

Taranaki Thoroughbred Racing
Groundwater Abstraction
Monitoring Programme Report
2013-2014

Technical Report 2014-119

ISSN: 1178-1467 (Online)
Document: 1516927 (Word)
Document: 1526498 (Pdf)

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July 2015

Executive summary

Taranaki Thoroughbred Racing (TTR) owns and operates the Pukekura Raceway, located on Coronation Avenue, New Plymouth. The site is located within the Te Henui catchment, and forms part of the eastern boundary of Pukekura Park.

TTR was granted resource consent 7470-1 in August 2009 by the Taranki Regional Council (the Council). The consent authorised the abstraction of up to 170 cubic metres per day (m³/day) of groundwater from an on-site production bore, at a rate not exceeding 10 litres per second. This consent was amended to 7470-1.1 on 10 June 2014, where the maximum daily abstraction limit was increased to 500 m³/day. Groundwater abstracted under the consent is primarily used for irrigation purposes but also for the watering of Council-owned gardens within New Plymouth District, and other general purposes within Pukekura Park. The consent includes 10 special conditions setting out the requirements that the consent holder must satisfy.

This report for the period July 2013 to June 2014 describes the monitoring programme carried out by the the Council to assess the consent holder's environmental performance and level of compliance with consent 7470-1 and 7470-1.1.

During the year under review TTR demonstrated an overall good level of environmental performance.

To monitor the exercising of consent 7470-1 and 7470-1.1, abstraction volume and rate data is recorded electronically at the site by a datalogging system and is transferred to the Council via a telemetry system so the data can be viewed in real time. Three groundwater observation bores were also installed within the vicinity of the production bore to monitor the effects of the abstraction on local groundwater levels. Water levels within two of the observation bores are monitored electronically by pressure transducers. The pressure transducers are programmed to record measurements at 30 minute (GND2102) and 15 minute (GND2103) intervals

The Council's monitoring programme for the period under review included five inspection visits to the site. Inspection visits typically comprised of a visual inspection of the production bore, abstraction pipework, monitoring equipment and associated infrastructure, obtaining manual measurements of groundwater levels in the production and observation bores, and retrieving electronic data.

The results of the monitoring carried out during the period under review indicate that abstraction of groundwater authorised by consent 7470-1 is not resulting in any adverse effects on any existing groundwater takes in the site locality. The data also indicates that the abstraction is having no adverse effect on shallow groundwater levels, and is therefore having no impact on any local groundwater fed surface water systems.

In August 2013, the Council was required to record an Unauthorised Incident (UI) for non-compliance with the conditions of consent 7470-1. The non-compliance related to the exceedance of the authorised daily abstraction volume on several occasions over the period July 2012 to May 2013. The non-compliance resulted in an abatement notice being issued in September 2013. Due to further exceedances TTR were issued with an infringement notice on the 7 March 2014.

During the year under review the consent holder demonstrated an improvement required level of environmental performance and a good level of administrative performance with

consent 7470-1. TTR demonstrated a high level of environmental performance and a good level of administrative performance with consent 7470-1.1.

For reference, in the 2013-2014 year, 60% 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 29% demonstrated a good level of environmental performance and compliance with their consents.

This report includes recommendation for the 2015-2016 monitoring year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

The following report by the Taranaki Regional Council (the Council) describes the monitoring programme associated with resource consent 7470-1 and 7470-1.1, held by Taranaki Thoroughbred Racing (TTR). TTR operates a race track and associated facilities on Coronation Avenue, New Plymouth. The site is located within the Te Henui catchment. Consent 7470-1 authorises the abstraction of up to 170 cubic metres per day (m³/day) of groundwater from a production bore at the site, at a rate not exceeding 10 litres per second (l/s) and the updated 7470-1.1 authorises the abstraction of up to 500 (m³/day) of groundwater from a production bore at the site, at a rate not exceeding 10 (l/s).

A report was completed in February 2014 which outlined and discussed the results of the monitoring carried out during the 2009-2013 monitoring periods. This report covers the results and findings of the monitoring programme implemented by the Council in respect of consents 7470-1 and 7470-1.1 over the monitoring period July 2013 to June 2014.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations and general approach to monitoring sites through annual programmes. It also provides details of the resource consent held by TTR for the abstraction of groundwater within the Te Henui catchment, and the nature of the monitoring programme in place for the period under review.

