison and management

There is generally a significant investment of time and resources by the Taranaki Regional Council in on-going liaison with resource consent holders over consent conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, renewals, or new consents, advice on the Council's environmental management strategies and the content of regional plans, and consultation on associated matters.

1.5.3 Marine ecological survey

A marine ecological survey was conducted at five sites between 26 and 30 September in 2011, 17 and 21 September in 2012 and 17 and 23 September in 2013. The potential impact sites were Orapa B, approximately 1.5km south west of the outfall (SEA901043); Orapa A, approximately 1.1 km south west of the outfall (SEA901040); and Airedale Reef, approximately 1.1 km north east of the outfall (SEA901030). The two control sites were Turangi Reef, 7.25 km north east of the outfall (SEA 900095); and Greenwood Road (SEA 903070), approximately 32.5 km south west of the outfall. These monitoring sites are shown in Figures 1 and 2.

At each site a 50 m transect laid parallel to the shore was used to establish five 5 m x 3 m blocks. Within each block, five random 0.25 m^2 quadrats were laid giving a total of 25 random quadrats. For each quadrat the percentage cover of algal and encrusting animal species was estimated using a grid. For all other animal species, individuals larger than 3 mm were counted. Under boulder biota was counted where rocks and cobbles were easily overturned.

The Waitara Marine Ecological Monitoring Programme is one of two 'impact' monitoring programmes carried out in relation to discharges from Waitara Marine Outfall. The other programme monitors shoreline bacteriological water quality in the Waitara Embayment.

The major effluents contributing to the Waitara Marine Outfall discharge are each monitored at source in 'compliance' monitoring programmes. Annual reports are also produced on these programmes.

Photo 1 Potential impact site Orapa B (SEA901043)

Photo 2 Potential impact site Orapa A (SEA901040)

Photo 3 Potential impact site Airedale Reef (SEA901030)

Photo 4 Control site Turangi Reef (SEA900095)

Photo 5 Control site Greenwood Road Reef (SEA903070), showing high sand inundation (2013)

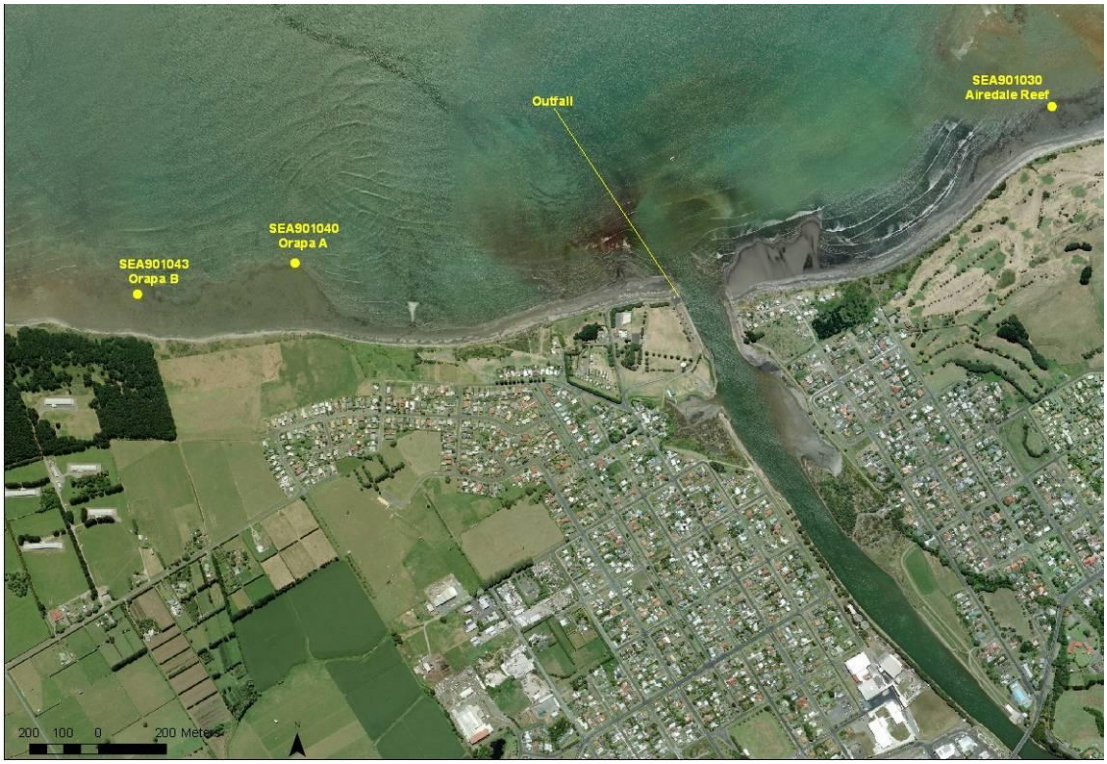


Figure 1 Location of potential impact sites relative to the Waitara Marine Outfall
Note: Survey sites are covered by water as aerial photographs were taken at high tide

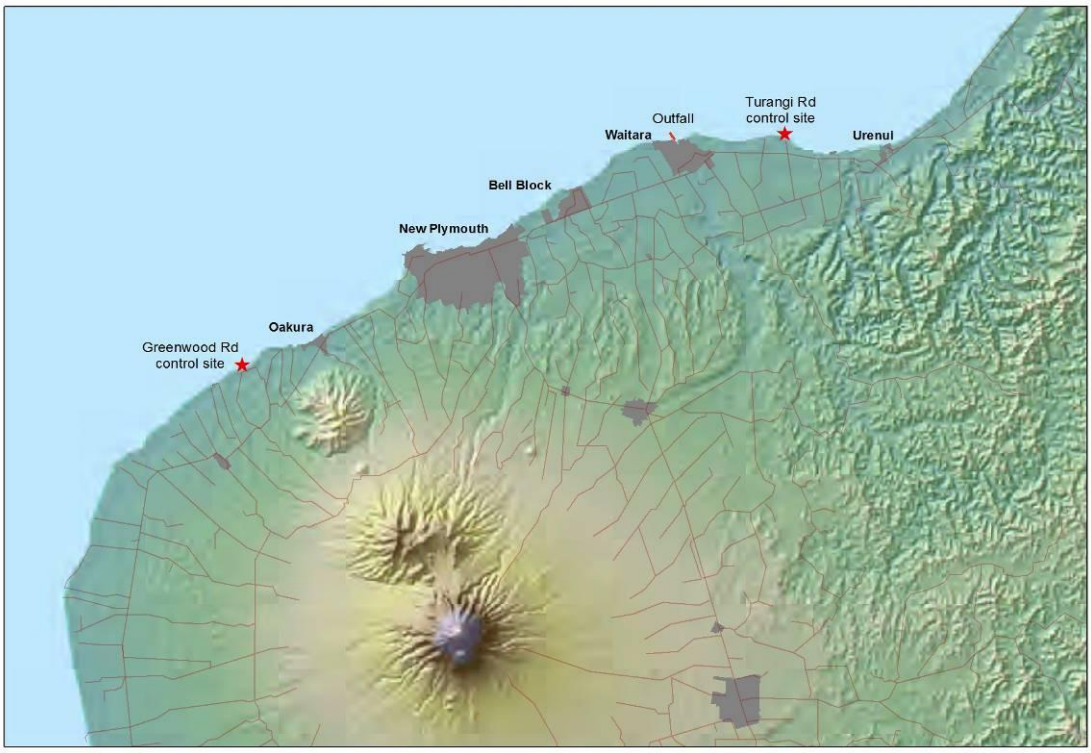


Figure 2 Location of the control sites relative to the Waitara Marine Outfall

2. Results

2.1 Marine ecological monitoring

Summary statistics for 2013 including the mean number of species per quadrat and the mean Shannon-Weiner diversity index per quadrat are shown in Table 1 (equivalent data for 2011 and 2012 are included in Appendix II and III). In September 2013, Turangi Reef (control) had the highest number of species, followed by Orapa A (potential impact) and Orapa B (potential impact). Airedale Reef (potential impact) and Greenwood Road (control) had the lowest number of species. Orapa A had the highest diversity, followed by Orapa B, Turangi Reef, Airedale Reef, and Greenwood Road respectively.

Table 1 Mean results for the September 2013 survey

Site	No. of Quadrats	Mean number of species per quadrat			Mean Shannon Weiner Index per quadrat		
		Algae	Animals	Total Species (Algae & Animals)	Algae	Animals	Total Species (Algae & Animals)
Greenwood Road	25	2.24	3.40	5.64	0.26	0.29	0.42
Orapa B	25	4.80	9.84	14.64	0.52	0.76	0.90
Orapa A	25	4.60	10.96	15.56	0.53	0.78	0.91
Airedale Reef	25	3.52	9.20	12.72	0.38	0.69	0.81
Turangi Reef	25	4.40	12.08	16.48	0.36	0.70	0.86

The Shannon-Weiner diversity index incorporates the abundance of individual species in addition to the number of species present, providing a measure of diversity.

2.2 Number of species per quadrat

Figure 3 shows the total number of species per quadrat at each site as a box and whisker plot. The notched area of the box represents the median plus and minus the 95% confidence interval. This form of graphical representation allows a quick comparison to be made between sites. Generally, if the notched areas of the boxes for the different sites do not overlap you would expect to obtain a significantly different result with ANOVA.

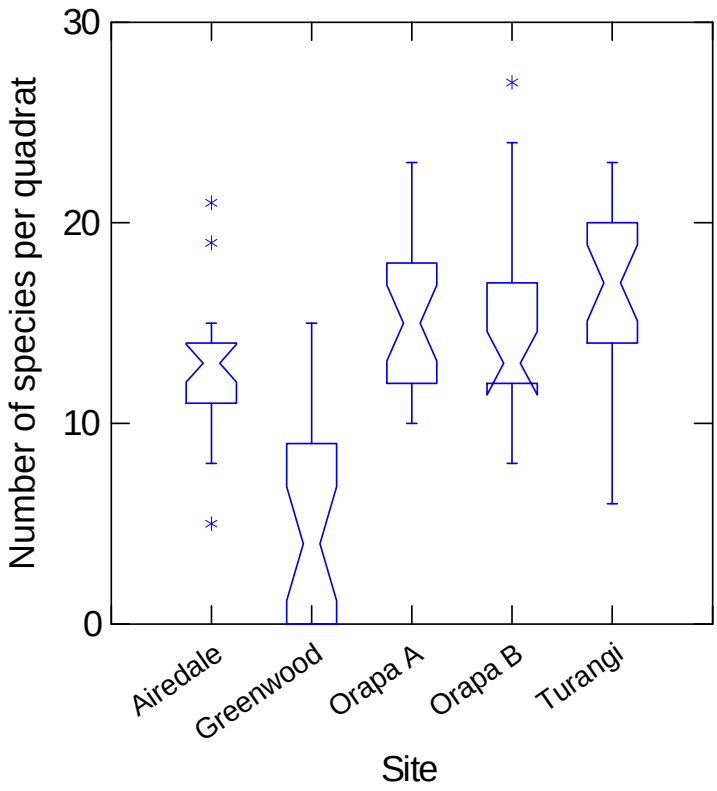


Figure 3 Box and whisker plot of total number of species per quadrat

There was a significant deviation from normal distribution at the following sites: Airedale, Orapa B and Greenwood Road (Lilliefors test, n = 25, P <0.05). There was a significant difference in species number per quadrat between sites (ANOVA, n = 25, F = 24.3, P <0.001).

Table 2 Tukey's multiple comparison test of total number of species per quadrat

Site	Greenwood Rd	Orapa B	Orapa A	Airedale Reef
Orapa B	SIG			
Orapa A	SIG	NS		
Airedale Reef	SIG	NS	NS	
Turangi Reef	SIG	NS	NS	SIG

Key - ***SIG = significant difference at 95% confidence level***
NS = no significant difference at 95% confidence level

Significant differences between sites were determined using Tukey's multiple comparison test (Table 2). At Greenwood Road the mean number of species per quadrat was significantly lower than that at all other sites (P <0.05). The mean number of species per quadrat at Turangi Reef was significantly higher than that at Airedale Reef (P <0.05).

2.3 Shannon-Weiner Diversity Index

Figure 4 shows the Shannon-Weiner index per quadrat at each site as a box and whisker plot.

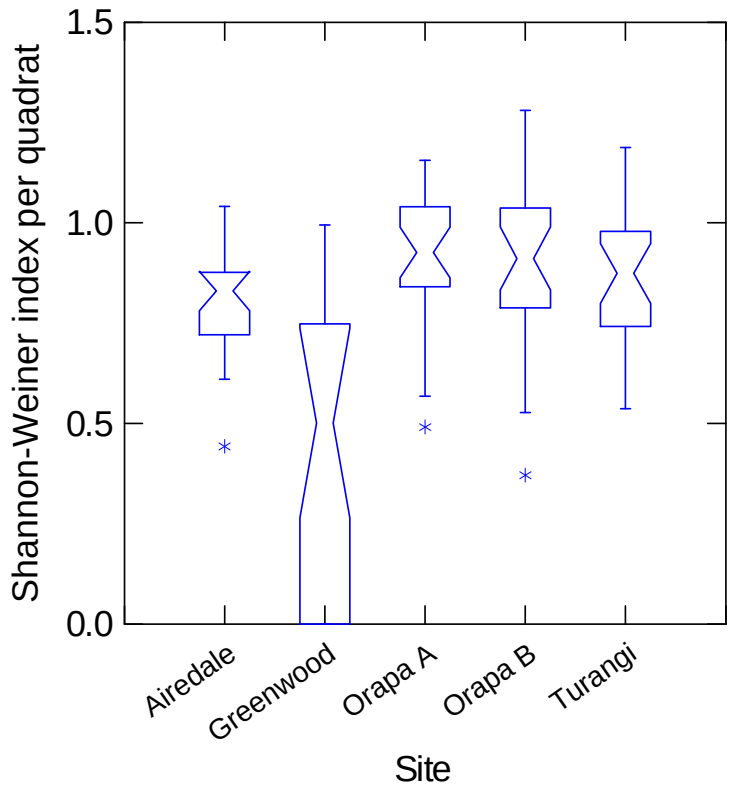


Figure 4 Box and whisker plots of mean Shannon-Weiner index per quadrat

At the 95% confidence level, there was a significant deviation from a normal distribution at Greenwood Road only (Lilliefors test, n = 25, P = 0.002). There was a significant difference in the Shannon-Weiner index per quadrat between sites (ANOVA, n = 25, F = 21.0, P <0.001). Significant differences between sites were determined using Tukey's multiple comparison test (Table 3). At Greenwood Road the mean Shannon-Weiner index per quadrat was significantly lower than that at all other sites (P <0.05).

Table 3 Tukey's multiple comparison test of Shannon Weiner Index per quadrat

Site	Greenwood Rd	Orapa B	Orapa A	Airedale Reef
Orapa B	SIG			
Orapa A	SIG	NS		
Airedale Reef	SIG	NS	NS	
Turangi Reef	SIG	NS	NS	NS

Key - ***SIG = significant difference at 95% confidence level***
NS = no significant difference at 95% confidence level

2.4 Sand cover

High sand cover, in excess of 50%, has previously been recorded at all sites during certain surveys with the exception of Turangi Reef (Figure 5). In order to determine the extent to which sand cover impacts on intertidal communities at the sites studied, Pearson Correlation Coefficients (R values) were calculated using survey data collected between 1994 and 2013 (Table 4). Sand cover was found to be strongly negatively correlated with both species number and Shannon-Weiner index at Airedale, Orapa A and Greenwood Road (P <0.001, Table 4, Figure 6). At Orapa B, there was a significant negative correlation of sand cover with species number (R = -0.48, P = 0.031) but not Shannon-Weiner index (R = -0.39, P = 0.094). Correlations between sand cover and species diversity indicators were not significant at Turangi Reef (P >0.05, Table 4), potentially linked to the low sand cover typical at this site (Figures 5 and 6).

