Todd Energy Aquatic Centre Monitoring Programme Annual Report 2016-2017

Technical Report 2017-33

ISSN: 1178-1467 (Online)
Document: 1870270 (Word)
Document: 1900389 (Pdf)

Taranaki Regional Council
Private Bag 713
STRATFORD

August 2017

Executive summary

The New Plymouth District Council (NPDC) operates the Todd Energy Aquatic Centre (Aquatic Centre) located on Tisch Avenue, New Plymouth. This report for the period July 2016 to June 2017 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess NPDC's environmental performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Aquatic Centre's activities.

NPDC holds two resource consents relating to the Aquatic Centre, which include a total of thirteen special conditions that NPDC must satisfy. One consent allows NPDC to discharge swimming pool wastewater into the Tasman Sea, and the other allows it to erect, place, use and maintain a discharge pipe at the site.

During the monitoring period, NPDC demonstrated an overall level of environmental performance that required improvement.

The Council's monitoring programme for the year under review included four site inspections, two marine ecological inspections, a backwash discharge sample, an outdoor pool water sample, and two samples of the receiving waters collected for physicochemical analysis.

An additional wastewater discharge sample was also collected from the marine outfall following the discovery that greywater was being discharged from the women's showers at the Aquatic Centre to the stormwater network, which discharges to the Kawaroa Reef.

The backwash and outdoor pool wastewater discharges that were monitored in the period under review were compliant with consent conditions. Neither of the discharges appeared to have any significant effects on the ecology of the Kawaroa Reef outside of the designated mixing zone, although an increase in the cover of *Ulva* sp. up to 15 m away from the outfall may indicate a potential freshwater impact. A 2.4 m length of pipe was found to have dislodged from the end of the marine outfall during the year under review. Wastewater has consequently been discharging from the outfall in shallower areas, higher up the rocky shore, which may have influenced algal spread in the vicinity of the outfall.

There were two Unauthorised Incidents recording non-compliance in respect of this consent holder during the 2016-2017 monitoring year. An infringement notice was issued for the unauthorised discharge of blue paint to the Kawaroa Reef and an abatement notice was issued requiring works to be undertaken to ensure that no unauthorised discharges occur through the marine outfall.

An improvement in NPDC's environmental performance is required in relation to the exercise of resource consents 2339-4.0 and 4588-3.0.

For reference, in the 2016-2017 year, 74% 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 21% demonstrated a good level of environmental performance and compliance with their consents.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance has deteriorated in the year under review.

This report includes recommendations for the 2017-2018 year.

Table of contents

List of tables

List of figures

List of photos

1. Introduction

1.1. Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1. Introduction

This report is for the period July 2016 to June 2017 by the Taranaki Regional Council (The Council) describing the monitoring programme associated with two resource consents held by the New Plymouth District Council (NPDC) for the Todd Energy Aquatic Centre (Aquatic Centre) on Tisch Avenue, New Plymouth.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents that relate to discharges of pool and filter water into the Tasman Sea and to erect, place, use and maintain an ocean outfall. This is the 17th annual report to be prepared by the Council to cover the Aquatic Centre's water discharges and the associated effects.

1.1.2. Structure of this report

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

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by NPDC for the Aquatic Centre;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Aquatic Centre.

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

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

Section 4 presents recommendations to be implemented in the 2017-2018 monitoring year.

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

1.1.3. The Resource Management Act 1991 and monitoring

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

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;

b. physical effects on the locality, including landscape, amenity and visual effects;

c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;

d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and

e. risks to the neighbourhood or environment.

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

1.1.4. Evaluation of environmental and administrative performance

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

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the NPDC's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretations, are as follows:

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or in response to unauthorised incident reports, but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent

minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and was addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time; however these were addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2016-2017 year, 74% 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 21% demonstrated a good level of environmental performance and compliance with their consents.

1.2. Process description

The Aquatic Centre is sited on the foreshore at Tisch Avenue, New Plymouth. The facility consists of outdoor pools (including a main pool, diving pool and children's pools) and an indoor pool complex (Figure 1).

Discharge of wastewater from the outdoor pool complex filtration system takes place via the original discharge pipe which is situated on the foreshore to the east of the facility (Photo 1) and in the vicinity of an intake for water used in heat exchange by the swimming pool.

The discharge pipe consists of a 300 mm diameter encased concrete pipe and discharges at approximately mid-tide level. This structure was constructed in 1962 and has been in use ever since for the purpose of backwashing the outdoor pool filters.

Photo 1 Aquatic Centre marine outfall

During 1993 a heated indoor aquatic centre was constructed next to the existing outdoor facility. The indoor facility consists of a main pool, children's pool and spa pool. The indoor facility has a diatomaceous earth filter which serves the main pool and four upright high pressure sand filters which serve the spa and the children's pools.

At the time of construction, the diatomaceous earth filter waste was discharged into coastal waters. This method was found to be environmentally unsatisfactory and was discontinued in late 1999. Ever since, the solid waste from the diatomaceous earth filter has been removed from the site using an effluent disposal contractor, and disposed of at the New Plymouth landfill.

In 1999, a gas-fired heating system was installed to replace the original 'water to water' heat exchange unit which relied on sea water as the source of heat. The old heat exchange unit was removed from the site when the gas-fired unit was commissioned.

Current wastewater management practice for the indoor pools is that backwash water from the spa and children's pools' sand filtration systems continues to be connected to the outfall and is discharged on a daily basis.

The amount of water discharged is equivalent to approximately 120 litres per minute and the total backwash cycle runs for around 5-10 minutes. The maximum volume of the discharge at 1,200 litres is relatively insignificant in the context of the receiving environment, and the visual change is virtually inconspicuous due to the indoor nature of the pools and the frequency of backwashing, which is daily.

The outdoor pools are served by two large open gravity sand filters, which are located at the eastern end of the outdoor complex. These are air scoured and then backwashed through the outfall at high tide. Volumes of backwash water are significant (generally 22 m^3) and the discharge can be a muddy colour for a short time. In the peak of the season, backwashes may be as frequent as 1-2 per week, but generally it is normal to backwash the outdoor pools approximately every two weeks during the summer season (from Labour weekend to Easter).

The outdoor pools are emptied once per year, generally at the start of May, for the purpose of cleaning and maintenance. The discharge of pool water is free of chlorine, as the pools are not in use for at least a week prior to discharge. The pools are cleaned by mechanical methods, including water blasting, and do not involve the use of chemical cleaners. Mutton cloths are placed over the drains during water blasting and cleaning to catch all loose paint chips. The pool cleanings are discharged via the outfall.

Both the indoor and outdoor complexes are chlorinated using chlorine gas, which is contained in two separate 920 kg cylinders and chlorinator systems; one at the eastern boundary and one at the western boundary of the site. From time to time the chlorine gas is complemented by the manual dosing of calcium or sodium hypochlorite.