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 2014-2015 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 a discharger, 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):
- (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 discharge source. 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 performance of resource users against regional plans and consents. Compliance monitoring, (covering both activity and impact), 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 to resource management, and ultimately, through the refinement of methods and considered responsible resource utilisation, move closer to achieving sustainable development of the regions resources.

1.1.4 Evaluation of environmental and consent performance

Besides discussing the various details of the performance and extent of compliance by the consent holder during the period under review, this report also assigns a rating as to TTR's environmental and administrative performance.

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

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

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

Environmental Performance

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

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

For example:

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

Improvement required Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

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

Administrative compliance

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

Good Perhaps some administrative requirements of the resource consents were not met at a particular time, however 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 2013-2014 year, 60% 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 29% demonstrated a good level of environmental performance and compliance with their consents.

1.2 Background

The production bore operated by TTR was drilled and constructed by Borewell NZ Limited. The construction of the bore was completed on 27 March 2009, and it was assigned Council reference code GND2010. The bore is located to the south of the main race track, approximately 40 m from the site's boundary with Pukekura Park (Figure 1).

The geological log of the bore indicates volcanic sand and gravel layers, interbedded with peat horizons, were encountered to a depth of 86 m. Mudstone (papa) was encountered from 86 m to 131 m (total depth). The bore log indicates that three separate water bearing layers were encountered during drilling. The bore was completed with alternating 150 mm stainless steel spacers and 178 mm diameter stainless steel screen between 62 m and 83 m. The total screen length is 12 m.

Following a sequence of exceedances of the maximum daily abstraction volumes and rates, an application was received by the Council from TTR to change the consent conditions of 7470-1 to increase the maximum daily abstraction volume from 170 m³ to 500 m³. The purpose of the consent was also altered. The potential for adverse effects on downgradient surface water systems as a result of the abstraction was deemed negligible. These changes were granted on 10 June 2014 and updated the consent number from 7470-1 to 7470-1.1.