Table 4 Correlations between species number, Shannon-Weiner index and sand cover

Site	Species number - % sand cover		Shannon-Weiner index - % sand cover	
	R	P	R	P
Greenwood Rd	-0.77	**<0.001**	-0.79	**<0.001**
Orapa B	-0.48	**0.031**	-0.39	0.094
Orapa A	-0.90	**<0.001**	-0.96	**<0.001**
Airedale Reef	-0.79	**<0.001**	-0.85	**<0.001**
Turangi Reef	0.18	0.453	0.07	0.769
All sites	-0.74	**<0.001**	-0.78	**<0.001**

R values vary between 1 and -1 with positive values indicating a positive correlation and negative values indicating a negative correlation.
Yellow = significant correlation at the 95% confidence level (P <0.05)
Blue = correlation not significant at the 95% confidence level (P >0.05)

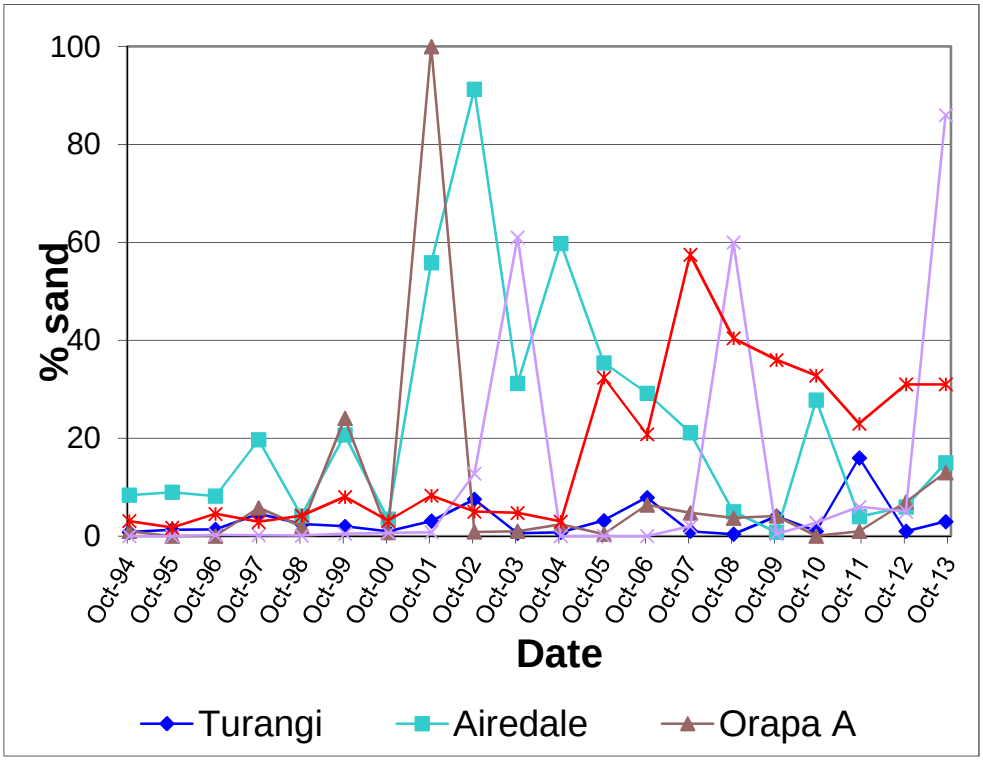
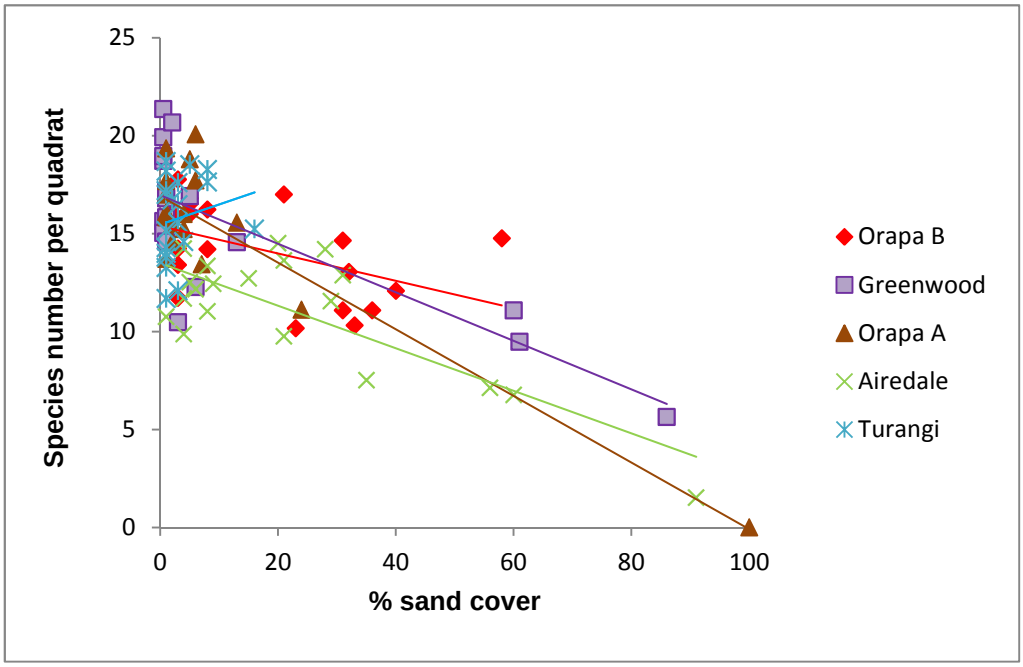


Figure 5 Percentage sand cover at the five reef sites October 1994 to September 2013



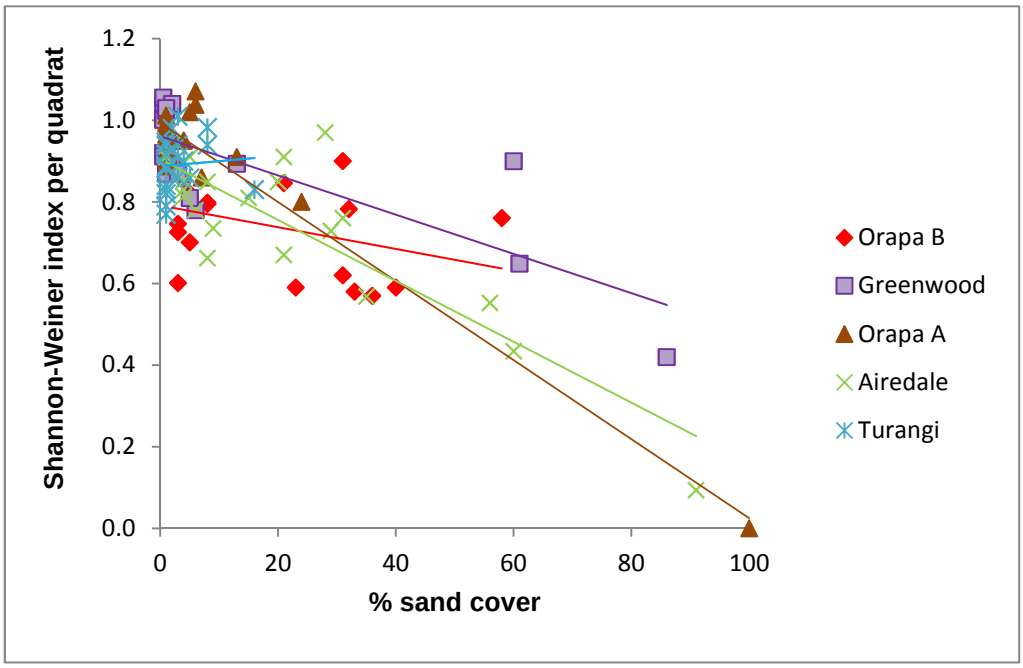


Figure 6 Relationship between species number, Shannon-Weiner index and percentage sand cover between 1994-2013

Table 5 Mean percentage cover of sand per quadrat 2011-2013

Site	% sand per quadrat		
	2011	2012	2013
Greenwood Rd	6	5	**86**
Orapa B	23	**31**	**31**
Orapa A	1	7	13
Airedale Reef	4	6	15
Turangi Reef	16	1	3

Sand coverage >30% can significantly impact marine communities.

During the three years covered by the current report (2011-2013), Orapa A, Airedale and Turangi all had relatively low sand levels, which would not have significantly impacted the reef sites. At Greenwood Road, although low sand cover was recorded in 2011 and 2012, during 2013 there was high sand inundation (86% cover, Table 4, Figure 5) which had an adverse effect on intertidal diversity (Sections 2.2 and 2.3). At Orapa B, sand coverage per quadrat remained above 20% during 2011, 2012 and 2013. Sand cover has been consistently high at this site since 2005 (Figure 5).

2.5 Comparison of 2011-2013 results with previous spring surveys

Table 6 provides a comparison of 2011-2013 results with the historic records from intertidal surveys conducted between 1985 and 2010. At Orapa A, Airedale Reef, and Turangi Reef, the number of species per quadrat and Shannon-Weiner index recorded for the 2011-2013 surveys were within the range of results collected during previous (1985-2010) surveys. The number of species per quadrat and Shannon-Weiner index at Orapa B in 2011 and at Greenwood Road in 2013 was the lowest on record for these sites (Table 6).

Table 6 Summary of spring Waitara Marine Outfall ecological surveys 1985-2010 compared with 2011, 2012 and 2013 results

Site	Parameter (per quadrat)	85-10 Mean	85-10 Max	85-10 Min	2011 Mean	2012 Mean	2013 Mean
Greenwood Road (No. of surveys = 22)	Number of species	16.22	21.36	9.48	12.28	16.92	5.64
	SW index	0.96	1.11	0.65	0.78	0.81	0.42
Orapa B (No. of surveys = 28)	Number of species	15.87	21.04	10.32	10.16	11.08	14.64
	SW index	0.94	1.11	0.69	0.59	0.62	0.90
Orapa A (No. of surveys = 28)	Number of species	16.39	21.76	0.00	15.84	13.44	15.56
	SW index	0.94	1.12	0.00	0.98	0.86	0.91
Airedale Reef (No. of surveys = 28)	Number of species	12.13	20.68	1.52	11.68	12.16	12.72
	SW index	0.79	1.13	0.09	0.83	0.78	0.81
Turangi Reef (No. of surveys = 23)	Number of species	15.93	18.68	11.68	15.24	15.16	16.48
	SW index	0.92	1.09	0.77	0.83	0.83	0.86

The survey results obtained at each of the sites between 1985 and 2013 are shown in Figure 7. With the exception of years associated with heavy sand inundation there has been no obvious trend in mean number of species and mean Shannon-Weiner index at Greenwood Road, Orapa A, Airedale Reef and Turangi Reef over the twenty eight year period examined. At Orapa B, a general decline in both mean number of species and mean Shannon-Weiner index occurred between 2006 and 2011. Since 2011 species diversity has recovered at this site (Figure 7).

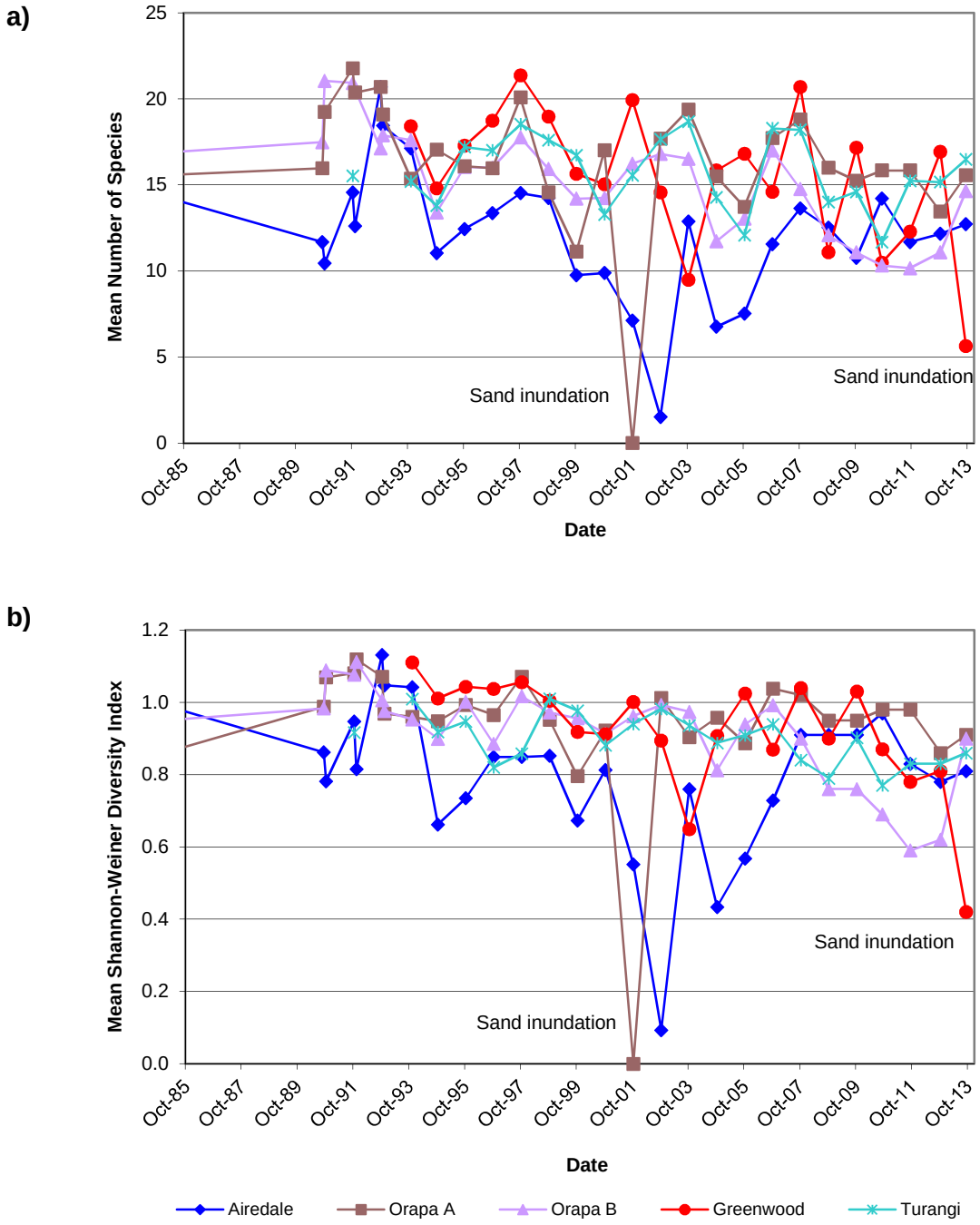


Figure 7 Comparison over time of a) mean number of species per quadrat and b) mean Shannon-Weiner diversity index per quadrat - spring 1985-2013

2.6 Investigations, interventions, and incidents

The monitoring programme 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 e.g. provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

The Taranaki Regional 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 Unauthorised Incident Register (UIR) includes events where the company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

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

In the January 2011-December 2013 period, there was one incident recorded with respect to Methanex Motunui Limited, details of which are provided in the TRC Technical report: Methanex Motunui and Waitara Valley Combined Monitoring Programme January 2012-June 2013 (TRC 2013-72). No environmental impacts were observed in relation to this incident.