During July 2004 a medium pressure UV disinfection system was installed at the Aquatic Centre. This has resulted in savings on chemical, heating, maintenance and water costs. The use of the UV system reduces the level of chloramines (combined chlorine compounds), which are the cause of the unpleasant chlorine smells in pools. Since the installation of the system the chlorine levels in the pool have decreased by 3 to 5 times to a level typically below 0.3 ppm. The water is also clearer and less milky, with bacterial levels dropping from low to nearly zero due to the water going through the UV system several times a day. Alterations were undertaken on the indoor facility in 2008 with the construction of year-round waterslides.

Figure 1 Location of the Aquatic Centre

1.3. Resource consents

1.3.1. Water discharge permit

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations.

NPDC holds water discharge permit **2339-4.0** to cover the discharge of swimming pool wastewater and filter backwash wastewater via an ocean outfall into the Tasman Sea. This permit was first issued by the

Council on 1 May 1996 as a resource consent under Section 87(e) of the RMA. It was subsequently renewed on 6 August 2014 and is due to expire on 1 June 2032.

There are ten special conditions attached to this consent.

Condition 1 requires the consent holder to adopt the best practicable option at all times to prevent or minimise any adverse effects on the environment from the exercise of this consent.

Condition 2 specifies the volume and frequency permitted for various pool discharges.

Condition 3 states that no discharge from the emptying of any pool shall occur unless there has been no addition of chemicals to the pool for at least seven days.

Condition 4 specifies the standards which must be met for a range of constituents of the discharge water. This condition applies before entry of the treated wastewater into the receiving waters.

Condition 5 states that on each occasion that a pool is emptied the consent holder shall notify the Chief Executive, Taranaki Regional Council, at least seven working days before any discharge occurs.

Condition 6 states that the discharge is not to have adverse effects on the appearance, odour, and ecology of the receiving environment outside of a five metre mixing zone.

Condition 7 requires that the discharge shall not give rise to a total residual chlorine level of greater than 0.1 g/m^3 beyond a five metre mixing zone.

Condition 8 requires that any discharge shall only occur two hours either side of high tide.

Condition 9 requires the consent holder to maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken in the event of a chemical spill.

Condition 10 is a standard condition providing for consent review and amendment.

The permit is attached to this report in Appendix I.

1.3.2. Coastal structure permit

NPDC holds resource consent **4588-3.0** to erect, place, use and maintain a discharge pipe within the coastal marine area. This permit was first issued by the Council on 1 May 1996. It was subsequently renewed on 6 August 2014 and is next due to expire on 1 June 2032.

The consent has three special conditions attached.

Conditions 1 and 2 require the consent holder to maintain the structure, and to notify the Council prior to any maintenance works.

Condition 3 allows the Council to review any or all of the conditions of this consent for the purpose of ensuring that the conditions adequately deal with any adverse environmental effects arising from the exercise of this consent.

A copy of the permit is attached to this report in Appendix I.

1.4. Monitoring programme

1.4.1. Introduction

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

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

The monitoring programme for the Aquatic Centre consisted of four primary components.

1.4.2. Programme liaison and management

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

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

1.4.3. Site inspections

The Aquatic Centre was visited four times during the monitoring period. The inspections were in relation to the backwash discharge, the outdoor pool discharge and abatement notice EAC-21483. With regard to the consent for the discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. The neighbourhood was surveyed for environmental effects.

1.4.4. Chemical sampling

The Council undertook sampling of the discharges from the site and the water quality in the receiving environment.

Sampling occurred in conjunction with the emptying of the outdoor pool and with one backwash discharge. On both occasions, the collection of discharge samples was followed by the collection of seawater samples. All samples were analysed for chlorine, pH, oil and grease, and suspended solids.

An additional water sample was also collected the morning following the first batch release of pool water, in connection with abatement notice EAC-21483. The unauthorised wastewater discharge occurring through the outfall was sampled. The outdoor pool was not being emptied at the time of sampling.

1.4.5. Marine ecological inspections

Inspections of the marine low tide biota around the vicinity of the discharge pipe were undertaken after a backwash discharge and the emptying of the outdoor pool, to assess compliance with condition 6(d) of the discharge permit.

2. Results

2.1. Inspections

24 January 2017

The Council visited the Aquatic Centre at 08:15 in order to sample the backwash discharge. High tide was at 08:17 (2.8m) and conditions were overcast. A sample of backwash wastewater was collected from the discharge pipe in the maintenance shed, followed by a sample of the receiving seawater from the shoreline approximately five metres east of the outfall.

The reef inspection was carried out at the next low tide (14:33 on 24 January 2017 at 1.1m). Upon arrival at the reef at 14:30, a residual flow of approximately 0.1 to 0.2 L/s was found discharging from the outfall onto the Kawaroa Reef and into the Tasman Sea (Figure 2). The discharge, which was later traced back to the downstairs shower facilities, generated a small quantity of foam, indicating the presence of soaps, detergents and/or other contaminants (Figure 3). An abatement notice was issued, requiring the Aquatic Centre to conduct works to ensure that no unauthorised discharges occur through the marine outfall after 18 April 2017 (incident number 34327; abatement notice EAC-21483).

27 April 2017

An inspection was conducted on 27 April 2017, after the deadline specified in abatement notice EAC-21483 had passed. The weather was fine, sunny and dry at the time of inspection. Low tide that day (0.1m) occurred at 16:25. At the time of the inspection, water was discharging continuously at a constant rate through the outfall onto the reef. Pink/reddish foam and scum that was soapy in texture were clearly visible in the pooled discharge close to the end of the outfall pipe. A soapy or chlorine odour was also noticed. There was a rope close to the outfall mouth that was covered in human hair and other swimming pool debris.

The downstairs ladies changing rooms were inspected, in connection with the unauthorised discharges. The drains in the middle of the changing room and inside one of the shower cubicles were inspected, and the walls were checked for signage. There were no signs advising shower users to not use soap or other contaminants due to direct discharge to the reef. There were no observable measures in place to prevent discharge of contaminants to the reef.

18-19 May 2017

A Council officer visited the Aquatic Centre on 18 May 2017 in order to test the chlorine concentration of the outdoor pool. A sample of outdoor pool wastewater was collected at 09:55, followed by a sample of the receiving seawater later that day at 16:10.

The reef inspection was carried out at the next practicable low tide (09:39 on 19 May 2017 at 1.1m). Upon arrival at the reef at 08:00, a medium residual flow which generated a small quantity of foam was found discharging from the outfall (Figures 2 & 3).