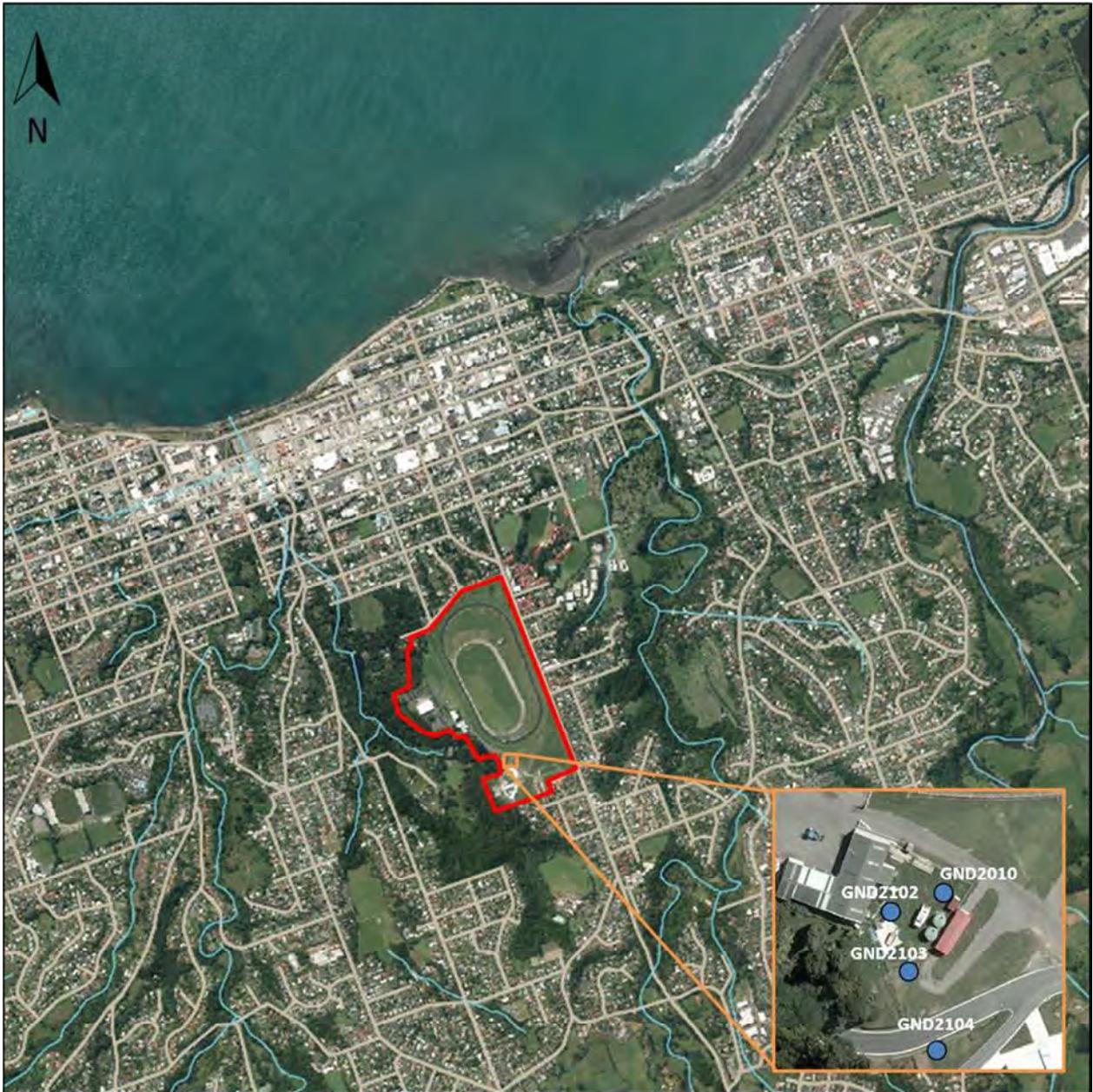


Figure 1 Location of Taranaki Thoroughbred Racing site, the production and observation bores

1.3 Resource consents

1.3.1 Water abstraction permit

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly authorised by a resource consent or a rule in a regional plan, or it falls within a particular category set out in Section 14.

TTR holds water permit **7470-1.1**, to take and use groundwater from a bore for watering of racing tracks and general purposes at the TTR Club, and filling of water tanks for watering of Council-owned gardens within New Plymouth District, and other general purposes within Pukekura Park. This permit was issued by the Council on 10 June 2014 under Section 87(d) of the RMA. It is due to expire on 1 June 2020. This is an update of water permit **7470-1**, to take and use groundwater from a bore for watering of racing tracks and general purposes at the Taranaki Racing Club, which was granted on 20 August 2009 under Section 87(d) of the RMA. Both consents were active during the period under review; 7470-1 was active between 1 July 2013 and 9 June 2014 and 7470-1.1 was active between 10 June and 30 June 2014.

The consents include 10 special conditions setting out specific requirements with which the consent holder must comply. The conditions attached to the consent are summarised below.

7470-1

- Condition 1 imposes limits on the volume and rate of abstraction;
- Condition 2 requires the consent holder to install a water meter to record the volume of water being abstracted and an electronic data logging device which meets the required specification;
- Condition 3 requires that the bore be labelled with the Council reference code;
- Condition 4 requires the consent holder to maintain a continuous record of groundwater level in observation bores by installing automatic level recording devices which meet the required specification;
- Condition 5 requires that an additional observation bore remain accessible for New Plymouth District Council (NPDC) to monitor water levels;
- Condition 6 requires all records of water abstraction and groundwater level monitoring to be submitted to NPDC at stipulated intervals;
- Condition 7 requires all electronic records of water abstraction and groundwater level monitoring to be made available to the Council;
- Condition 8 requires the consent holder to adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including the efficient use of water;
- Condition 9 is a lapse condition; and
- Condition 10 is a review condition.

7470-1.1

- Condition 1 imposes limits on the volume and rate of abstraction;
- Condition 2 requires the consent holder to install a water meter to record the volume of water being abstracted and an electronic data logging device which meets the required specification;
- Condition 3 requires the data required in condition 2 to be transmitted to the Council in a format to maintain a 'real time' format.
- Condition 4 requires that the bore be labelled with the Council reference code;
- Condition 5 requires the consent holder to maintain a continuous record of groundwater level in observation bores by installing automatic level recording devices which meet the required specification;

- Condition 6 requires that an additional observation bore remain accessible for New Plymouth District Council (NPDC) to monitor water levels;
- Condition 7 requires all records of water abstraction and groundwater level monitoring to be submitted to NPDC at stipulated intervals;
- Condition 8 requires the consent holder to adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including the efficient use of water;
- Condition 9 is a lapse condition; and
- Condition 10 is a review condition.