With respect to NPDC, there were seven incidents recorded by the Council that were associated with the Waitara Wastewater Treatment Plant and associated pump stations. Over the period covered in this report, the level of reporting to the Council by NPDC was raised, with all recorded overflows being reported. For some discharges, it was clearly evident from the information provided that NPDC had operated in accordance with the approved Incident Response Plan and that no consent conditions had been breached. The six incidents described below were recorded in the TRC Incidents Register as further investigation was required to establish whether the Incident Response Plan had been followed. For six of the incidents it was found that the Incident Response Plan had been adhered to and that no follow up enforcement action was necessary. One incident (18 October 2013, described below) contravened the RMA and breached Special Condition 5, Consent 3397-2 resulting in an infringement notice being issued. This infringement notice has been taken into consideration when evaluating the environmental performance in the following report: New Plymouth District Council Waitara Waste Water Treatment Plant Monitoring Programme Report 2012-2013 (TRC 2013-86).

During May and July 2012 notifications were received concerning two overflows from the Queen Street pump station and the Richmond Street Pump station in Waitara. These notifications raised concerns with Council staff regarding frequency of events and whether the contingency plan was being adhered to. A letter of explanation was received and accepted. NPDC operated in accordance with the approved Incident Response Plan.

On 9 September 2012 self-notification was received from the NPDC about pump failures and possible overflows at some of the Waitara pump stations. An inspection of the pump stations found no evidence of any overflow or any noticeable odours around them. Further information received from NPDC showed that a discharge occurred as a result of failure of the duty and back up pumps. The problem was not apparent immediately due to failure with the alarm system. NPDC did operate in accordance with the approved Incident Response Plan and did not breach Special Condition 9 Consent 3397-2.

On 27 December 2012 notification was received from NPDC regarding a sewage discharge into Unnamed Stream 64 from a broken pipe. Investigation found that the stream was running clean and clear. The pipe had been fixed the previous night and sewage was no longer discharging into the stream.

On 14 July 2013 notification was received concerning a sewage overflow on Queens Street, Waitara. City Care had undertaken works to control and fix the overflow. Inspection showed that a clean up had been undertaken and there were no visual effects on surrounding areas or water courses.

On 18 October 2013 notification was received concerning a discharge of sewage from the Waitara WWTP. A letter of explanation was received which outlined that a series of human errors had resulted in the discharge of approximately 361 m^3 of unscreened and untreated sewage to the Tasman Sea via the Waitara Outfall. The investigation by NPDC concluded the following causes:

1) Poor communication on methodology for work;
2) Different supervising technicians for the removal and installation of equipment;
3) Issues with obtaining appropriate authorisation;
4) Permit to work process not fully followed; and
5) SCADA alarms not generated as expected.

As a result of this discharge NPDC were issued with an infringement notice (383).

On 6 November 2013 notification was received concerning a discharge of sewage from the Queen Street Pump Station, Waitara. The overflow alarm occurred when the electrician onsite became distracted during fault finding. In addition, the overflow alarm was triggered prematurely because the float had been set at the incorrect level. Due to the discharge of treated effluent from the Waitara WWTP at the time, any discharge that occurred from the pump station as a result of this incident would have been substantially diluted. In response to the potential discharge NPDC did operate in accordance with the approved Incident Response Plan.

3. Discussion

3.1 Environmental effects of exercise of consents

Potential impact of the Waitara Marine Outfall discharge on the local intertidal communities can be assessed through comparison of results from potential impact sites and control sites within the same year in addition to the analysis of trends over time. The data analysed in this report covers a twenty three year continuous record of species diversity from September 1990 to September 2013. Data collected during 1985 and 1986 was also included in statistical comparisons as this data was collected using comparable methods.

Impacts of the Waitara Marine Outfall discharge on the local intertidal communities were not evident from the 2011, 2012 and 2013 survey results. Diversity indicators were not consistently significantly higher at the control sites relative to the potential impact sites. The historical record of survey results (Figure 7) showed no detectable impact of the Waitara Marine Outfall discharge on the local intertidal communities over the last twenty three years. Both control and potential impact sites showed interannual variability and there were no obvious declining trends in potential impact sites relative to control sites.

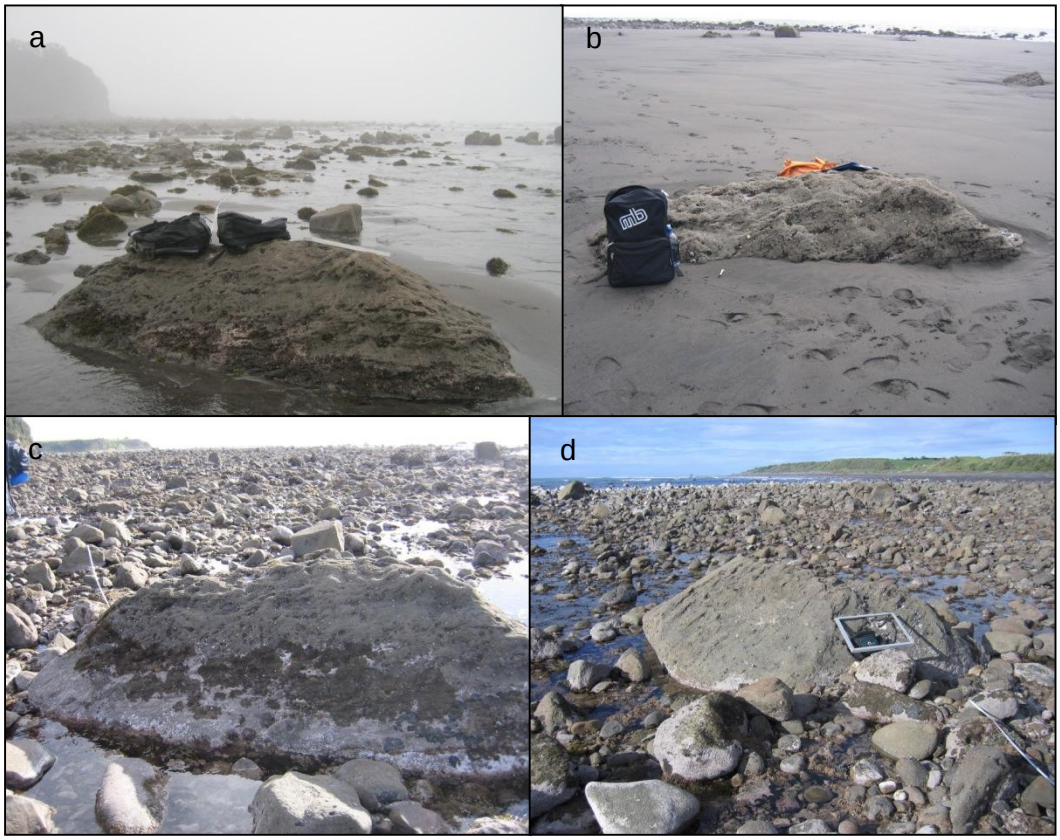


Photo 6 Varying levels of sand inundation at the Greenwood Road starting rock a) Sept 2013, b) Oct 2010, c) Oct 2007, d) Oct 2007

Note: the 2010 image was taken one month after the Sept 2010 Waitara WWTP survey

Spatial and interannual variability could mainly be attributed to natural changes in physical characteristics of the habitats. In particular, sand cover was a major driver of diversity, as indicated by the strong negative correlations between number of species

and Shannon-Weiner index with sand cover at Greenwood Road, Orapa A and Airedale (Table 4, Figure 6). This strong negative correlation between intertidal diversity and sand cover is not surprising given that sand deposition has been shown to have a profound effect on under-rock colonisation on intertidal hard-shore environments in Taranaki (Walsby, 1982). Sand cover can result in reduced diversity due to sand scour of the biota, reduced water movement between rocks and temporary sand burial. A combination of these three effects is likely to have resulted in the relatively low species number and Shannon-Weiner index recorded at the Greenwood Road sit during the 2013 survey. In common with Airedale and Orapa A, the site at Greenwood Road is susceptible to sporadic heavy sand inundation (Photograph 6).

At Orapa B, sand percentage coverage has remained >20% since 2005 (Figure 5). From 2005 up until 2011, both mean number of species per quadrat and mean Shannon-Weiner index per quadrat steadily declined, reaching the lowest values recorded for over 20 years in 2011 (Table 6, Figure 7). Over this period, the Orapa B site became increasingly dominated by the colonial tube worm *Neosabellaria kaiparaensis* (Figure 8, Photograph 7). Although generally uncommon in New Zealand, large colonies of this endemic polychaete occur around the Taranaki coastline. *Neosabellaria kaiparaensis* thrives in sand rich environments, and domination of this species can prevent other rock dwelling organisms from colonising the area. In September 2012, although *N. kaiparaensis* cover remained relatively high (42%), it was noted that colonies were in poor condition with eroded tubes, enabling establishment of other species. In 2013, mean percentage cover of *N. kaiparaensis* had dropped to <10% enabling establishment of more diverse intertidal communities (Figure 7). It must be stressed that there is no evidence that the changes in sand cover and species diversity at this site is in anyway related to the Waitara Marine Outfall.

Photo 7 ***Neosabellaria kaiparaensis*** at the Orapa B site

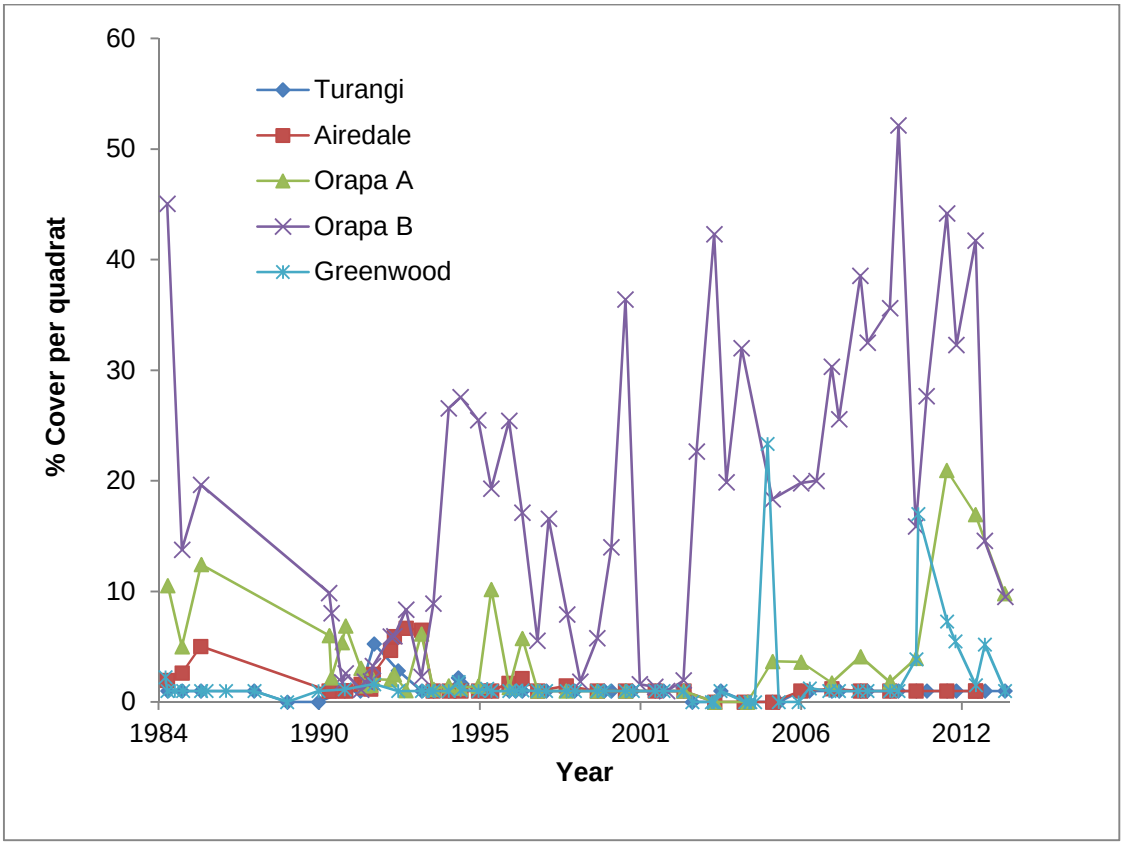


Figure 8 Mean percentage cover of ***Neosabellaria kaiparaensis*** per quadrat spring 1985-2013

3.2 Evaluation of performance

A summary of the compliance record for the year under review is set out in Tables 7-10.

Table 7 Summary of performance for Consent 3397-2 to discharge up to 11,950 m^3/day of treated municipal wastes generated in Waitara Township via a marine outfall

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Discharge volume over 24 h period not to exceed 11,950 m^3, rate of discharge not to exceed 138 L/s	Data submitted to TRC in monthly and annual reports by NPDC (Appendix IV).	Yes
2. Cease discharge after Waitara to New Plymouth pipeline is commissioned	Pipeline due to be commissioned during summer 2014.	N/A
3. pH 6-12 in at least 98% of discharge samples over 12 month period	Data submitted to TRC in monthly and annual reports by NPDC (Appendix IV).	**Not quite:** **97.3% pH 6-12** See Appendix IV
4. Suspended Solids, COD, Oil & Grease and Ammoniacal Nitrogen not to exceed maximum concentrations	Data submitted to TRC in monthly and annual reports by NPDC (Appendix IV).	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
5. Feacal coliforms in discharge not to exceed 50,000 cfu/100ml	Data submitted to TRC in monthly and annual reports by NPDC (Appendix IV).	Yes
6. Discharge not to give rise to effects in Tasman Sea beyond 200m	Monitored as part of TRC Beach Bathing Programme.	Yes
7. Monthly reports	Monthly electronic reports provided by NPDC, including a comprehensive explanation of results.	Yes The level of detail provided by NPDC has aided TRC staff with interpretation of results
8. Annual report	Comprehensive annual reports provided by NPDC (Appendix 4). 2012-2013 Report received July 2013.	Yes
9. Contingency plan	Updates of the NPDC Water & Wastes Incident Response Plan received February 2012 and June 2013	Yes
10. Inflow and infiltration annual report, Waitara to New Plymouth pipeline construction update	Waitara Inflow and Infiltration June 2012 Report received November 2012 (Appendix V). Most recent pipeline update provided September 2013.	Yes
11. Trade waste agreement	No new Trade Waste Consents granted and no modifications to existing consents.	Yes
12. Signage	Signs erected. Wording agreed with TDHB.	Yes
13. Record of complaints	Record of enquires maintained by NPDC. Summary of enquiries provided in annual report (Appendix IV).	Yes
14. Community liaison	Most recent annual meeting held 6 December 2012	Yes
15. Virus monitoring of mussel flesh	To be undertaken following commissioning of the Waitara to New Plymouth sewer pipeline.	N/A
16. Review of consent		N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**Good**

N/A = not applicable

Table 8 Summary of consent 3399-2 to discharge treated wastewater and stormwater from the Waitara Valley methanol plant into the Tasman Sea via the Waitara Marine Outfall