15 June 2017

The inspection commenced at 08:00, in the vicinity of the outfall discharge. The weather was fine, sunny and dry at the time of inspection. Low tide that day (0.9m) occurred at 07:24. At the time of the inspection, water with a noticeable drain odour was discharging at a constant rate through the outfall onto the reef (Figure 2). Soapy foam and clumps of human hair were clearly visible in the pooled discharge close to the end of the outfall pipe (Figure 3).

The marine outfall pipe was also inspected. Cracks were visible on the surface of the cement casing, and the dislodged end of the pipe was situated to the east of the main structure, on the Kawaroa Reef (Photo 2).

Photo 2 Cracks visible on the surface of the marine outfall structure (left), and the 2.4 m length of pipe dislodged from the end of the pipe at the Aquatic Centre (right)

At 08:30, Council staff members were shown a plan of the current drainage layout of the Aquatic Centre. An NPDC employee discussed the works being undertaken to bring the drainage system up to compliance. The described works included diverting wastewater from the women's showers to the sewerage system drainage via a sump, as opposed to the greywater being discharged directly to the stormwater drain and on to the Kawaroa Reef through the outfall pipe.

The filtration systems, backwash system, chemical store, indoor pools and outdoor pools were inspected and all found to be in good working order. The extensive works occurring in the men's changing room facility in relation to the greywater diversion pump, which has since been commissioned, were also inspected (Photo 3). Clearly visible signage was observed in the women's showers, advising users to avoid soaps and shampoos in the interim.

Photo 3 Extensive works being undertaken by NPDC to divert greywater from the women's showers to the sewerage system

Figure 2 Water discharges observed occurring from the marine outfall pipe on the Kawaroa Reef during the 2016-2017 monitoring year

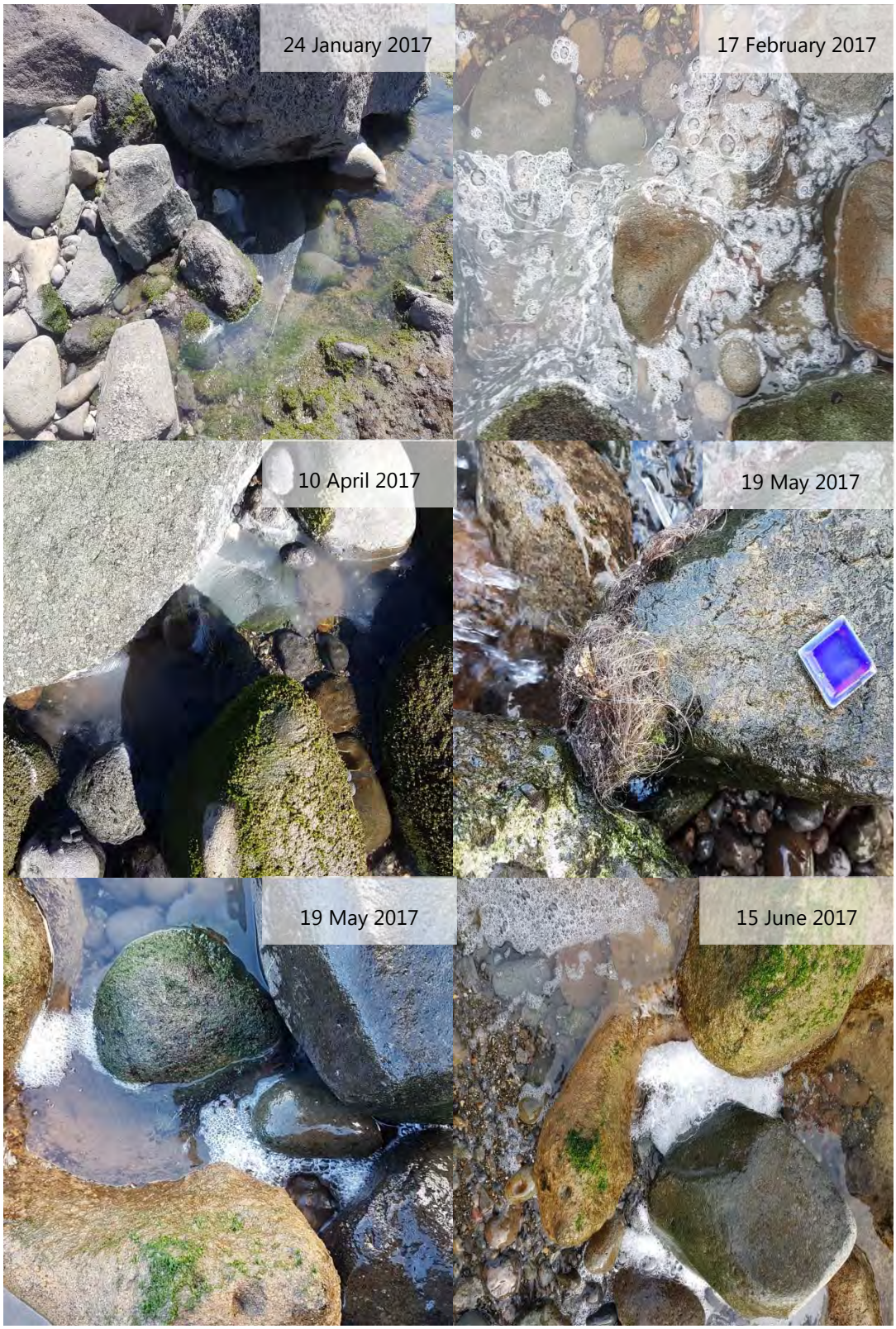

Figure 3 Soapy discharges and shower debris observed in the vicinity of the marine outfall pipe on the Kawaroa Reef during the 2016-2017 monitoring year

2.2. Discharge monitoring

2.2.1. Backwash discharge

A sample of backwash wastewater was collected on 24 January 2017, followed by a sample of the receiving seawater. The backwash sample was collected from the discharge pipe in the maintenance shed. The seawater sample was collected from the shoreline approximately five metres east of the outfall. The results of these samples are presented in Table 1.

Table 1 Water quality results of backwash discharge and receiving seawater samples collected at the Aquatic Centre on 24 January 2017

Parameter	Unit	Backwash wastewater [STW001078]		5 m east of discharge pipe [SEA902051]	
		Result	Consent limit	Result	Consent limit
Temperature	°C	20.9	-	16.8	-
Free chlorine	g/m^3	0.4	-	<0.1	-
Total chlorine	g/m^3	1.4	-	<0.1	0.1
pH	pH	7.6	-	8.0	-
Suspended solids	g/m^3	270	-	60	-
Oil and grease	g/m^3	5.2	-	<0.5	-

A range of pool water contaminants were detected in the backwash discharge sample. However, these elevated contaminant concentrations were not reflected in the seawater sample, and the concentration of total chlorine in the seawater sample was below the consent limit. These results do not indicate any adverse effects on the quality of the receiving seawater due to the backwash discharge.

Further details regarding sample collection can be found in Appendix II.