Copies of the permits are included in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets out obligation upon the Council to gather information, conduct research, and monitor the effects arising with regard to the exercising of resource consents within the Taranaki region, and to report on the results.

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 associated with consents 7470-1 and 7470-1.1 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 the consent holder over consent conditions, 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, the content of regional plans, and consultation on associated matters.

1.4.3 Site inspections

The TTR site was visited on five occasions during the period under review for the purpose of undertaking inspections. A typical inspection visit included;

- Obtaining static water level measurements from the production and observation bores;
- Taking instantaneous abstraction volume and rate readings from the production bore flow meter;
- Taking instantaneous abstraction volume and rate readings from data logger display for comparison with flow meter readings;
- Downloading electronic abstraction and water level data and;
- Carrying out a general visual inspection of the production bore headworks, pipework and water storage infrastructure.

1.4.4 Monitoring and review of abstraction data

The volume and rate of abstraction from GND2010 is recorded electronically on a datalogging unit and transferred to the council via telemetry. In order to assess compliance with the special conditions of consents 7470-1 and 7470-1.1, a review of all abstraction data is carried out for comparison against stipulated limits. All data needs to be processed and checked for accuracy before any analysis can be carried out.

1.4.5 Monitoring and review of groundwater level data

In order to monitor the effects of the abstraction authorised under consents 7470-1 and 7470-1.1 on local groundwater levels and flow regimes, groundwater levels were measured manually in both the production and observation bores during inspection visits. Pressure transducers were installed in observation bores GND2102 and GND2103. In addition, an atmospheric logger was also installed to measure and record barometric pressure. The electronic data was downloaded by Council Officers during inspection visits. Manual measurements of water level are also obtained from the third bore during inspection visits. All data needs to be processed by Council staff and checked for accuracy before any analysis can be carried out.

2. Results

2.1 Inspections

During the period under review, five inspection visits were carried out in relation to consents 7470-1 and 7470-1.1. The following observations were recorded:

4 July 2013

Repairs that had been made to GND2102 by Harry Dixon of Strata Drilling were inspected. The protective casing had been extended up by 2.65 m, preventing rainfall runoff from entering the bore at the surface. Manual water level measurements were carried out at GND2101, GND2102, GND2103 and GND2104. No abstraction occurred during the inspection visit.

25 September 2013

No abstraction occurred during the inspection visit. An abatement notice was hand delivered to Carey Hobbs, the Chief Executive Officer of TTR, due to the exceedance of the maximum daily abstraction volume (170 m³/day). TTR staff stated they were now more aware of daily abstraction limits so over abstraction was unlikely to reoccur in the future. An iCE3 telemetry device was installed on the data logger in GND2101. A manual water level measurement was also carried out at this bore.

17 October 2013

Manual water level measurements were carried out at GND2103, GND2102 and GND2101. Access could not be gained to GND2104 as the manhole cover could not be removed. Data was downloaded from the data logger in GND2101. Groundwater level data was downloaded from hobo loggers in GND2102, GND2103 and the barometric hobo logger.

24 October 2013

Manual water level measurements were carried out at GND2101, GND2102 and GND2103. There was a mouse nest found inside the flowmeter box. It was suggested this be cleaned out to prevent the possibility of mice chewing through wires. A hobo logger on a 24 m cable was removed from GND2103 and a new Solinst level logger on a 30 m cable was installed.

11 March 2014

Two additional 30 m³ tanks were noted on site waiting to be installed, which would bring the total storage to 176 m³. The label on GND2102 was found to be faded and unreadable. The data from groundwater level hobo logger in GND2102 was downloaded. Data was downloaded from the atmospheric hobo logger. The data from the Solinst level logger in GND2102 was downloaded. Manual water level measurements were carried out at GND2101, GND2102 and GND2103.

2.2 Results of abstraction monitoring

As a condition of TTR's consent 7470-1.1, they are required to record the daily volumes abstracted, and the rate of abstraction. The abstraction data is captured electronically, and sent by telemetry directly to the TRC's computer system.