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent holder to adopt BPO to prevent or minimise adverse effects	Inspections (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 5000m^3 day, 60L/sec	Monthly reports received	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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
5. Maximum daily discharge of suspended solids 500 kg	Monthly reports	Yes
6. pH not to exceed range of 6 to 9	Monthly reports. Limits breached on two occasions, pH = 5.9 on 17 June 2011 and 21 June 2011.	No
7. Limits on concentration of COD, hydrocarbons, methanol, ammonia, copper, nickel, zinc	Monthly reports	Yes
8. Allowable water treatment chemicals and volumes	Inspection and liaison with consent holder	Yes
9. Approval from TRC required to discharge 'equivalent' chemical	Requested 14 June 2013, granted 29 July 2013	Yes
10. Definition of 'equivalent'		N/A
11. Discharge of equivalent chemical requires written request	Requested 14 June 2013, granted 29 July 2013	Yes
12. Conditions 5,6,7 and 8 apply to effluent prior to entry into outfall line		N/A
13. Limits in conditions 7 and 8 apply unless TRC has given approval for a short term change	No approval given	N/A
14. Effects on receiving waters	Marine ecological surveys	Yes
15. Consent holder to maintain contingency plan	Contingency plan received 2011 and 2012	Yes
16. No domestic sewage in discharge after closure of Waitara Municipal Treatment Plan	Domestic sewage discharge to land	Yes
17. Consent holder to certify the structural integrity and dilution performance of outfall at least every five years	A commercial diver survey was undertaken to inspect the integrity of the outfall in July 2006, ongoing discussion with Council with regard to re-inspection.	Yes
18. Consent holder to supply an annual report by 31 March each year	Reports received	Yes
19. Lapse of consent		N/A
20. Review of consent	Next scheduled in 2015 if required	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**Good**

N/A = not applicable

Table 9 Summary of consent 3400-2 to discharge treated wastewater and stormwater from the Motunui methanol plant into the Tasman Sea via the Waitara Marine Outfall

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Consent holder to adopt BPO to prevent or minimise adverse effects	Inspections liaison and review of reported data	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
2. Consent holder to maintain a record of the volume of effluent discharged each day	Monthly reports provided	Yes
3. Maximum daily discharge 12,096m^3 day, 140L/sec	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
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. Four occasions in 2012 when pH was outside consented range.	No
7. Limits on concentration of COD, hydrocarbons, methanol, ammonia, 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. Variation granted July 2012 for increase in Spectrus CT1300.	Yes
9. Approval from TRC required to discharge 'equivalent' chemical	Permission for approval to replace two chemicals applied for 18 October 2012 and granted 1 November 2012.	Yes
10. Definition of 'equivalent'	N/A	N/A
11. Discharge of equivalent chemical requires written request	Not required	N/A
12. Conditions 5,6,7 and 8 apply to effluent prior to entry into outfall line		N/A
13. Limits in conditions 7 and 8 apply unless TRC has given approval for a short term change	Not required	N/A
14. Effects on receiving waters	Marine ecological surveys	Yes
15. Consent holder to maintain contingency plan	Contingency plans provided June 2011 and Jun2 2012 and reviewed as satisfactory.	Yes
16. No domestic sewage in discharge	Liaison with consent-holder domestic sewage is routed to the Waitara Wastewater Treatment Plant, not directly to the outfall	Yes
17. Consent holder to notify TRC at least seven days before consent is first exercised	Notification on file	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
18. Consent holder to certify the structural integrity and dilution performance of outfall at least every five years	A commercial diver survey was undertaken to inspect the integrity of the outfall in July 2006. In April 2013 there were further discussions regarding the outfall between Methanex and Council Management.	Yes
19. Consent holder to supply an annual effluent report by 31 March each year	Report received and reviewed as satisfactory	Yes
20. Lapse of consent		N/A
21. Review of consent	Next scheduled in 2015 if required	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**Good**

Table 10 Summary of consent 4599-2 to erect, place and maintain a marine outfall structure and to occupy the associated coastal space

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Maintain outfall structure to satisfaction of Council	During the 2012-2013 season, a number of dives have been undertaken by OCEL to undertake repair work to the outfall pipeline anchorages.	Yes
2. Notification prior to maintenance work		N/A
3. Optional review of consent	Next scheduled in June 2015 if required	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

Over the three years, with respect to marine ecology, NPDC and Methanex demonstrated a good level of environmental performance and compliance with the resource consents.

Breaches of discharge pH are discussed and evaluated in a separate report (Waitara Waste Water Treatment Plant Monitoring Programme Report). It is anticipated that detectable adverse effects of the Waitara Marine Outfall discharge on the intertidal community would have been evident as a significant decline in ecological diversity at the potential impact sites relative to control sites. No such decline occurred in 2011, 2012 and 2013.

3.3 Recommendations from the 2010 Annual Report

In the 20010 Annual Report, it was recommended:

1. THAT the Waitara Outfall marine ecological monitoring programme continues during the 2011 year in a similar manner to the 2010 monitoring programme.

2. THAT should any adverse ecological effect arise as a result of the Waitara Marine Outfall as indicated by the monitoring programme, the level of monitoring shall return to that of two annual surveys.

Both of these recommendations were followed. In relation to recommendation 2, there was no evidence of an adverse ecological effect, and so monitoring was maintain at its existing level.

3.4 Alterations to monitoring programmes for 2014

In designing and implementing the monitoring programmes for water discharges in the region, the Taranaki Regional Council has taken into account the extent of information made available by previous authorities, its relevance under the Resource Management Act, the obligations of the Act in terms of monitoring discharges and effects, and subsequently reporting to the regional community, 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 discharging to the environment.

In the case of the Waitara Marine Outfall, the programme for 2011, 2012 and 2013 was unchanged from that for 2010 on the grounds that no adverse marine ecological effects arose as a result of the wastewater discharge. Similarly, it is proposed that for 2014, the programme should continue at its current residual level. A recommendation to this effect is attached to this report.

4. Recommendations

1. THAT the Waitara Outfall marine ecological monitoring programme continues during the 2014 year in a similar manner to the 2013 monitoring programme.

2. THAT should any adverse ecological effect arise as a result of the Waitara Marine Outfall as indicated by the monitoring programme, the level of monitoring shall return to that of two annual surveys.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

BPO	Best practicable option, as defined in section 2 of the Resource Management Act 1991
COD	Chemical oxygen demand
Ecology	Relationship between organisms and their environment
Intertidal	Between the low water and high water marks
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment.
Quadrat	A square metal frame of a known area used to study the abundance and diversity of animals and plants within this area
Qualitative	Relates to the quality or character of what is being surveyed
Quantitative	Capable of being measured or expressed in numerical terms
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15)
RMA	Resource Management Act 1991 and subsequent amendments
Species diversity	Numerical measure combining the number of species in an area with their relative abundance
Transect	Tape run along the shoreline where the random quadrats are taken from
UI	Unauthorised Incident
UIR	Unauthorised 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

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Taranaki Regional Council, 2013: Waitara Waste Water Treatment Plant Monitoring Programme Report 2012-13. Taranaki Regional Council Technical Report 2013-86.

Appendix I

Resource consents

TARANAKI REGIONAL COUNCIL
CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE: 06-765 7127
FAX: 06-765 5097
www.trc.govt.nz
Please quote our file number on all correspondence

Coastal Permit

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

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 NEW PLYMOUTH 4342
Decision Date:	15 November 2011
Commencement Date:	13 December 2011

Conditions of Consent

Consent Granted:	To discharge up to 11,950 m^3/day (138 litres/second) of treated wastewater from the Waitara Wastewater Treatment Plant into the Tasman Sea via the Waitara Marine Outfall at or about (NZTM) 1705938E-5685058N
Expiry Date:	1 June 2017
Review Date(s):	Within one month of receiving notification of a new and/or modified trade waste agreement required under condition 11
Site Location:	Waitara Marine Outfall - At Or Beyond 1250 Metres off-shore from the Waitara River Mouth
Catchment:	Tasman Sea Waitara River

General condition

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

Special conditions

Effluent quality and standards

1. The discharge volume over any 24-hour period shall not exceed 11,950m^3 and the rate of discharge shall not exceed 138 litres/second.

2. The consent holder shall cease the discharge authorised by this consent as soon as practicable after the Waitara to New Plymouth pipeline is commissioned to pump Waitara wastewater to the New Plymouth Wastewater Treatment Plant for treatment, bearing in mind the requirements of condition 15.

3. The pH of the discharge shall be within the range of pH 6 to pH 12 in at least 98% of the monitoring samples undertaken over any 12 month period ending 30 June.

4. On the basis of 24-hour flow proportioned composite samples, constituents of the discharge shall not exceed the following concentrations:

Constituent	Maximum concentration (g/m^3)
Suspended solids	1000
Chemical oxygen demand	800
Oil and grease	200
Ammoniacal nitrogen	50

5. On the basis of grab samples taken, the concentration of faecal coliforms in the discharge shall not exceed 50,000 per 100 millilitres.

6. The discharge authorised by this consent shall not give rise to any of the following effects in the Tasman Sea beyond a mixing zone of 200 metres from the centre line of the outfall diffuser:

   (a) the production of 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; and
   (d) any significant effects on aquatic life.

Monitoring and reporting requirements

7. The consent holder shall monitor and record the parameters of the discharge to demonstrate that the conditions of this consent are being complied with. This record shall be in an electronic format and submitted to the Taranaki Regional Council on a monthly basis. The consent holder is to consult with the Taranaki Regional Council as to the record format. Following this consultation, the record format is to be undertaken as advised by the Chief Executive, Taranaki Regional Council.

8. The consent holder shall prepare and submit an Annual Report to the Chief Executive, Taranaki Regional Council, by 31 July each year that includes, but is not necessarily limited to, the following information:

   (a) details of any plant maintenance undertaken and an overview of the plant performance;
   (b) details of any outfall or pump station(s) maintenance undertaken and an overview of the performance of the outfall and pump stations;
   (c) details of any overflow events and/or system failures which result in untreated or partially treated wastewater discharges at the plant and/or pump stations; and
   (d) details of any complaints received in accordance with condition 13.

Overflow contingency plan

9. The consent holder shall review and update the *NPDC Sewer System Emergency Contingency Plan* (dated August 2008) in consultation with the Taranaki District Health Board. The updated Plan shall detail measures and procedures to be undertaken to prevent the discharge of partially or untreated wastewater from the Waitara wastewater reticulation network or treatment plant not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a discharge. The plan shall be submitted for approval to the Chief Executive, Taranaki Regional Council, acting within a certification capacity, within three months of the date of commencement of this consent.

   The consent holder shall operate in accordance with the approved Plan.

Inflow and Infiltration, and transfer pipeline construction

10. The consent holder shall prepare and submit a report (annually for the information required by subconditions (a) and (b), and quarterly for the information required by subconditions (c) and (d)) that includes, but is not necessarily limited to, the following information:

    (a) details of the proposed works, staging and a timeline for reducing inflow and infiltration to a level where the 'Waitara to New Plymouth sewer pipeline' will continue to meet the design specifications in achieving an overflow frequency discharge occurrence of <1% per year, averaged over a five year period;
    (b) in relation to a) above, details of the progress undertaken towards achieving the specified works;

(c) details of the proposed works, staging and a timeline for constructing and commissioning the 'Waitara to New Plymouth sewer pipeline'; and
(d) in relation to c) above, details of the progress undertaken towards achieving the specified works.

The report in (a) and (b) shall be submitted to the Chief Executive, Taranaki Regional Council, by 15 December of each year.

The report in (c) and (d) shall be submitted to the Chief Executive, Taranaki Regional Council, by 31 March, 30 June, 30 September, and 15 December of each year until implementation is complete.

Trade waste agreements

11. The consent holder shall notify and consult with the Taranaki Regional Council if any new trade waste agreements are formed and/or any existing trade waste agreements are modified, for which it may be appropriate or necessary to place limits on the concentrations of the treated wastewater of any toxic or hazardous contaminants which may be contained in that trade waste. If such limits are considered necessary, a review of the consent conditions may be undertaken in accordance with condition 16 of this consent.

Signage

12. The consent holder shall maintain four signs placed on or near the shoreline in the following areas:

(a) Waitara West Beach – Marine Park and Battiscombe Terrace Reserve; and

(b) Waitara East Beach – near the Waitara Swimming and Surf Life Saving Club and the termination of the access walkway by the Waitara Golf Club;

The consent holder shall consult with Taranaki District Health Board regarding the wording of the signs to ensure that the signs advise the public of the discharge of untreated sewage and appropriately inform the community of the potential health risks.

Complaints

13. The consent holder shall keep a record of any complaints that are received. The record shall contain the following details, where practicable:

(a) name and address of the complainant;
(b) identification of the nature of the complaint;
(c) date and time of the complaint and of the alleged event;
(d) weather conditions at the time of the complaint; and
(e) any measures taken to address the cause of the complaint.

The consent holder shall notify the Taranaki Regional Council of any complaints relating to the exercise of this consent, and forward on any details recorded in relation to any complaint[s] received, as soon as practicable.

The consent holder shall also provide details of any complaints received in the Annual Report required by condition 8.

Note: For notification purposes, at the grant date of this consent, the Taranaki Regional Council's phone number is 0800 736 222 [24 hour service].

Community liaison

14. At least once a year the consent holder shall convene a meeting of representatives of Taranaki Regional Council, Otaraua, Manukorihi, Ngati Rahiri, and other interested submitters on application 5011, to discuss any matter relating to the operation or monitoring of this consent.[1]

Virus monitoring

15. The consent holder shall survey for microbiological contamination within mussel shellfish from two impact sites and one control site on one occasion and as soon as practicable following the commissioning of the 'Waitara to New Plymouth sewer pipeline'. The results of the survey shall be provided to the Taranaki Regional Council and the Taranaki District Health Board. The consent holder shall consult with the Taranaki Regional Council in regards to the survey methodology, timing of the survey and reporting requirements.

The consent holder shall not surrender this consent prior to the requirements of this condition being fulfilled.

Review

16. In accordance with sections 128 and 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 within one month of receiving notification of a new and/or modified trade waste agreement required 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, and in particular to address any more than minor adverse effects relating to coastal water quality.

Signed at Stratford on 13 December 2011

For and on behalf of
Taranaki Regional Council

Director-Resource Management

[1] For the avoidance of doubt, this meeting can be combined with the annual meetings required under consents 0882-4 and 7861-1.

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 ±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:

Constituent	Standard
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.

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.

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

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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 ±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.

Constituent	**Standard**
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.

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.

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

Consent 4599-2

TARANAKI REGIONAL COUNCIL
CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE: 06-765 7127
FAX: 06-765 5097
www.trc.govt.nz

Please quote our file number on all correspondence

Coastal Permit

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

Name of Consent Holder:	New Plymouth District Council & Methanex Motunui Ltd Private Bag 2025 NEW PLYMOUTH 4340
Consent Granted Date:	14 September 2007

Conditions of Consent

Consent Granted:	To erect, place and maintain a structure [known as the "Waitara Marine Outfall"] and to occupy the associated space in the coastal marine area at or about 2615700E-6246700N
Expiry Date:	1 June 2021
Review Date(s):	June 2009, June 2015
Site Location:	Tasman Sea
Catchment:	Tasman Sea Waitara

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 structure authorised by this consent is as shown in drawing DR-960312-005 [prepared by OCEL Consultants Ltd and provided with the application]. The consent holder shall ensure that at all times the structure is maintained to standard fit for the purpose it was designed and substantially in accordance with drawing DR-960312-005.

2. That the consent holders shall notify the Taranaki Regional Council at least 24 hours prior to undertaking any maintenance works. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

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.