2.2.2. Emptying of the outdoor pool

A sample of outdoor pool wastewater was collected on 18 May 2017, followed by a sample of the receiving seawater. The pool water sample was collected from the main pool directly. The seawater sample was collected from the shoreline approximately five metres east of the outfall. The results of these samples are presented in Table 2.

Table 2 Water quality results of outdoor pool water and receiving seawater samples collected at the Aquatic Centre on 18 May 2017

Parameter	Unit	Outdoor pool wastewater [STW001079]		5 m east of marine outfall [SEA902051]	
		Result	Consent limit	Result	Consent limit
Temperature	°C	16.8	-	16.3	-
Free chlorine	g/m^3	<0.1	-	<0.1	-
Total chlorine	g/m^3	<0.1	0.5	N/D	0.1
pH	pH	8.2	6.0 - 9.0	8.2	-
Suspended solids	g/m^3	<2	100	180	-

Parameter	Unit	Outdoor pool wastewater [STW001079]		5 m east of marine outfall [SEA902051]	
		Result	Consent limit	Result	Consent limit
Oil and grease	g/m^3	<0.5	15	<0.5	-

Contaminants in the pool water sample were only present in very low concentrations, if at all. Concentrations of chlorine and oil and grease were below the limits of detection. Neither of the samples exceeded any of the consent limits. These results did not indicate any adverse effects on the quality of the receiving seawater due to the emptying of the outdoor pool.

Further details regarding sample collection can be found in Appendix III.

2.2.3. Additional sampling

A sample of unauthorised water discharge was collected from the outfall on 19 May 2017, on the morning following the first batch release of pool water. The results of this sample are presented in Table 3.

Table 3 Water quality results of the additional discharge sample collected from the Aquatic Centre outfall on the Kawaroa Reef on 19 May 2017, on the morning following the outdoor pool discharge

Parameter	Unit	Outfall discharge [STW001079]
Temperature	°C	16.1
Free chlorine	g/m^3	<0.1
Total chlorine	g/m^3	N/D
pH	pH	7.3
Suspended solids	g/m^3	5
Oil and grease	g/m^3	12

Concentrations of chlorine and suspended solids were very low in the sample. The oil and grease concentration was moderate however, and was higher than the oil and grease concentrations found in the backwash and outdoor pool wastewater discharge samples (Tables 1 & 2).

Further details regarding sample collection can be found in Appendix III.

2.3. Marine ecological inspections

Two marine ecological inspections were conducted on Kawaroa Reef in the vicinity of the outfall during the 2016-2017 monitoring year. The first inspection, undertaken on 24 January 2017, was conducted during low tide on the afternoon of the sampled backwash discharge. The second inspection, undertaken on 19 May 2017, was conducted during low tide on the morning following the first batch release of outdoor pool water.

Pool water appeared to have only been released in batches within the designated windows around high tide, as per special condition 8 in the coastal permit.

In summary, the two reef inspections found that the range of intertidal species identified during both inspections was considered normal for that environment. The extensive cover of *Ulva* sp. up to 15 m from the outfall may however indicate a fresh water influence.

Inspection reports can be found in their entirety in Appendices II and III.

2.4. Investigations, interventions, and incidents

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with NPDC. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual courses of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The Incident Register (IR) includes events where NPDC 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 2016-2017 monitoring period, the Council was required to undertake additional investigations and interventions, and to record two incidents, in association with NPDC's conditions in resource consents or provisions in Regional Plans.

During routine monitoring on 24 January 2017, it was found that a foamy discharge was occurring from the marine outfall onto the Kawaroa Reef. The discharge was traced back to the downstairs shower facilities at the Aquatic Centre. It was also found that indoor poolside drains were discharging to the same outfall. Enforcement action was carried out in the form of an abatement notice, issued on 16 February 2017, requiring works to be undertaken to ensure that no unauthorised discharges occur through the marine outfall after 18 April 2017 (abatement notice EAC-21483).

Since the abatement notice was issued, the outfall discharge onto the reef was inspected on three other occasions, on 17 February, 10 April and 27 April 2017. On each of these occasions, water was discharging from the outfall onto the reef at a constant rate and soapy scum was visible in the pool of discharge on the reef (Figures 2 & 3).

The requirement of the abatement notice to undertake works to ensure that no unauthorised discharges occur through the marine outfall after 18 April 2017 was not satisfied. NPDC informed the Council on 15 June 2017 that the first stage of the works required to enable compliance with the abatement notice, and associated consent conditions, was underway, and was due for completion by 30 June 2017. The greywater diversion pump, which diverts greywater from the women's showers to the sewerage network, was commissioned on Monday 26 June, with the Council notified on Tuesday 27 June (Photo 4). The second stage of the works, involving the diversion of greywater from one shower in the men's changing room facility to the sewerage network, was underway at the time of writing this report and was due for completion by 9 September 2017. A sink in the cafeteria, which was also found to be connected to the stormwater network, was in the process of being replaced at the time of writing this report.

Photo 4 Commissioned works undertaken at the Aquatic Centre to divert greywater from the women's showers to the sewerage system (photo courtesy of NPDC, 27 June 2017)

The second incident recorded in the year under review involved blue paint being discharged through the outfall onto the Kawaroa Reef at approximately 20:00 on 23 September 2016. An investigation into the incident found that a paint brush had been washed by a contractor in a laundry tub at the Aquatic Centre. The tub was connected to the stormwater network which discharged onto Kawaroa Reef. A meeting was held with NPDC staff and it was agreed that the tub would be disconnected to prevent any further discharges.

The integrity of the outfall structure was also investigated during the year under review. Observations of cracks along the surface of the structure and the 2.4 m length of pipe that had dislodged from the end of the pipe were addressed with the Aquatic Centre, in relation to condition 2 of consent 4588-3.0 (Photo 2). The Aquatic Centre responded promptly on Monday 22 May with a report stating that the pipe was considered by NPDC to be in safe and sound condition (Appendix IV). Ongoing monitoring of the pipe, including taking photographs for comparison, will continue to shed light on the performance and integrity of the structure.

3. Discussion

3.1. Discussion of site performance

Although there were two discharge-related incidents during the 2016-2017 monitoring period, the incidents were resolved positively and co-operatively, or were in the process of being resolved. At the time of writing this report, the final stages of the works required to ensure that no unauthorised discharges occur through the marine outfall were underway and were due for completion by 9 September 2017.

3.2. Environmental effects of exercise of consents

Sample results from the backwash discharge revealed elevated concentrations of contaminants including chlorine, suspended solids, and oil and grease. Although there are no consent limits relating to the constituents of the backwash discharge, the effects of this are regulated through the permitted timing of the discharge and by monitoring the receiving environment. The results from the seawater sample collected adjacent to the outfall following the backwash did not indicate any adverse effects on the water quality of the receiving environment. However, the high concentrations of different contaminants in the backwash water highlight the importance of scheduling this process to occur within two hours either side of high tide.

Sample results from the outdoor pool water and coastal waters adjacent to the outfall were compliant with consent limits.

Neither of the routine wastewater discharges that were monitored in the period under review appeared to have any major effects on the ecology of the Kawaroa Reef outside of the designated mixing zone. The extensive cover of *Ulva* sp. observed up to 15 m away from the outfall may indicate a fresh water influence, however.

The shortening of the outfall pipe has resulted in wastewater being discharged in shallower areas, higher up the rocky intertidal shore of the Kawaroa Reef. Ongoing ecological monitoring, including photographic monitoring of *Ulva* sp., in the vicinity of the outfall will continue to shed light on whether the shortening of the pipe is adversely affecting the ecology of the Kawaroa Reef.

3.3. Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 3 and 4.

Table 3 Summary of performance for consent 2339-4.0

Purpose: ***Discharge swimming pool wastewater and filter backwash wastewater***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practice to prevent or minimise adverse effects	Inspections and correspondence	No
2. Limits on volume and frequency of discharge	Not assessed during period under review	N/A
3. No chemicals added to pool within seven days prior to discharge	Samples collected	Yes
4. Limits on discharge constituents	Samples collected	Yes

Purpose: *Discharge swimming pool wastewater and filter backwash wastewater*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Council notified by the Aquatic Centre seven days prior to discharge	Aquatic Centre communicating with the Council via email and phone	Yes
6. Effects not observed beyond mixing zone	Inspection	Undetermined
7. Chlorine concentration limit beyond mixing zone	Samples collected	Yes
8. Discharge to occur within two hours of high tide	Inspection	Yes
9. Contingency plan	Plan reviewed in June 2016	Yes
10. Option for review of consent	Next consent review date June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Improvement required** **Good**

During the year, NPDC demonstrated a level of environmental performance that required improvement and a good level of administrative performance with regard to resource consent 2339-4.0 as defined in Section 1.1.4. Compliance with consent conditions was not upheld throughout the period of review, as two incidents were recorded with respect to unauthorised wastewater discharges.

Table 4 Summary of performance for consent 4588-3.0

Purpose: *To erect, place and maintain a discharge pipe*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification prior to changes to nature or scale of structure	Inspection	No
2. Maintenance of structure	Inspection	No
3. Review of consent conditions	Next consent review date June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Improvement required** **Good**

During the year, NPDC demonstrated a level of environmental performance that required improvement and a good level of administrative performance with regard to resource consent 4588-3.0 as defined in Section 1.1.4. Compliance with consent conditions was not upheld throughout the period of review, as the integrity of the structure was not suitably maintained.

3.4. Recommendations from the 2015-2016 Annual Report

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

1. THAT monitoring of discharges from the Aquatic Centre in the 2016-2017 year continues at the same level as in 2015-2016.

This recommendation was implemented in full.

3.5. Alterations to monitoring programmes for 2017-2018

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

- the extent of information made available by previous authorities;
- its relevance under the RMA;
- its obligations to monitor emissions/discharges and effects under the RMA; and
- to report to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki emitting to the atmosphere/discharging to the environment.

It is proposed that for 2017-2018, the programme remains unaltered from that for 2016-2017. A recommendation to this effect is attached to this report.

4. Recommendations

1. THAT monitoring of consented activities at the Aquatic Centre in the 2017-2018 year continues at the same level as in 2016-2017.

Glossary of common terms and abbreviations

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

Biota	Flora and fauna of a particular place.
Bund	A wall around a tank to contain its contents in the case of a leak.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome has actually occurred.
Intervention	Action/s taken by the Council to instruct or direct actions to be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by the Council to establish the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	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.
L/s	Litres per second.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	Resource Management Act 1991 and subsequent amendments.
SS	Suspended solids.
Temp	Temperature, measured in degrees Celsius (°C).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.

For further information on analytical methods, contact the Council's laboratory.

Bibliography and references

Taranaki Regional Council, 2016: Todd Energy Aquatic Centre Monitoring Programme Annual Report 2015-2016. Technical Report 2016-104.

Taranaki Regional Council, 2015: Todd Energy Aquatic Centre Monitoring Programme Annual Report 2014-2015. Technical Report 2015-13.

Taranaki Regional Council, 2014: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2013-2014. Technical Report 2014-10.

Taranaki Regional Council, 2013: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2012-2013. Technical Report 2013-98.

Taranaki Regional Council, 2012: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2011-2012. Technical Report 2012-44.

Taranaki Regional Council, 2011: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2010-2011. Technical Report 2011-71.

Taranaki Regional Council, 2010: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2009-2010. Technical Report 2010-95.

Taranaki Regional Council, 2009: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2008-2009. Technical Report 2009-25.

Taranaki Regional Council, 2008: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2007-2008. Technical Report 2008-35.

Taranaki Regional Council, 2007: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2006-2007. Technical Report 2007-31.

Taranaki Regional Council, 2006: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2005-2006. Technical Report 2006-52.

Taranaki Regional Council, 2005: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2004-2005. Technical Report 2005-29.

Taranaki Regional Council, 2004: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2003-2004. Technical Report 2004-27.

Taranaki Regional Council, 2003: New Plymouth District Council New Plymouth Aquatic Centre Monitoring Programme Annual Report 2002-2003. Technical Report 2003-49.

Taranaki Regional Council, 2002: New Plymouth District Council Fletcher Challenge Energy Aquatic Centre Monitoring Programme Annual Report 2001-2002.
Technical Report 2002-42.

Taranaki Regional Council, 2001: New Plymouth District Council Fletcher Challenge Energy Aquatic Centre Monitoring Programme Annual Report 2000-01.
Technical Report 2001-77.

Taranaki Regional Council, 2000: New Plymouth District Council Fletcher Challenge Energy Aquatic Centre Monitoring Programme Annual Report 1999-2000.
Technical Report 2000–54.

Appendix I

Resource consents held by New Plymouth District Council

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

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	06 August 2014
Commencement Date	06 August 2014

Conditions of Consent

Consent Granted:	To discharge public swimming pool wastewater and filter backwash wastewater via an ocean outfall into the Tasman Sea
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026, and in accordance with special condition 10
Site Location:	Tisch Avenue, New Plymouth
Legal Description:	Adjacent to Pt Sec E Tn of New Plymouth
Grid Reference (NZTM)	1692028E-5676596N (point of discharge)
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 all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The consent authorises the following discharges:

   a) up to 20 cubic metres per fortnight of outdoor pool treated filter backwash,
   b) up to 1.2 cubic metres per day of indoor children's pool and spa sand treated filter backwash,
   c) up to 1000 cubic metres of pool wastewater on two occasion per year for the purpose of emptying the indoor or outdoor swimming pool systems.