Signed at Stratford on 14 September 2007

For and on behalf of
Taranaki Regional Council

Chief Executive

Appendix II

Summary of spring survey results 1985 - 2013

Greenwood Road	No. of Quadrats	No. algae	No. animals	No. total species	SW index: algae	SW index: animals	SW index: total species	Sand % cover
September 1985	40	4.90	12.52	17.42	0.537	0.895	1.030	-
November 1993	10	5.40	13.00	18.40	0.628	0.964	1.110	-
October 1994	25	3.72	11.08	14.80	0.494	0.874	1.011	-
October 1995	25	4.28	13.00	17.27	0.470	0.926	1.043	-
October 1996	25	5.56	13.16	18.72	0.680	0.875	1.037	<1
October 1997	25	5.32	16.04	21.36	0.587	0.954	1.056	<1
October 1998	25	3.88	15.08	18.96	0.450	0.909	1.004	<1
October 1999	25	3.60	12.04	15.64	0.333	0.861	0.920	<1
October 2000	25	4.76	10.28	15.04	0.470	0.789	0.912	<1
October 2001	25	5.64	14.28	19.92	0.579	0.881	1.001	<1
October 2002	25	4.92	9.64	14.56	0.495	0.786	0.894	13
October 2003	25	4.44	5.04	9.48	0.53	0.395	0.649	61
October 2004	25	7.84	8	15.84	0.724	0.621	0.907	<1
October 2005	25	6.84	9.96	16.8	0.687	0.801	1.024	<1
September 2006	25	5.04	9.56	14.6	0.502	0.66	0.869	<1
September 2007	25	7.8	12.88	20.68	0.64	0.83	1.04	2
September 2008	25	5.12	5.96	11.08	0.60	0.61	0.90	60
October 2009	25	6.00	11.16	17.16	0.56	0.85	1.03	<1
September 2010	25	4.56	5.92	10.48	0.51	0.62	0.87	3
September 2011	25	4.36	7.92	12.28	0.60	0.60	0.78	6
September 2012	25	7.20	9.70	16.92	0.69	0.61	0.81	5
September 2013	25	2.24	3.40	5.64	0.26	0.29	0.42	86

Orapa B	No. of Quadrats	No. algae	No. animals	No. total species	SW index: algae	SW index: animals	SW index: total species	Sand % cover
September 1985	40	4.35	12.60	16.95	0.495	0.847	0.954	-
September 1990	25	3.76	13.72	17.48	0.492	0.880	0.983	-
October 1990	25	5.64	15.40	21.04	0.667	0.971	1.089	-
October 1991	25	6.16	14.76	20.92	0.695	0.924	1.077	-
November 1991	25	5.84	14.72	20.56	0.667	0.979	1.112	-
October 1992	15	4.46	12.66	17.13	0.548	0.878	1.006	-
November 1992	25	4.64	13.24	17.88	0.562	0.869	0.976	-
October 1993	25	4.92	12.68	17.60	0.611	0.840	0.953	-
October 1994	25	4.52	8.87	13.40	0.505	0.746	0.899	3
October 1995	25	3.80	12.24	16.04	0.437	0.906	1.002	2
October 1996	25	5.60	10.40	16.00	0.577	0.701	0.885	5
October 1997	25	5.16	12.60	17.76	0.575	0.881	1.017	3
October 1998	25	3.72	12.20	15.92	0.426	0.853	0.972	4
October 1999	25	4.32	9.88	14.20	0.477	0.795	0.960	8
October 2000	25	5.40	8.84	14.24	0.589	0.726	0.913	3
October 2001	25	5.28	10.96	16.23	0.538	0.798	0.962	8
October 2002	25	5.68	11.12	16.8	0.586	0.813	0.993	5
October 2003	25	5.40	11.12	16.52	0.686	0.820	0.974	5
October 2004	25	4.76	6.96	11.72	0.569	0.601	0.812	3
October 2005	25	4.84	8.19	13.04	0.507	0.782	0.939	32
October 2006	25	6.28	10.72	17.00	0.646	0.846	0.992	21
October 2007	25	4.88	9.88	14.76	0.540	0.760	0.900	58
October 2008	25	4.52	7.56	12.08	0.46	0.59	0.76	40
October 2009	25	4.48	6.60	11.08	0.50	0.57	0.76	36
September 2010	25	2.36	7.96	10.32	0.20	0.58	0.69	33
September 2011	25	3.12	7.04	10.16	0.35	0.59	0.73	23
September 2012	25	4.28	6.80	11.08	0.50	0.62	0.77	31
September 2013	25	4.80	9.84	14.64	0.52	0.76	0.90	31

Orapa A	No. of Quadrats	No. algae	No. animals	No. total species	SW index: algae	SW index: animals	SW index: total species	Sand % cover
September 1985	40	3.77	11.85	15.62	0.513	0.774	0.876	0.5
September 1990	25	3.92	12.04	15.96	0.486	0.876	0.988	-
October 1990	25	5.88	13.36	19.24	0.622	0.929	1.069	-
October 1991	25	6.24	15.52	21.76	0.714	0.947	1.081	-
November 1991	25	5.28	15.08	20.36	0.678	0.989	1.119	-
October 1992	25	5.04	15.64	20.68	0.641	0.951	1.071	-
November 1992	25	4.96	14.12	19.08	0.625	0.847	0.969	-
October 1993	25	4.88	10.48	15.36	0.525	0.801	0.960	-
October 1994	25	3.96	13.08	17.04	0.452	0.847	0.948	1
October 1995	25	3.52	12.56	16.08	0.383	0.896	0.993	<1
October 1996	25	5.36	10.60	15.96	0.589	0.804	0.965	<1
October 1997	25	4.92	15.16	20.07	0.595	0.950	1.071	6
October 1998	25	4.24	10.32	14.56	0.452	0.809	0.952	2
October 1999	25	3.12	8.00	11.12	0.374	0.666	0.800	24
October 2000	25	4.92	12.08	17.00	0.526	0.801	0.922	<1
October 2001	25	0	0	0	0	0	0	100
October 2002	25	4.88	12.8	17.68	0.51	0.886	1.012	<1
October 2003	25	6.60	12.76	19.36	0.792	0.741	0.904	1
October 2004	25	5.08	10.4	15.48	0.539	0.797	0.958	2
October 2005	25	4.72	9.00	13.72	0.534	0.731	0.887	<1
October 2006	25	6.12	11.60	17.72	0.703	0.872	1.038	6
October 2007	25	5.08	13.72	18.80	0.570	0.880	1.020	5
October 2008	25	4.04	11.96	16.00	0.40	0.83	0.95	4
October 2009	25	5.08	10.16	15.24	0.49	0.82	0.95	4
September 2010	25	3.28	12.56	15.84	0.40	0.87	0.98	<1
September 2011	25	3.40	9.12	12.52	0.42	0.75	0.88	-
September 2012	25	4.16	9.28	13.44	0.45	0.72	0.86	7
September 2013	25	4.60	10.96	15.56	0.53	0.79	0.91	13

Airedale Reef	No. of Quadrats	No. algae	No. animals	No. total species	SW index: algae	SW index: animals	SW index: total species	Sand % cover
September 1985	40	3.27	10.75	14.02	0.373	0.874	0.976	3.6
September 1990	25	2.92	8.76	11.68	0.443	0.729	0.862	-
October 1990	25	3.12	7.32	10.44	0.437	0.633	0.782	-
October 1991	25	3.32	11.24	14.56	0.380	0.850	0.947	-
November 1991	25	3.72	8.87	12.60	0.460	0.667	0.815	-
October 1992	25	4.60	16.08	20.68	0.578	1.025	1.131	-
November 1992	25	4.88	13.56	18.44	0.586	0.920	1.047	-
November 1993	25	4.68	12.44	17.12	0.478	0.917	1.042	-
October 1994	25	3.00	8.04	11.04	0.400	0.503	0.662	8
October 1995	25	3.60	8.84	12.44	0.425	0.579	0.735	9
October 1996	25	3.76	9.60	13.36	0.462	0.716	0.849	8
October 1997	25	4.59	9.92	14.52	0.517	0.678	0.849	20
October 1998	25	2.76	11.48	14.24	0.371	0.771	0.852	4
October 1999	25	2.36	7.40	9.76	0.288	0.564	0.670	21
October 2000	25	3.00	6.88	9.88	0.370	0.674	0.813	4
October 2001	25	2.16	4.96	7.12	0.287	0.428	0.552	56
October 2002	25	0.52	1	1.52	0.067	0.063	0.093	91
October 2003	25	4.68	8.19	12.88	0.591	0.565	0.760	31
October 2004	25	2.27	4.48	6.76	0.309	0.309	0.434	60
October 2005	25	1.36	6.16	7.52	0.113	0.478	0.568	35
October 2006	25	2.52	9.03	11.56	0.239	0.614	0.729	29
October 2007	25	2.56	11.08	13.64	0.310	0.830	0.910	21
October 2008	25	2.20	10.32	12.52	0.24	0.84	0.91	5
October 2009	25	1.96	8.80	10.76	0.22	0.85	0.91	<1
September 2010	25	2.20	12.00	14.20	0.26	0.89	0.97	28
September 2011	25	2.04	9.64	11.68	0.21	0.75	0.83	4
September 2012	25	3.16	9.00	12.16	0.41	0.64	0.78	6
September 2013	25	3.52	9.20	12.72	0.38	0.69	0.81	15

Turangi Road	No. of Quadrats	No. algae	No. animals	No. total species	SW index: algae	SW index: animals	SW index: total species	Sand % cover
September 1985	40	6.62	12.05	18.67	0.628	0.930	1.093	-
September 1991	25	3.84	11.68	15.52	0.522	0.802	0.917	-
November 1993	15	4.40	10.80	15.20	0.461	0.888	1.009	-
October 1994	25	3.76	10.04	13.80	0.405	0.797	0.918	<1
October 1995	25	5.07	12.12	17.20	0.493	0.779	0.947	1
October 1996	25	4.80	12.20	17.00	0.585	0.693	0.820	1
October 1997	25	6.32	12.20	18.52	0.630	0.677	0.858	5
October 1998	25	3.68	13.92	17.60	0.411	0.931	1.010	3
October 1999	25	3.88	12.84	16.72	0.437	0.878	0.980	2
October 2000	25	3.88	9.40	13.28	0.431	0.765	0.881	1
October 2001	25	5.04	10.52	15.56	0.485	0.819	0.940	3
October 2002	25	5.96	11.68	17.64	0.52	0.852	0.982	8
October 2003	25	6.48	12.2	18.68	0.748	0.776	0.938	<1
October 2004	25	4.8	9.48	14.28	0.519	0.738	0.888	<1
October 2005	25	5.28	6.8	12.08	0.563	0.696	0.909	3
October 2006	25	5.36	12.92	18.28	0.556	0.793	0.939	8
October 2007	25	5.88	12.32	18.2	0.55	0.65	0.84	1
October 2008	25	3.52	10.48	14.00	0.43	0.64	0.79	<1
October 2009	25	4.72	9.88	14.60	0.49	0.73	0.90	4
September 2010	25	2.56	9.12	11.68	0.32	0.66	0.77	1
September 2011	25	3.84	11.40	15.24	0.38	0.73	0.83	16
October 2012	25	4.20	10.96	15.16	0.47	0.70	0.83	1
September 2013	25	4.40	12.08	16.48	0.40	0.70	0.86	3

Appendix III

Statistical summary 2011 and 2012

2011: Number of species per quadrat

Figure 1A shows the total number of species per quadrat at each site as a box and whisker plot.

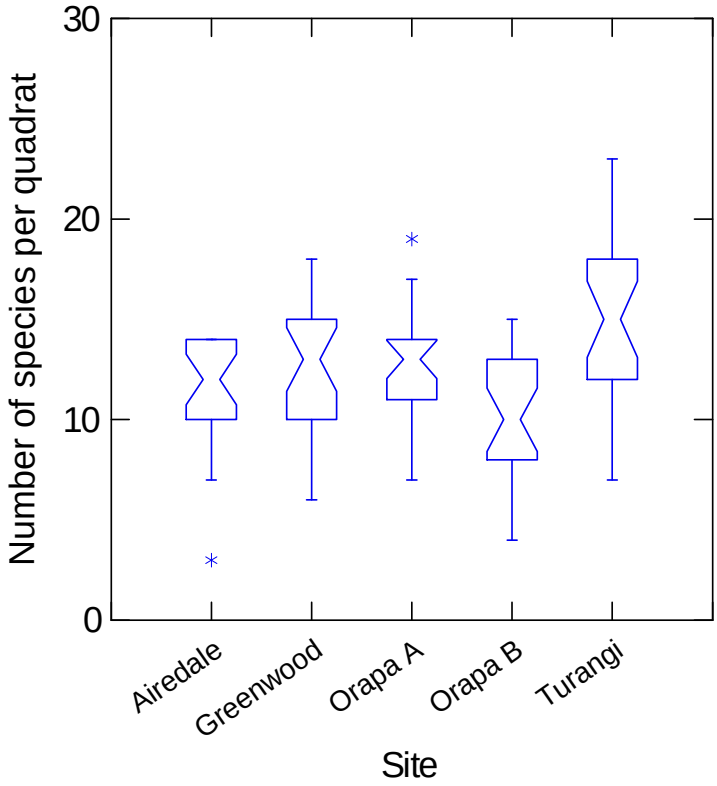


Figure 1A Box and whisker plot of total number of species per quadrat

At the 95% confidence level, there were no significant deviations from a normal distribution at any of the sites (Lilliefors test, n = 25, P > 0.05). There was a significant difference in species number per quadrat between sites (ANOVA, n = 25, F = 7.7, P <0.001).

Table 1A Tukey's multiple comparison test of total number of species per quadrat

Site	Greenwood Rd	Orapa B	Orapa A	Airedale Reef
Orapa B	NS			
Orapa A	NS	NS		
Airedale Reef	NS	NS	NS	
Turangi Reef	SIG	SIG	SIG	SIG

Key - SIG = significant difference at 95% confidence level
NS = no significant difference at 95% confidence level

Significant differences between sites were determined using Tukey's multiple comparison test (Table 1A). At Turangi Reef the mean number of species per quadrat was significantly higher than that at all other sites (P <0.05).

2011: Shannon-Weiner Diversity Index

Figure 2A shows the Shannon-Weiner index per quadrat at each site as a box and whisker plot.

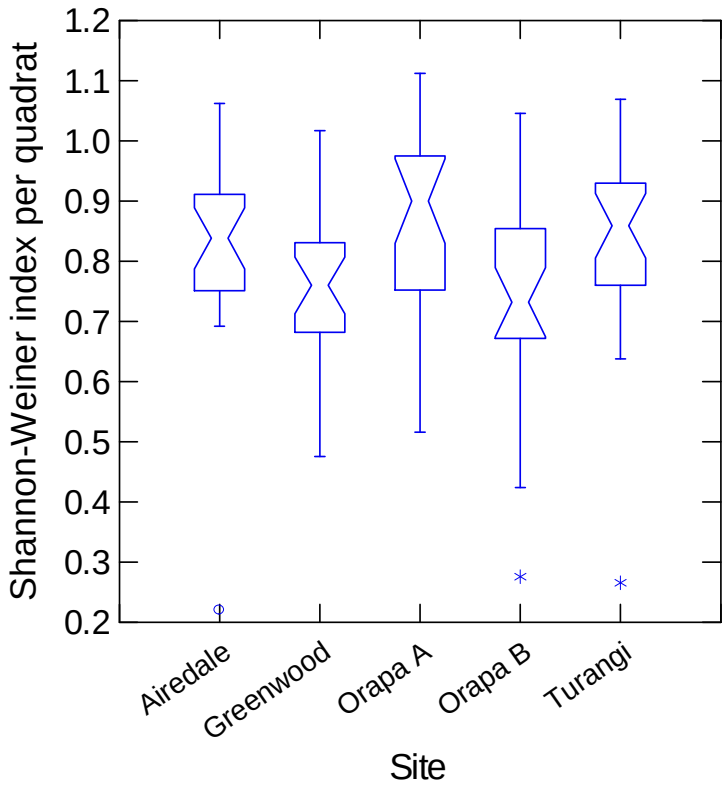


Figure 2A Box and whisker plots of mean Shannon-Weiner index per quadrat

At the 95% confidence level, there was a significant deviation from a normal distribution at Airedale only (Lilliefors test, n = 25, P = 0.031). There was a significant difference in the Shannon-Weiner index per quadrat between sites (ANOVA, n = 25, F = 3.3, P = 0.013). Significant differences between sites were determined using Tukey's multiple comparison test (Table 2A). At Orapa A the mean Shannon-Weiner index per quadrat was significantly higher than that at Orapa B (P <0.05).