3. No discharge from the emptying of any pool shall occur unless there has been no addition of chemicals to the pool for at least seven days.

4. Constituents of the discharge from the emptying of either pool shall meet the standards shown in the following table.

Constituent	**Standard**
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm^{-3}
Oil and grease	Concentration not greater than 15 gm^{-3}
Total residual chlorine	Concentration not greater than 0.5 gm^{-3}

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

5. On each occasion that a pool is emptied the consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 7 working days before any discharge occurs. Notification shall include the consent number and a brief description of the activity consented, and shall be emailed to worknotification@trc.govt.nz.

6. After allowing for reasonable mixing, within a mixing zone extending 5 metres of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) any significant adverse effects on aquatic life.

7. Beyond a mixing zone of 5 metres the discharge shall not give rise to a total residual chlorine level of greater than 0.1 gm-3

8. Any discharge shall only occur two hours either side of high tide.

9. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken in the event of a chemical spill. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity as being adequate to avoid, remedy or mitigate the environmental effects of such an event.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:

    a) during the month of June 2020 and/or June 2026, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
    b) annually during the month of June for the purpose of including conditions requiring provision of records necessary to check compliance with condition 2.

Signed at Stratford on 06 August 2014

For and on behalf of
Taranaki Regional Council

_____

A D McLay
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:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date	06 August 2014
Commencement Date	06 August 2014

Conditions of Consent

Consent Granted:	To occupy the Coastal Marine Area with a discharge pipe from the New Plymouth Aquatic Centre
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026
Site Location:	Tisch Avenue, New Plymouth
Legal Description:	Adjacent to Pt Sec E Tn of New Plymouth
Grid Reference (NZTM)	1692028E-5676596N
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 all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. This consent authorises the occupation of space in the Coastal Marine Area by the outlet structure existing at the time the application for this consent was lodged, and as described in the application. Any change to the nature or scale of the structure may therefore need to be authorised by a formal process in accordance with the Resource Management Act, 1991.

2. The consent holder shall maintain the structure in a safe and sound condition such that it continues to function effectively as an outlet structure.

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 2020 and/or June 2026 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 06 August 2014

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Appendix II

Marine ecological inspection
24 January 2017

File note

26 January 2017

Document: 1809211

Todd Energy Aquatic Centre intertidal reef inspection – 24 January 2017

On Tuesday 24 January 2017, the Taranaki Regional Council (the Council) visited the Todd Energy Aquatic Centre (TEAC) at 08:15 (DST) in order to sample the backwash discharge. High tide was at 08:17 (2.8m). The backwash commenced at 08:28 and discharged for approximately five minutes. The backwash discharge sample was grey, turbid and odourless. A shoreline water sample was collected approximately 5 m east of the outfall at 08:40. The shoreline water sample was slightly turbid grey and smelt of seawater.

The results of the backwash discharge sample and shoreline seawater sample are presented in Table 1.

Table 1 Results of backwash discharge and shoreline seawater samples collected on 24 January 2017

Parameter	Unit	Backwash discharge [STW001079]	5 m east of outfall [SEA902051]	
		Result	Result	Consent limit
Temperature	°C	20.9	16.8	-
Free Chlorine	g/m^3	0.4	<0.1	-
Total Chlorine	g/m^3	1.4	<0.1	0.1
pH	pH	7.6	8.0	-
Suspended solids	g/m^3	270	60	-
Oil and grease	g/m^3	5.2	<0.5	-

The backwash discharge sample contained elevated concentrations of chlorine, oil and grease, and suspended solids (Table 1). The concentration of total chlorine in the shoreline sample was below the detection limit and compliant with the consent. The concentration of oil and grease in the shoreline sample was below the detection limit and the pH was within the typical range for seawater. The sample contained a high concentration of suspended solids.

The sea, which was calm with little swell, did not appear discoloured or otherwise adversely affected by the discharge at the time the samples were taken (Photos 1). The inshore waters appeared turbid grey / brown up and down the coast, indicative of the recent rainfall and turbulent conditions.

Photo 1 Outfall pipe at time of shoreline water sampling

The reef inspection was carried out at the next low tide (14:33 on 24 January 2017 at 1.1m). Upon arrival at the reef at 14:30, a residual flow was found discharging from the outfall (approximately 0.1 - 0.2 L/s). As had previously been discussed with TEAC staff, the origin of this discharge may have been the site stormwater system, which aside from rain routinely collects water from swimmers and taps / hoses. However, the discharge started to generate a small quantity of foam; suggesting some of the water that is reaching the outfall may potentially carry soaps, detergents or other contaminants. The discharge persisted for the duration of the inspection (approximately 30 minutes). There were no odours detected at the discharge point; chlorine or otherwise. Patches of surface scum were found on tidal pools in the vicinity of the outfall. Most of these patches were found along the flow path of the outfall discharge. Most patches were found within 5 m from the discharge point, although some were found approximately 5 to 10 m away. A high proportion of the gastropods found along the flow path of the discharge were clustered above water level. Contrary to previous inspections, no brown microbial mats were found on the reef. However, the cover of algae (thought to be *Ulva intestinalis*) surrounding the outfall was very high. Unidentified grey mats (likely to be either a colonial ascidian or sponge) were observed in the vicinity of the outfall, as in previous inspections.

Photo 2 Foam discharging from outfall

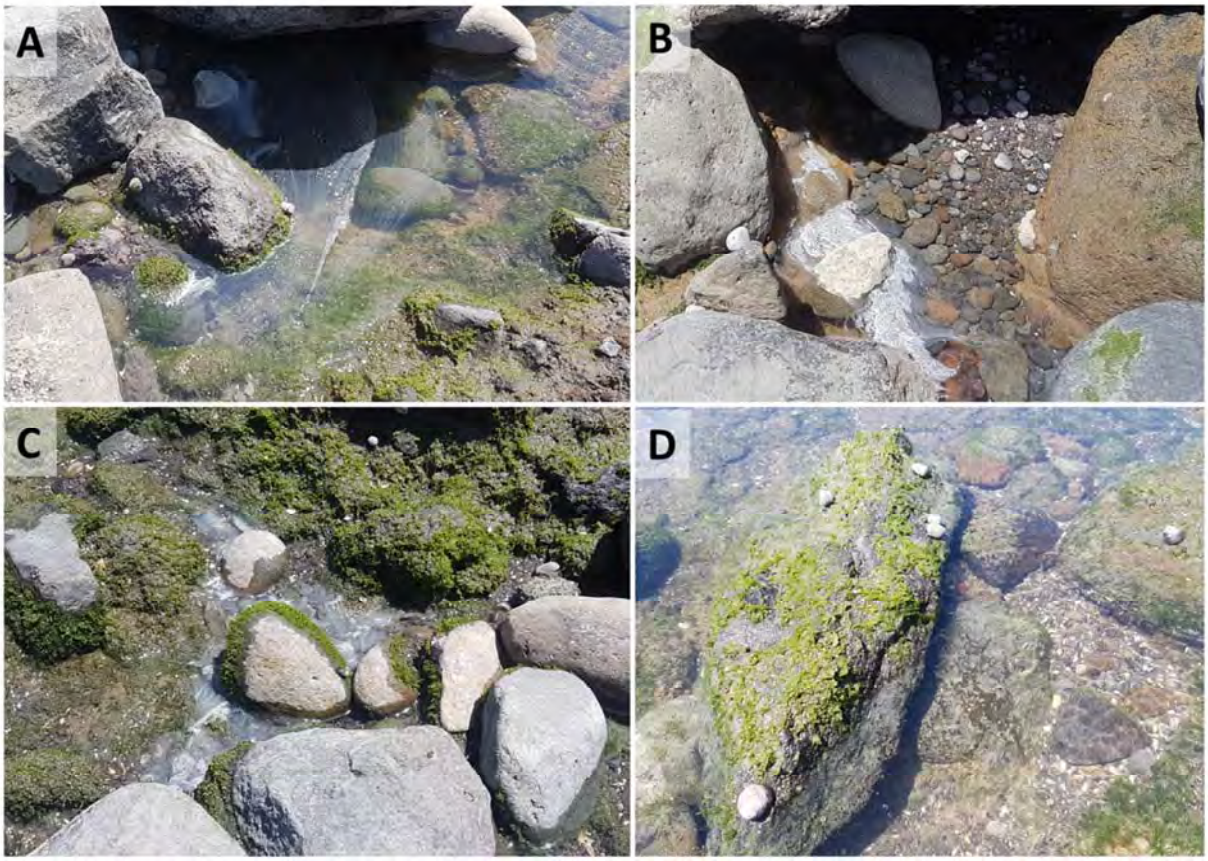

Photo 3 a,b,c) surface scum, d) gastropods above water

The following invertebrates were present on the upper shore in the vicinity of the pipe: molluscs *Melagraphia aethiops*, *Diloma* sp., *Cellana radians, C. ornata, Xenostrobus pulex,* polychaete worm *Spirobranchus carniferus* and barnacle *Chamaesipho columna*. A species of green algae resembling *Ulva intestinalis* was present with high cover, and the red algal species *Gelidium caulacantheum* was also present.

Further down on the shore, still within the influence of the pipe discharge, the following species were identified: molluscs *Haustrum scobina* (very abundant),*H. haustorium, M. aethiops, Chiton glaucus, C. radians, C. ornata,* barnacles *Chamaesipho columna* and *Epopella plicata*, echinoderms *Evechinus chloroticus* and *Patiriella regularis,* and the polychaete worm *Spirobranchus cariniferus*. Red algae included *C. officinalis* and encrusting coralline algae. Brown algae included *Hormosira banksia (*high cover*), Notheia anomala,* and *Ralfsia* sp. The green alga *Chaetomorpha aerea* was also present. The unidentified grey mat and microbial growths were not present in this area on the reef.

In comparison with the intertidal community further down the shore, the area surrounding the pipe supported very little biomass and diversity (Photo 4). However, this assemblage was similar to that found on previous inspections, and up shore intertidal reef environments generally support less biomass and diversity than down shore environments. The assemblage of species found down shore from the outfall was similar to what would be expected at this elevation on the shore and was comparable with previous inspections (Photo 4).

Photo 4 up shore (left) and down shore (right) intertidal reef communities

The discovery of the outfall's steady residual flow and its production of foam and surface scum raise concerns around sources of water draining to the outfall. This persistent flow is indicative of a water source additional to the intermittent contributions from swimmers, taps and hoses. Furthermore, the production of foam also raises the question of its origin. It is evident from the results of this reef inspection, that these discharges can have adverse effects on the reef. Such adverse effects were demonstrated by the presence of foam and surface scum, and also the movement of gastropods to positions out of the water.

In order to resolve these issues and prevent further damage to the reef, please respond to the following:

1. Are there any areas of uncertainty regarding the drainage configuration at TEAC?
2. Please provide an explanation for the persistent discharge observed at the outfall on 24 January 2017.
3. Please provide an explanation for the generation of foam at the discharge point that was observed during the inspection.

Please note that it is encouraging to see TEAC's commitment to improving the environmental awareness of staff, contractors and swimmers through the installation of signage at the various stormwater drains.

In summary, despite the high concentration of contaminants discharged during the backwash, no environmental effects were detected. Despite no adverse effects being detected, it is recommended that the backwash discharge is redirected to sewer as soon as practicable. The residual outfall discharge discovered during the reef inspection did appear to be adversely affecting the reef.

Thomas McElroy

Technical Officer

Emily Roberts

Marine Ecologist

Appendix III

Marine ecological inspection
19 May 2017

File note

9 June 2017

Document: 1878398

Todd Energy Aquatic Centre intertidal ecological inspection – 19 May 2017

On Tuesday 9 May 2017, the Taranaki Regional Council (the Council) received notification from Todd Energy Aquatic Centre (TEAC) staff that they were ready to empty the outdoor swimming pool on Thursday 11 May 2017. Emptying of the pool was delayed until Thursday 18 May 2017. This enabled time for TEAC and Council staff to meet up just prior to pool discharge to discuss a number of issues relating to consent compliance. These issues included:

- Damage to the outfall pipe (consent 4588-3)
- Discharge of outdoor pool water two hours either side of high tide (condition 8, consent 2339-4)
- Managing contaminants in the unauthorised discharge (abatement notice EAC-21483)

Pool water testing, undertaken at 09:55 on 18 May 2017, found that the concentrations of both free and total chlorine were below the detectable limit (<0.1 g/m^3). Following this, TEAC staff were advised that the chlorine concentration was in compliance with condition 4 of resource consent 2339-4, and that they could begin emptying their pool within 2 hours of the next high tide (providing compliance with condition 8). High tide was at 14:49 (NZST) on the day of the inspection. Samples were collected from the Tasman Sea at approximately 16:10 (Photo 1). The outfall was inspected again at 18:30 on the same day to check compliance with condition 8, consent 2339-4. Discharge from the outdoor pool had ceased, indicating compliance with condition 8, at the time of inspection.

Photo 1 Discharge from the outfall pipe shortly after shoreline seawater sampling adjacent to the discharge pipe, 18 May 2017

The results of the pool discharge and shoreline seawater samples are listed in Table 1. Neither sample exceeded any of the consent limits.