Table 2A Tukey's multiple comparison test of Shannon Weiner Index per quadrat

Site	Greenwood Rd	Orapa B	Orapa A	Airedale Reef
Orapa B	NS			
Orapa A	NS	SIG		
Airedale Reef	NS	NS	NS	
Turangi Reef	NS	NS	NS	NS

Key - SIG = significant difference at 95% confidence level
NS = no significant difference at 95% confidence level

2012: Number of species per quadrat

Figure 3A shows the total number of species per quadrat at each site as a box and whisker plot.

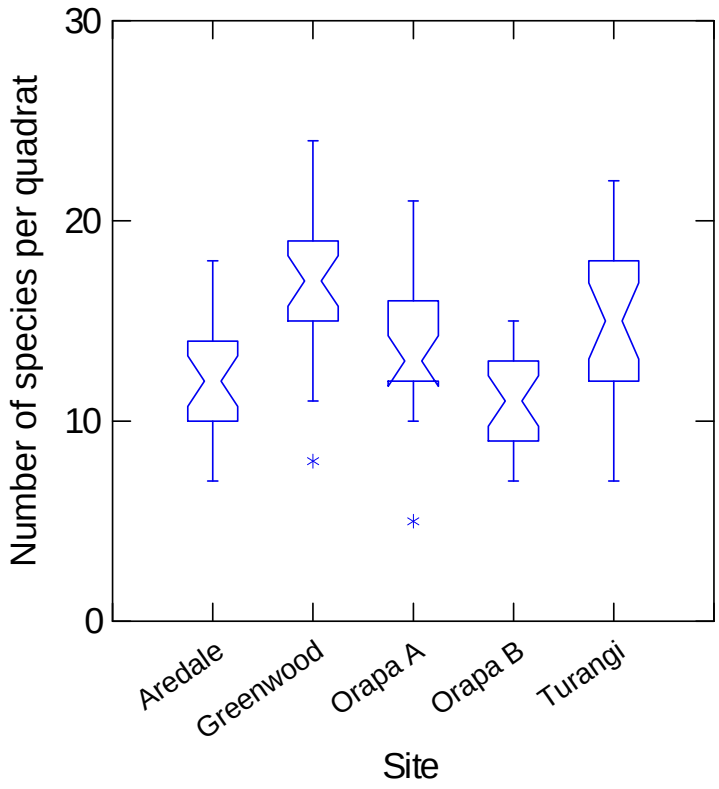


Figure 3A Box and whisker plot of total number of species per quadrat

At the 95% confidence level, there were no significant deviations from a normal distribution at any of the sites (Lilliefors test, n = 25, P > 0.05). There was a significant difference in species number per quadrat between sites (ANOVA, n = 25, F = 11.5, P <0.001).

Table 3A Tukey's multiple comparison test of total number of species per quadrat

Site	Greenwood Rd	Orapa B	Orapa A	Airedale Reef
Orapa B	SIG			
Orapa A	SIG	NS		
Airedale Reef	SIG	NS	NS	
Turangi Reef	NS	SIG	NS	SIG

Key - SIG = significant difference at 95% confidence level
NS = no significant difference at 95% confidence level

Significant differences between sites were determined using Tukey's multiple comparison test (Table 3A). At Greenwood Road the mean number of species per quadrat was significantly higher than that at all other sites (P <0.05) with the exception of Turangi Reef (P = 0.371). There was no significant differences in mean number of species per quadrat between all potential impact sites (P >0.05).

2012: Shannon-Weiner Diversity Index

Figure 4A shows the Shannon-Weiner index per quadrat at each site as a box and whisker plot.

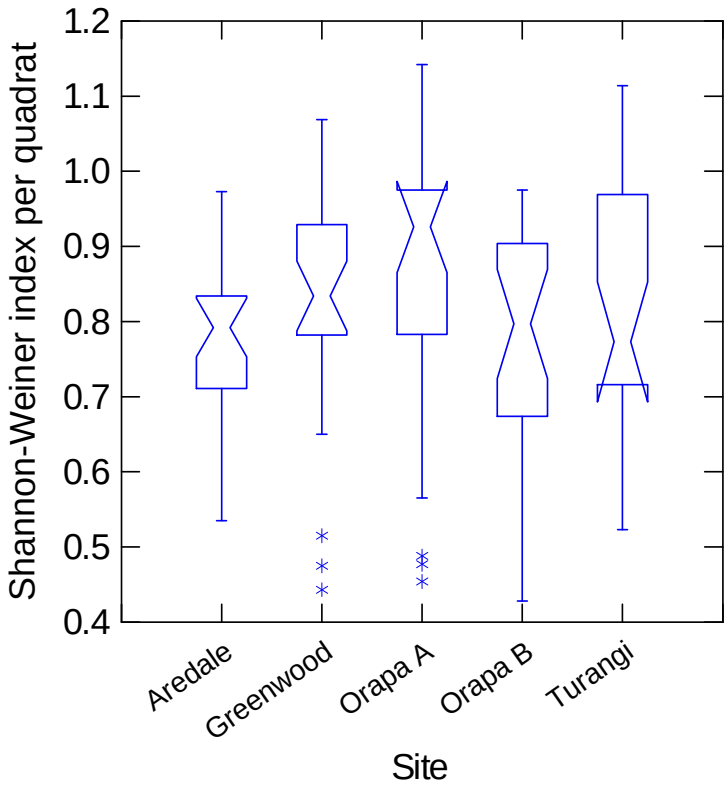


Figure 4A Box and whisker plots of mean Shannon-Weiner index per quadrat

There was a significant deviation from normal distribution at the following sites: Orapa A and Greenwood Road (Lilliefors test, n = 25, P <0.05). There was no significant difference in the Shannon-Weiner index per quadrat between sites (ANOVA, n = 25, F = 1.4, P = 0.253).

Appendix IV

NPDC Waitara Municipal Wastewater Discharge Annual Reports:

1) TRK 89/3397 January 2011 to June 2012
2) 3397-2 July 2012 to June 2013

NEW PLYMOUTH DISTRICT COUNCIL
newplymouthnz.com

WAITARA MUNICIPAL WASTEWATER DISCHARGE CONSENT TRK 89/3397

ANNUAL REPORT

1 January 2011 to 30 June 2012

CONTENTS

Prepared by:
David Nepia
WASTEWATER TREATMENT PLANT SUPERINTENDENT
Graeme Pool
MANAGER OPERATIONS WATER & WASTES

File: WW 08 04 20 06

1. INTRODUCTION

This report is submitted to satisfy condition 14 of Discharge Consent TRK 89/3397.

2. RETICULATION

Work towards addressing and removing illegal connections has continued in 2011.

Further works are underway to determine how best to achieve significant reduction in inflow and infiltration with available budgets.

3. PUMP STATIONS

3.1. Sewage Discharges Directly to Environment

There were a number of overflows from pump stations in Waitara and including Waitara WWTP during 2011. There are a total of 4.73million operating minutes during 2011 across all 9 pump stations. The total minutes of overflow recorded during 2011 was 5007, of which 3460minutes of overflow took place at the end of December as a result of 124mm of rain falling on 30 & 31 December. The total minutes of overflow represents approx 0.1% of the total operating time.

In the period from 1 January 2012 to 30 June 2012 the pump station overflows were much reduced compared to the totals for 2011 but similar to the same 6 month time period in 2011. In total the pump station in Waitara overflowed for 285 minutes which represents less than 0.01% of the total operating time.

3.2. Pump Station Maintenance

Routine maintenance was undertaken over the year.

4. WAITARA WASTEWATER TREATMENT PLANT

4.1. General

The year passed without any major problems with plant or buildings. The installed systems are working as designed.

Vandalism still continues to present a challenge.

Generally all of the plant ran well and with the pro-active maintenance scheduling and continued up-skilling of the staff, most problems were quickly rectified.

4.2. Milliscreens

Checking and cleaning of these screens has been done and no problems were found during maintenance checks. Still significantly more solids are being removed since ANZCO began to discharge to the plant.

4.3. Lime Dosing

Routine maintenance was completed on the lime pumps. Overall, the lime dosing system has run well.

4.4. **Effluent Retention Tanks**

Quadrant level detectors and transmitters were replaced along with quadrant mixer removal for maintenance.

4.5. Non-Complying Discharges

A number of factors have contributed to the poor performance in this area. The ANZCO discharge which can swing widely in pH continues to present considerable challenges to process operations.

Technicians use a graph relating pH target, flow to plant and lime dosing rate to achieve better control over the plant discharges. ANZCO discharges strength of waste has meant the established relationships are not always applicable. Technicians have been coordinating with our tradewaste officer in reviewing discharges and its link to our operations and control.

Variable weather conditions make it difficult to predict where to set up operations for the best level of control. Technicians use weather forecasting to predict the lime dose, for example reducing the lime dose set point if heavy rain is forecast. The weather forecasts have not always eventuated resulting sometimes in quadrants being under-dosed.

1.0 pH unit swings between successive discharges meant lime dosing needed to be run close to the upper limit to ensure faecal coliform kill. The source of the pH swings is believed to be tradewaste discharges as indicated above. This has meant dose rates were often just above the 11.5 pH upper limit.

Technicians continue to focus on pH control. This has resulted in more successful intervention to achieve target dose ranges.

4.6. **Waitara WWTP % Discharges within limits (Target Max pH = 11.5)**
The council's goal is to be better than 95% compliant in all months.

During this year New Plymouth District Council introduced a new data storage and analytical tool called Water Outlook. As a result of the additional information captured and the ability to easily extract and manipulate the data the monthly reports were amended to demonstrate compliance with resource consent on a smaller time interval during each discharge rather than based on a average value per discharge. The amended reporting has been issued to TRC monthly throughout the year.

During 2011 1424mm of rainfall was recorded. On the wettest day 92mm or rain was recorded which led to 15 discharges. A total volume of 1,245,303m3 of effluent was discharged. The volume discharged per day fell within the resource consent conditions. The average daily discharge was 3,412m3 with a maximum volume discharged of 9455m3 and a minimum of 1286m3

Waitara WWTP discharged to the environment via the outfall pipe on 1474 discrete occasions and for a total of 141,750 minutes During 2011 the discharge exceed the upper consent limit for pH for 16% of this time (22,690 minutes). At no time did the discharge fall below the minimum pH discharge consent condition

Effluent grab samples were tested regularly. The consent compliance requires a maximum of 50000faecal coliforms per 100ml. During 2011 the results gave a maximum count of 5450 faecal coliforms per 100ml and an average count of 203.

A new discharge consent was granted on 13 December 2011. The consent raised the upper pH limit from 11.5 to 12. The total daily flow limit was also increased from 11664m3 to 11950m3

In the period to 30 June 582mm of rainfall was recorded. On the wettest day 99mm or rain was recorded which led to 11 discharges. A total volume of 555,697m3 of effluent was discharged. The volume discharged per day fell within the resource consent conditions. The average daily discharge was 3,250m3 with a maximum volume discharged of 11581m3 and a minimum of 1901m3

In this period, Waitara WWTP discharged to the environment via the outfall pipe on 617 discrete occasions and for a total of 60,010 minutes. The discharge exceed the upper consent limit for pH for <1% of this time (230 minutes). At no time did the discharge fall below the minimum pH discharge consent condition (numbers correct up to 18 June 2012)

Effluent grab samples were tested regularly. The consent compliance requires a maximum of 50000faecal coliforms per 100ml. During 2011 the results gave a maximum count of 200 faecal coliforms per 100ml and an average count of 42.

WAITARA OUTFALL

4.7. Outfall Pump Station

The pump station is working well and only routine maintenance work was required to be undertaken.

4.8. Outfall Pipeline

A number of dives were undertaken between January 2011 and June 2012 by OCEL. Further inspection work was undertaken along with remedial works to a number of outfall anchorages. Further work is required to complete the defects identified in previous inspections but the dive conditions have prevented the work from being completed. Further dives are planned subject to sea conditions. The outfall remains fit for purpose.

Te Kaunihera-ā-Rohe o Ngāmotu
NEW PLYMOUTH DISTRICT COUNCIL
newplymouthnz.com

WAITARA MUNICIPAL WASTEWATER

DISCHARGE CONSENT

3397-2

ANNUAL REPORT

1 July 2012 to 30 June 2013

Prepared by: Graeme Pool
MANAGER OPERATIONS WATER & WASTES

Date: 31 July 2013
Version: One
Document: 1450556
File: WW 08 04 20 06

1 INTRODUCTION

Coastal Permit Consent 3397-2 commenced on 13 December 2011. This consent permits the discharge of up to 11,950m^3 of treated wastewater from the Waitara Wastewater Treatment Plant into the Tasman Sea via the Waitara Marine Outfall. The consent contains 16 special conditions.

This report is submitted to satisfy condition 8 of Consent 3397-2 which requires an annual report to be submitted detailing as a minimum:

a) Plant maintenance and an overview of plant performance

b) Pump station maintenance and overview the outfall and pump station performance

c) Details of any overflows and / or system failures resulting in untreated or partially treated discharges

d) Details of any complaints in accordance with condition 13

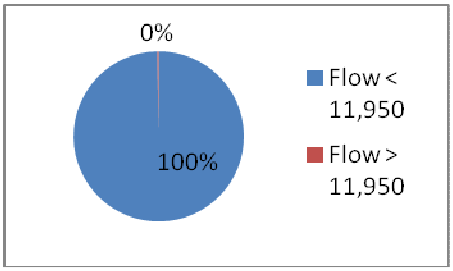
In addition to the above minimum information this report also includes performance data in relation to the other special conditions.

2 COMPLIANCE WITH SPECIAL CONDITIONS

2.1 Special condition 1

Special condition requires that the volume of discharge measured over a 24 hour period shall not exceed 11,950m^3 and the rate of discharge shall not exceed 138l/s.

This condition has been complied with during the year. Daily data has been provided with the monthly reports submitted to TRC. The highest daily discharge recorded was 11664m^3 which was recorded on occurred on 2nd and 3rd February. This data is incorrect and resulted as a loss of telemetry data. The next highest value was 11577m^3 recorded on 11 June 2013. The average daily discharge was 3700m^3



2.2 Special condition 2

Stipulates that the discharge authorised by the consent 3397-2 be ceased as soon as practicable after the Waitara to New Plymouth pipeline is commissioned.

The construction of the pipeline is nearing completion with the pipeline laid from Waitara to New Plymouth. The New Plymouth end of the pipeline has been connected

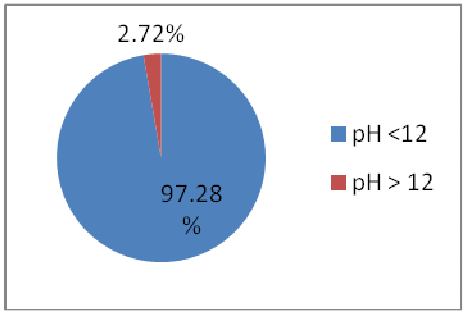
into the Wastewater treatment plant. Testing of the pipeline is in progress. Detailed design of the conversion works at Waitara WWTP are being finalised and documents are being prepared in readiness to call tenders.

2.3 Special condition 3

Special condition 3 relates to the pH of discharges from Waitara WWTP and requires that at least 98% of discharges fall within the range pH6 to pH12.

This appears to be a generous range for compliance however it should be recognised that in order to achieve disinfection the lower target from an operational perspective is around pH10.8.

Detailed daily reports for compliance have been provided within the monthly reports supplied to TRC. Of a total 134,840 minutes discharging, the pH exceeded 12 for 3670 minutes. 1040 minutes occurred between 9th and 11th September as a result of failure of the Waitara Outfall pump station. This resulted in treated effluent overflowing into the sewer reticulation at pump stations and the treated effluent being recirculated for further treatment.



2.4 Special condition 4

Special condition 4 stipulates the maximum concentrations of Suspended Solids Chemical Oxygen Demand, Oil and Grease, and Ammonical Nitrogen. These criteria are sampled on the basis of a 24 hour flow proportion composite sample.

Constituent	units	Concentration not greater than:	Sample location	Number of samples taken	% compliance
Suspended Solids	g/m³	1000	EFFLUENT	34	100%
Chemical Oxygen Demand	g/m³	800	Influent	8	100%
Oil and Grease	g/m³	200	Influent	8	100%
Ammoniacal Nitrogen	g/m³	50	Influent	8	100%

2.5 Special condition 5

On the basis of grab samples the concentration of faecal coliforms in the discharge shall not exceed 50,000 per 100 millilitres

Constituent	units	Concentration not greater than:	Sample location	Number of samples taken	% compliance
Faecal Coliforms	No/100ml	50,000	EFFLUENT	34	100%

2.6 Special condition 6

Beyond a 200m mixing zone in the Tasman Sea, the discharge shall not give rise to

a) conspicuous oil, grease, scum, foam, or suspended solids

b) Conspicuous change in colour or clarity

c) Emission of any objectionable odour

d) Any significant effects on aquatic life

NPDC have not observed or been made aware of any of these conditions being observed. TRC undertake routine sampling to determine any effects on aquatic life. No information has been passed to NPDC to suggest that any effects have been noted.

2.7 Special condition 7

This consent condition requires that monthly reports are submitted in electronic format to TRC to demonstrate compliance.

Monthly reports have been provided as required under this consent condition. The monthly reports have included a summary narrative of any key issues during each month and any significant maintenance or plant issues. With effect from July 2013 each electronic monthly report will include additional information which provides summary compliance data for the preceding 12 month period.

2.8 Special condition 8

This condition requires an annual report to be submitted. Additional information specified to be included in the annual report but not addressed separately under any other special condition is provided below.

2.8.1 Pump Stations

City Care assumed responsibility, overseen by NPDC, for routine operation of the minor pump stations with NPDC staff continuing to assume responsibility for operation of Waitara WWTP and Waitara Outfall Pump Station. Routine maintenance was undertaken over the year by City Care Limited under a new contract. A number of issues were identified at pump stations by City Care which resulted in refurbishment of a number of pumps; mostly at? Richmond St. Working with Xylem to attempt to address frequent blocking of pumps at McNaughton St a trial installation of a chopping impellor was intended. However on returning the pumps to Xylem for fitting of the new impellor it was identified that the existing pumps were in a poor state of repair. An alternative set of pumps with improved hydraulics, solids handling and blocking resistance were ordered and delivered late in June. These will be installed during July 2013.

NPDC I & E team also assisted in the optimisation of control for McNaughton St and Queen St pump stations with a view to reducing the likelihood of screens overwashes by improving pump control to deliver a more uniform flow to the WWTP.

2.8.2 Waitara Wastewater Treatment Plant

Routine maintenance has been undertaken as required during the year. The extent of maintenance undertaken has taken into account that a large proportion of the equipment will become redundant once the treatment plant is converted to a pumping station.

For the most part, repairs have been made rather than purchasing new equipment. Two quadrants are unserviceable due to seized outlet valves. This has been the case for two years however it is not possible to free these valves without removing four quadrants from service. Mixers have been taken from these out of service quadrants to replace failed mixers in otherwise usable quadrants.

Lime Dosing has generally been problem free until June 2013. Initially the bottom steady bearing in one lime tank failed and caused excessive vibration of the mixer shaft which then became distorted. The lime tank was emptied to allow the bottom bearing to be replaced including shortening of the shaft and raising the bottom bearing to allow the distortion to be cut out. While this work was in progress it is suspected that a contaminated load of lime was received into the remaining lime tank. The contamination included hard chips of stone which damaged both lime dosing pumps. Operators responded to the failed pumps before identifying that the issue was within the lime slurry. As a result a number of discharges were made without adequate lime dosing. To reduce the risk of future problems it is planned to replace the remaining bottom steady bearings in the second lime tank and to fully clean out the tank of any residual stone chips. McDonalds Lime denies that the contamination could have arisen in their manufacturing or transport process. The lime delivery and dosing system at Waitara is a closed system with nowhere that stone chip could be inadvertently introduced.

2.8.3 Waitara Outfall Pumping Station

During 2012 issues became apparent with the variable speed drives for outfall pump no 2. A replacement drive was ordered and installed but there was a compatibility issue with the old electrical control equipment and the new drive. After a lengthy period of time attempting to configure the new drive it became apparent that the most effective solution would be to replace the two remaining variable speed drives and the PLC and to rewrite the PLC programme. These control issues contributed to the overflow event of September 2012 where Pump 1 failed but the auto control system was unable to skip the out of service pump 2 and revert to Pump 3 as the standby pump. The control system also failed to generate the high level alarms that would otherwise have alerted operations staff to the problem. Work is well underway with re writing and testing the new control programme in the new PLC hardware. The new drives and control will be installed and commissioned by the end of August 2013.

2.8.4 Waitara Outfall

A number of dives were undertaken by OCEL to undertake repair work to the outfall pipeline anchorages. The anchorage repairs are now mostly complete and work will begin next summer on removing tubeworm that has grown on the pipe structure.

2.9 Special condition 9

A Contingency Plan is required. The NPDC Sewer System Emergency Discharge Contingency Plan is to be reviewed and updated in consultation with TRC and TDHB.

The Contingency Plan was reviewed and submitted for approval within the three months of the commencement of this consent as required. During the 2012/13 year, the contingency plan was incorporated into the Incident Response Plan to reduce duplication of documents. Work was undertaken with TDHB to review the locations of signs to advise the public in the event of a discharge of partially or untreated sewage. The annual review is currently underway to incorporate additional feedback received from TRC to include more information in respect of pump models installed at each pump station and to complete other missing information.

2.10 Special condition 10

This condition relates to providing reports and advising programmes of work in regards to the

a) reduction of Inflow and Infiltration to a level whereby the Waitara to New Plymouth sewer will meet the design specification in achieving a level of overflow frequency discharge frequency of <1% per year averaged over a five year period.

b) Progress on the above

c) details staging and timeline for constructing and commissioning of the Waitara to New Plymouth pipeline

d) process on the above

Pump Station Overflows

The level of reporting of overflows to TRC by NPDC has been raised with all recorded overflows being reported. This includes instances where an overflow may have occurred for very short periods of time or not at all (i.e. if the alarm is activated during routine maintenance). An instantaneous operation of the overflow alarm float generates a period of overflow of 3 minutes due to logging of telemetry data. Overflows have been reported which have lasted for only 3 minutes, many of which have not resulted in overflows as they have occurred during maintenance.

There are 11 monitored overflow points on pump stations or at Waitara WWTP.

During the 2012/13 period there were overflows on 28 days out of a total of 4015[1] days. This represents an overflow on 0.7% of the days.

The total time that overflows have occurred is 6025 minutes out of 5,781,600[2]. This represents 0.1% of the time.

A significant proportion of the total overflow time is attributed to a single event during September 2012 when a total overflow time of 4226 minutes was recorded between Waitara Outfall, Queen St, McNaughton St and Battiscombe Terrace. While

[1] The total number of pumping days is 11x365 = 4015days

[2] The total number of pumping minutes during the year is 11x365x24x60 = 5,781,600

the overflow was a result of failure of the outfall pumps extended over a weekend, the discharge continued to be treated at a gradually increasing pH due to recirculation of the treated effluent back to the treatment plant.

Inflow and Infiltration reduction

Work towards identifying sources of infiltration continued in 2012/13. Investigations had identified that Catchment 4 as defined in the GHD I & I analysis was in fact smaller than had been assumed. This meant that the rates of Infiltration were therefore higher than the analysis suggested. A sum of $185,000 was spent lining pipes in this catchment with a view to reducing infiltration.

A means of identifying and measuring inflow and infiltration was developed based on the Waster Services Association Australia recently published Guidelines for Managing Inflow and Infiltration. The KPI's enable comparison between different catchments to focus work in the areas of most need. Unfortunately NPDC does not have flow meters installed at every pump station, however through level measuring instruments and pump running times it is possible to determine flow and to generate dry weather flow profiles and instantaneous flow profiles from which the KPI's can be calculated. Summer 2012/13 proved to be extremely dry and offered an opportunity to assess the dry weather flow with a greater degree of certainty. This new baseline is now incorporated into the KPI calculations.

Comparison of the KPI values were sent to Emily Roberts with the April monthly report which indicated that there had been a reduction in Inflow and Infiltration between Mar 2012 and April 2013. The KPI's compared two weeks of similar rainfall being approx 80-90mm.

In the case of McNaughton St the KPI values of peaking factor, percentage ingress, and leakage severity were similar and well below trigger values set in the WSAA guidelines. For Queen St the peaking value, percentage ingress and leakage severity showed a marked reduction for percentage ingress (29% down to 6%) and leakage severity (42 down to 11 m^3/m pipe / m wetness). The lower values fall within the values considered acceptable under the WSAA guidelines. Further analysis of KPI's following the rainfall of 17 – 19 June 2013 is to be completed as part of the follow up investigation for overflows at this time. Detailed analysis is dependent upon obtaining detailed rainfall information for this and other events during June.

Many of the minor pump stations in Waitara are old and do not have PLC control with ultrasonic level instruments measuring wet well level. Without these control and measuring devices the KPI calculations cannot be completed. However the age of the panels is such that an upgrade is justifiable and a programme of works is being assembled to replace the old outdated control panels. A period of time will need to be allowed to determine the dry weather flow profile once the panel is replaced. Meanwhile work continues with analysis of the pump stations which can be analysed. I & I at Battiscombe Terrace and East Quay is considered of little significance. However during the rain event of 17 – 19 June 13 the KPI's showed that there is a significant inflow at Queen St and McNaughton St. Further investigation is ongoing.

2.10.1 Waitara to New Plymouth Project update

The Gravity Main and Rising Main sections of the Waitara to New Plymouth pipeline are both now completed. A complete pressure test of the rising main section from the

Waitara WWTP to the back of the Links Subdivision is now required to confirm that a number of untested joints have been installed properly.

The conversion of the Waitara WWTP over to a transfer pump station is currently programmed to be completed by the end of June 2014. A new extension to the existing Waitara WWTP building is to be completed before Christmas 2013. The building extension is to house the new control cabinets and switchboards and will save I&E cost and time during construction

2.11 Special condition 11

This condition requires that notice be given to TRC of any new Trade waste consents issued or modification of existing trade waste consents for which may require additional consent conditions to be applied. Such consent condition variation would be under the review provided for in Special Condition 16

No new Trade Waste Consents have been granted and no modifications have been made to existing Consents

2.12 Special condition 12

This condition requires that signs be placed and maintained in specified locations.

The wording for the signs was agreed with TDHB and signs have been erected and maintained at Waitara West Beach and Waitara East Beach. The Council maintains a register of these signs, and periodically inspects sign locations to confirm that signs remain in place. Replacements are organised if required.

2.13 Special condition 13

A record of complaints received is to be kept. Any complaints relating to the exercise of the consent are to be notified to TRC as soon as practicable

A record of enquiries received by NPDC is maintained.

14 enquires were received from customers located in the Waitara township which were recorded as related to sewer, wastewater treatment or miscellaneous.

Of these most related to issues with sewer reticulation and sewer blockage. Where appropriate City Care was assigned to attend to unblock council mains. Blockages of laterals are considered to be private drainage issues.

Three enquiries were related to missing manhole covers.

One enquiry was received regarding noise from Waitara WWTP which alerted operators to the failed lime mixer bottom steady bearing.

One enquiry was received on 27 June 2013 which relates more directly to the exercise of the consent. The customer noted that signs were present adjacent to Waitara Beach. The complainant wrote

“Hello my name is xxxxxxx. I am 9 years old I saw a few of your signs down at Waitara beach.

It is disgusting to see you are putting untreated sewage into the sea why are we spending time and money on not so important things such as walk ways,bridges . when we should be cleaning up our

mess. People like to fish in our sea but not if you are going to be putting sewage out to sea. Saying that please don't eat shellfish,and other creatures. Then saying they could die from this crap.I would like something done about this not tomorrow not next week not when ever I want it done today. Really not good "

A response was provided acknowledging the comments and explaining that NPDC take this matter seriously. The response also identified that NPDC is currently spending approximately $33M on upgrades to the NPWWTP and converting Waitara to a pumping station.

Further details can be provided on request.

2.14 Special condition 14

An annual meeting with representatives of TRC Otaraua, Manukorihi, Ngati Rahiri and other interested submitters shall be held.

This meeting was held on 6 December 2012. The invite for the meeting was extended to interested parties (including those specified in consents) for both New Plymouth and Waitara wastewater treatment plant consents. An update on the Waitara to New Plymouth pipeline and NPWWTP upgrade works was provided along with a summary of the monitoring undertaken in relation to all consents.

2.15 Special condition 15

This special condition refers to virus monitoring which is to be undertaken as soon as possible after the commissioning of the Waitara to New Plymouth pipeline.

The Waitara to New Plymouth Pipeline has not been commissioned and the virus monitoring required under this condition is not yet required.

2.16 Special condition 16

Special Condition 16 provides for review of this consent on serving of one month notice by TRC or within one month of TRC receiving notice of trade waste changes under Condition 11.