Table 1 Results of pool discharge, shoreline seawater samples (18 May 2017) and unauthorized outfall discharge at low tide (19 May 2017)

Parameter	Unit	18 May 2017				19 May 2017
		Outdoor pool prior to emptying [STW001079]		5 m east of outfall [SEA902051]		Discharge from outfall the following day [STW001079]
		Result	Consent limit	Result	Consent limit	Result
Temperature	ºC	16.8	-	16.3	-	16.1
Free Chlorine	g/m^3	<0.1	-	<0.1	-	<0.1
Total Chlorine	g/m^3	<0.1	0.5	<0.1	0.1	<0.1
pH	pH	8.2	6.0 – 9.0	8.2	-	7.3
Suspended solids	g/m^3	<2	100	180	-	5
Oil and grease	g/m^3	<0.5	15	<0.5	-	12

The next practicable low tide during which a reef inspection could be carried out was at 09:39 on 19 May 2017 (1.1m). A medium flow was discharging from the marine outfall (Photo 3) upon arrival at the reef (at approximately 08:15). The origin of the outfall discharge was unlikely to have been from the outdoor pool as the pool had only been partly emptied since the previous day. A sample of the discharge was taken at approximately 09:05. Foam and shower debris, including a shower tile, human hair, a hair clip and an entry wristband, were observed in the vicinity of the outfall (Photos 2 & 4). A TEAC membership card was also found at the outfall on the previous day. The reef inspection found no detectable chlorine odour.

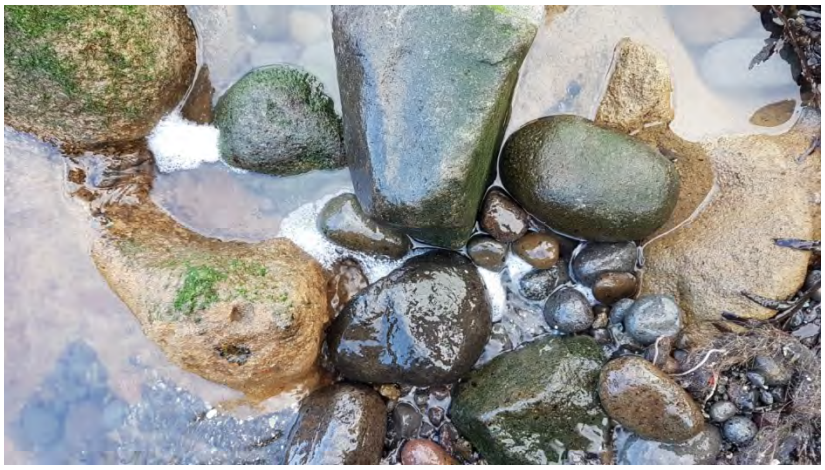

Photo 2 White foam in turbid water found in the pool adjacent to the outfall at approximately 09:00 on 19 May 2017

Photo 3 (A) Medium flow discharging from the outfall on 19 May 2017;
(B) Close-up of water discharging from the outfall, with human hair visible in the vicinity of the outfall

Photo 4 (A) Clumps of human hair and a shower tile found in the vicinity of the outfall on 19 May 2017, with water discharge from the outfall visible to the left;
(B) Human hair and a TEAC wristband, also found at the outfall

The following invertebrates were present on the upper shore in the vicinity of the pipe: molluscs *Melagraphia aethiops* (relatively abundant), *Turbo smaragdus, Diloma* sp., *Cellana radians, Sypharochiton pelliserpentis*, and barnacle *Chamaesipho* sp. A species of green alga resembling *Ulva intestinalis* extensively covered the upper shore, and spread beyond 5m from the outfall (Photo 5). Although this species occurred along the high tide mark on the coast, it was more prolific around the outfall (Photo 5). The green alga *Chaetomorpha* sp. was also observed in the mixing zone. The brown alga *Ralfsia* sp., and the red algal species *Gelidium caulacantheum* and *Corallina officinalis* were present within 5 m of the outfall, although there was very little *Corallina officinalis*. In comparison with the intertidal community further down the shore, the area surrounding the pipe supported very little biomass and was less diverse (Photo 6). However, this assemblage was similar to that found on previous inspections in the vicinity of the pipe, and is typical for this height on the shore.

Photo 5 (A) Some Ulva sp. cover and limited biodiversity at the high tide mark, west of the outfall; (B) Extensive and prolific Ulva sp. cover 0-15 m from the outfall

Further down on the shore, still within the influence of the pipe discharge, the following species were identified: molluscs *Haustrum scobina* (very abundant), *Haustrum haustorium, M. aethiops* (very abundant), *Cominella maculosa, Chiton glaucus, Ischnochiton maorianus, C. radians, Cellana ornata* and *Diloma* sp., the urchin *Evechinus chloroticus,* anemone *Isactinia olivacea*, barnacles *Chamaesipho* sp. and *Epopella plicata*, the crustacean *Pagurus* sp., and the polychaete worms *Spirobranchus cariniferus* and *Spirobis* sp. Red algae included *C. officinalis* and encrusting coralline algae. Brown algae included *Hormosira banksii* (very abundant), the obligate epiphyte *Notheia anomala,* and *Ralfsia* sp. The green alga *Chaetomorpha aerea* was also present. Overall, these species are similar to what would be expected at this elevation on the shore.

Photo 6 (A) Limited biodiversity, and greater *Chaetomorpha* coverage, within 5 m of the outfall;
(B) Greater biodiversity in a rockpool approximately 15 m away from the outfall

In summary, the composition of intertidal species identified during this inspection was considered normal for this type of environment. However, the prolific growth of certain algal species, including *Ulva* sp. and *Chaetomorpha* sp., up to 15 m from the outfall may indicate a fresh water influence.

Angela Smith

Technical Officer

Emily Roberts

Marine Ecologist

Appendix IV

NPDC report
"Aquatic Centre Stormwater Outfall"

AQUATIC CENTRE STORMWATER OUTFALL

BACKGROUND

Following a Taranaki Regional Council inspection the out fall was deemed to not meet consent conditions in consent 4588-3.0 and therefore requires repair.

OVERVEIW

- An onsite inspection was undertaken on 19 May 2017 with NPDC staff to check the integrity of the pipeline.
- A 2.4m length of pipe has become dislodged off the end of the pipe.
- City Care Ltd was engaged to CCTV the internal pipe from the end of the outfall pipe to the shore line.
- The current distance off the high tide mark is 29.7m.
- The old distance of the high tide mark was 32.1m.

OUTCOME

- The CCTV confirmed that the internal structure of the pipe is in good condition.
- The length of the outfall has only been shortened by 2.4m from the high tide mark.
- The current pipe to seabed foundation is in good condition.
- The crack along the top external pipe/concrete casing is superficial.

CONCLUSION

- The overall outfall length has been shortened by 2.4m.
- The pipe is considered to be in a safe and sound condition and will continue to function effectively as an outlet structure, in accordance with special condition 2.