No notice has been received and no new trade waste consents have been granted or amended which have required a review of the consent to be undertaken

Appendix V

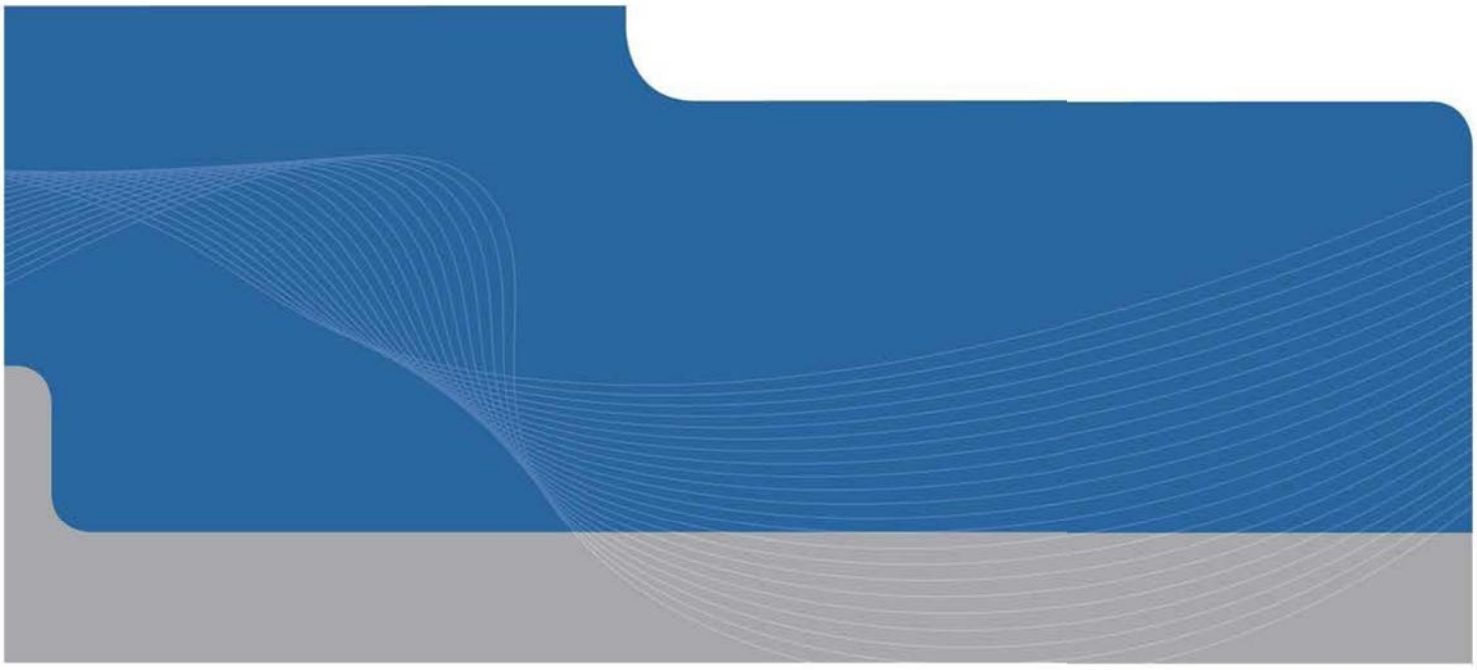
NPDC Waitara Inflow and Infiltration Report June 2012

CLIENTS | PEOPLE | PERFORMANCE

New Plymouth District Council

Inflow and Infiltration Reduction - Waitara

June 2012



INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

Contents

1. Executive Summary

The Resource Consents No. 3397-2 and 7861-1 held by New Plymouth District Council (NPDC) and issued by Taranaki Regional Council (TRC) for the Waitara Marine Outfall discharge requires NPDC to manage discharges through the Waitara Marine Outfall by putting in place and also reporting on a programme to reduce the amount of Inflow and Infiltration (I/I) collected for treatment in the sewerage network in Waitara.

NPDC has undertaken a considerable amount of work on Waitara's sewers, and a management programme is now in place to focus specifically on reducing Inflow and Infiltration.

This Report responds to the requirements of Condition 10 of Resource Consent No.3397-2 and Condition 5 of 7861-1 by reporting on the status of the required I/I reduction works by December 15 and June 30 each year respectively.

Relevant work completed includes the following -

- Construction of a calibrated hydraulic model of the system that will enable determination of the effect I/I reduction works will have on the reduction of system overflows.
- A detailed I/I analysis of flow data obtained from the flow monitoring programme implemented in the above-mentioned modelling process that has identified the parts of the system reticulation that have the greatest levels of I/I.
- Some initial physical investigations to identify and rectify sources of direct inflow in the identified worst areas of the system.
- Repair/replacement of damaged sewers considered to causing downstream overflows in the system.
- Works currently being scoped for immediate implementation are in accordance with recently published good practice industry guidelines for management of wastewater system inflow and infiltration and are as follows -
    - Further physical inspections in the previously identified worst areas in the catchment.
    - Replacement or rehabilitation of public sewers, house laterals and manholes in the areas identified as having the worst I/I as part of the already budgeted wastewater system renewals over the next five years.

The initial cost estimates produced indicate a cost of approximately $0.8M in Year One of the programme and an indicative cost of $0.25M in Years Two to Five.

2. Introduction

2.1 History

Sewage generated by the households and industries in Waitara has been collected and disposed of for many decades. For many years, this sewage was disposed of after rudimentary treatment into the Waitara River and the Tasman Sea. Due to the offensiveness of this to local hapu, a historic Waitangi Tribunal claim was made, the outcome of which confirmed the hereditary right of the hapu to their kai-moana gathering from the Waitara Reef. As a result of this, and the petro-chemical developments in the Waitara Valley and Motunui in the early 1980's a treatment system and a long sea outfall was constructed to treat and dispose of Waitara's domestic and industrial sewage.

However community and hapu concerns remained about the discharge of human waste through the outfall into the sea and the NPDC determined to transfer the sewage to New Plymouth for treatment and disposal. This proposal was advanced by NPDC following strong representations from the groups mentioned above.

2.2 Inflow and Infiltration (I/I)

Inflow and infiltration are the technical terms used to describe the components of rainfall derived flows in sewerage networks. Inflow is the entrance of surface water and infiltration the entrance of groundwater into sewer pipes.

Roof and household drains are sources of surface water inflow and groundwater can seep through defective pipe joints, cracked pipe sections and manholes.

A relevant process for the identification and control of I/I is outlined in the Water Services of Australia (WSAA) publication 'Management of Wastewater System Inflow and Infiltration Good Practice Guideline Document', published in November 2011. This document has reference to I/I activities in New Zealand, most notably in Hillsborough (Auckland) and Palmerston North.

2.3 Domestic sewage volumes

The volume of sewage generated by the properties in Waitara serviced by the Waitara Borough Council, and its successor, the New Plymouth District Council, has long been recognised as being severely impacted by rainfall events and groundwater conditions in Waitara. The priority for Council until recently has been the need to meet minimum levels of service for its wastewater system, and this has been the driver behind capital and renewal expenditure. However the volume of flows has become an increasing priority in recent years to ensure that the Waitara WWTP and the proposed pipeline to New Plymouth can be operated as efficiently as possible.

Exacerbating factors in Waitara which contribute to these high flows are the low lying nature of the ground in many parts of Waitara relative to river levels which results in a high groundwater table, the alluvial nature of the soils, and the relatively recent installation of stormwater systems in Waitara, which means that the sewer system acted as a de facto drain to dispose of excess runoff.

The location of many sewers in Waitara on private property is also an issue. These sewers are less expensive to install but present long term access and maintenance issues. In these locations their

usefulness to drain excess water from private property often leads to inflow that is both difficult to detect and to distinguish between flows from public and private drains.

A flow monitoring programme was undertaken by NPDC in 2004 and subsequently a GHD report entitled 'Waitara Wastewater System Inflow & Infiltration' was provided to the NPDC in December 2004.

2.4 Current Resource Consents

The engineering assessments undertaken by NPDC as part of NPDC's decision making process to divert Waitara's sewage to New Plymouth concluded that the most efficient design for a pipeline to New Plymouth (considering operational efficiency and minimising the potential for overflows as much as possible) would be to pump all of Waitara's sewage to New Plymouth, except for periods of extreme high flows (less than 1% of the time). As a result, NPDC applied for resource consents to continue using the Waitara outfall during the construction of the pipeline, and following its commissioning, only during periods of extreme high flows.

Two consents were granted on 15 December 2011 relating to Waitara. Consent 3397-2, which allows treated wastewater to be discharged from the Waitara Marine Outfall during the construction of the pipeline expires on 1 June 2017. Consent 7861-1 allows the discharge of screened untreated municipal wastewater via the outfall during high flow events. This consent expires on 1 June 2041.

Condition 10 of Consent 3372-2 and Condition 5 of Consent 7861-1 require NPDC to provide details of a programme of works for reducing Inflow and Infiltration to an overflow frequency discharge of 1% per year, averaged over a five year period, and to report annually on progress in December and June respectively.

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3. Completed Works

3.1 Background

NPDC have funded investments in Waitara over the last 15 years or so, both to raise infrastructural levels of service so that these are consistently delivered across the District, and to replace aging or failing infrastructure. Some of these works will have had a positive impact upon sewage flows over the years. These are described below.

3.2 Stormwater Works

The first driver for stormwater works in Waitara was to provide adequate drainage to the concentrations of flow from rainfall runoff brought about by the long term programme undertaken by NPDC to provide kerb and channel and footpaths to those areas within Waitara that were without these facilities. These systems also had to take into account localised flooding and ponding issues.

Secondly, systems were constructed to improve drainage to low lying and wet areas that stormwater modelling had indicated that buildings were at risk from inundation in the 1% AEP (100 year return) rainfall event. Stormwater works for at risk residential areas continue to be installed.

Thirdly systems that had been identified as being at risk of failure (following a major maintenance event or blockage) were replaced.

As a general rule these stormwater systems were installed at lower levels than adjacent sewers, and field tiles placed in the bottom of the trenches so that groundwater could be directed into the stormwater systems rather than seeping into the sewer system.

3.3 Sewerage Works

NPDC was also active in trying to identify and understand any issues associated with the sewer network in Waitara. One of the first actions NPDC undertook in the 1990's was to undertake a closed circuit television (CCTV) of the sewers to determine what condition the sewers were in. Analysis of complaints records also lead to network improvements. It must be noted that the NPDC's focus at this time was on the condition and performance on the network, and not on reducing inflow and infiltration. Works have focused on rehabilitating and repairing those parts of the network that the CCTV inspection had revealed as requiring these works to be undertaken. Larger sewers were also installed in some locations to minimise overflows.

These works has meant that Council has met its KPI's for the levels of service delivered by the sewerage network.

Following the 2004 report, an in-depth CCTV and individual property inspections in the WT12 catchment (which is located in Waitara West and is approximately bounded by the Waitara River, McNaughten, Browne and Stafford Streets) was carried out in 2006. As a result of this a series of private works and rehabilitation works on the public mains was commissioned and has been largely completed. Further CCTV work is underway.

Following this, in 2009, a smoke testing programme to identify properties with stormwater discharges into the sewerage network was carried out. An estimated 130 properties with issues were identified and repairs undertaken.

NPDC has undertaken considerable analysis of pump station flow records in Waitara to determine dry weather sewage flows, to ascertain the levels of I/I in the areas serviced by those pump stations. This analysis also enables the elements of the I/I in these areas to be determined.

A computer model of the sewer network in Waitara has been developed. This is a key element of any I/I management programme.

In addition NPDC has updated their pipe condition assessment of Waitara's sewers. Of particular note is that many of the manholes, while being structurally sound, are not sealed and if located in an area of high groundwater, are a source of infiltration. Actions undertaken to fix the worst of these have experienced mixed success due to the difficulty of sealing manholes completely during the repair phase.

As part of the development of this report, a workshop was carried out at which NPDC staff members have contributed freely of their actions to date and their learning from these. This has shaped the nature of this report and the proposed programme below to a large degree.

4. Inflow & Infiltration Management Programme

4.1 Elements of a management programme

The WSAA Management of Wastewater System Inflow and Infiltration Good Practice Guideline Document sets out good practice I/I reduction methodology. This involves 5 steps, described as follows;

- Pre-rehabilitation flow monitoring & I/I analysis.
- I/I source detection programme.
- Rehabilitation design and implementation.
- Post rehabilitation flow monitoring and flow analysis.
- I/I reduction effectiveness measurement.

The Guideline Document also outlines how cost effectiveness, house lateral I/I, and I/I reduction predictions can be assessed.

It is noted that at Waitara, NPDC has undertaken most of the first two step of a successful I/I management programme. The key actions that need to be developed are the measurement and feedback elements that are required to direct efforts over a period of time to meet the requirements of the resource consent.

4.2 Developing a programme for Waitara

The further development of an I/I management programme for Waitara needs to be considered in the context of both the resource consents and the work undertaken to date. Some of the steps outlined above will need to be updated and undertaken concurrently so that the likely cost and outcome of the I/I programme developed can be reported as required in the conditions of the consents.

It is considered that sufficient work has been undertaken by NPDC to commence the implementation of the rehabilitation phase. This should be carried out in conjunction with a flow monitoring programme, the outputs of which will be to update the I/I analysis and source detection work undertaken to date as well as measure the effectiveness of the rehabilitation work.

Following the workshop held in May 2012, it was decided to commence the following works;

- WT 4 catchment (the Hume St, Ranfurly St, Cracroft St and Tauranga Pl areas of Waitara West). Seal and reline all sewer pipes including the lateral/main junctions and house laterals from the sewer main to gully traps. It is also recommended that the sewer main liner be laid through on-line manholes which are less than 120 metres from adjacent manholes. This will have the effect of sealing these manholes. This level of rehabilitation would be expected to reduce I/I in the range of 50% to 75% in this catchment.
- Waitara East. Separate the catchments by diverting flows directly into the Richmond Street pump station. This will have the effect of isolating the worst catchments in Waitara East to make the source detection easier.
- Waitara West. Modifying an existing bifurcation will also save some pumping costs by diverting some of the flow away from the Battiscombe Terrace pump station and will reduce the hydraulic loading on the WT 4A catchment.

- Undertake a flow monitoring programme to update the I/I analysis including calculating the cost effectiveness and reduction predictions to produce a future programme of further works.

Costing for the above programme of works is set out in Section 5 below. It is noted that the estimated costs for Years 2 – 5 are indicative only and are subject to the finalisation of a programme of works that will be defined as a result of actions in Year 1. Any future request for an increased level of funding will be subject to NPDC processes for approval.

These outcomes will be reported to NPDC and the Taranaki Regional Council as part of the normal consent reporting by 30 June 2013.

4.3 Ensuring the Programme achieves its Target Outcomes

The guideline document also takes cognisance of the difficulties in successfully implementing an I/I reduction programme. Common features of successful outcomes are:

- Knowing what is involved. NPDC is aware of this.
- Patience and perseverance. In many situations results are not immediately apparent as over the long term a large number of assets will effectively be replaced.
- Adhering to the process with close liaison with flow monitoring and rehabilitation contractors.
- Being consistent with the approach taken.

Managing the approach rigorously and consistently is the key to NPDC meeting the outcomes required by the conditions of the resource consents.

5. Cost estimates

Planned Waitara I& I programme - Year 1				
Item	**Qty**	**Unit**	**Rate**	**Amount**
Catchment WT4 rehabilitation				
150 mm sewer main relining	630	metre	208.00	$131,040.00
Lateral connection replacement	60	each	1728.01	$103,680.60
100 mm lateral relining	900	metre	260.01	$234,009.00
Waitara East separation	1	lump sum	150000.00	$150,000.00
Supervision and Council staff time	1000	hr	50.00	$50,000.00
Flow monitoring and reporting	1	lump sum	50000.00	$50,000.00
Contingency	1	lump sum	70000.00	$70,000.00
			Total	**$788,729.60**
Indicative Waitara I& I programme – Years 2 - 5				
Catchment rehabilitation				
Large sewer main relining	80	metre	300.00	$24,000.00
150 mm sewer main relining	250	metre	208.00	$52,000.00
Lateral connection replacement	25	each	1728.01	$43,200.25
100 mm lateral relining	400	metre	260.01	$104,004.00
Supervision and NPDC staff time	200	hr	50.00	$10,000.00
Flow monitoring and reporting	1	lump sum	15000.00	$15,000.00
			Total	**$248,204.25**

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Document Status

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