Consent 7470-1 (1 July 2013 - 9 June 2014) stipulates an abstraction volume limit of 170 m³/day, and a maximum abstraction rate of 10 l/s. Consent 7470-1.1 (10 June 2014 - 30 June 2014) stipulates an abstraction volume limit of 500 m³/day, and a maximum abstraction rate of 10 l/s. The maximum daily abstraction volume and rate data for the period under review are presented in Figure 2 and Figure 4. The maximum daily abstraction volume and rate data for the period Oct 2009 – June 2014 are presented in Figure 3 and Figure 5.

Figure 2 indicates that the maximum authorised abstraction rate of 170 m³/day was exceeded on thirteen occasions during the period under review. Enforcement action was undertaken by the Council in relation to this non-compliance (see Section 2.4). The maximum authorised abstraction rate of 500 m³/day was not exceeded. Figure 3 shows that most of the exceedances occurred in summer, when more groundwater would be needed to irrigate the land during the drier months.

Figure 4 indicates that the maximum authorised abstraction rate was not exceeded during the monitoring period. Figure 5 shows that the rate has not been exceeded since monitoring began at the site.

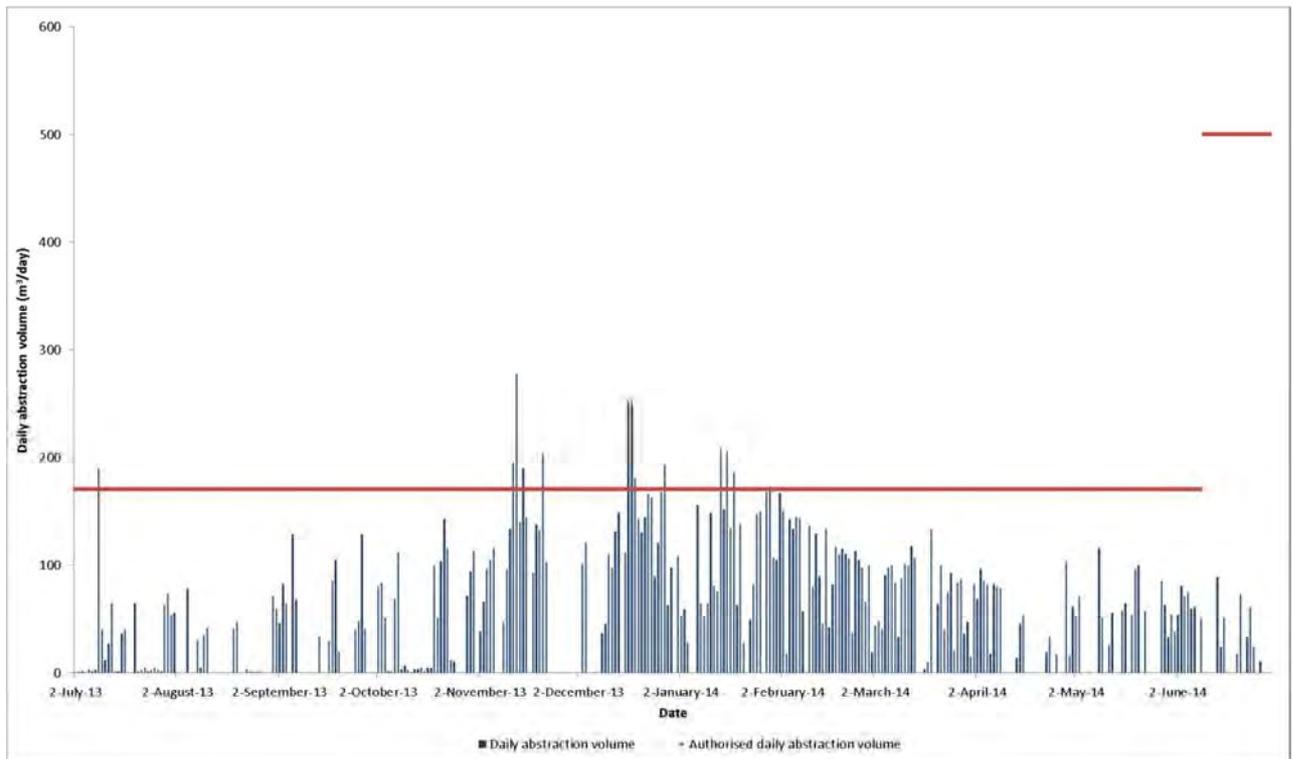


Figure 2 Daily abstraction volumes under consent 7470-1 (2009-2014)

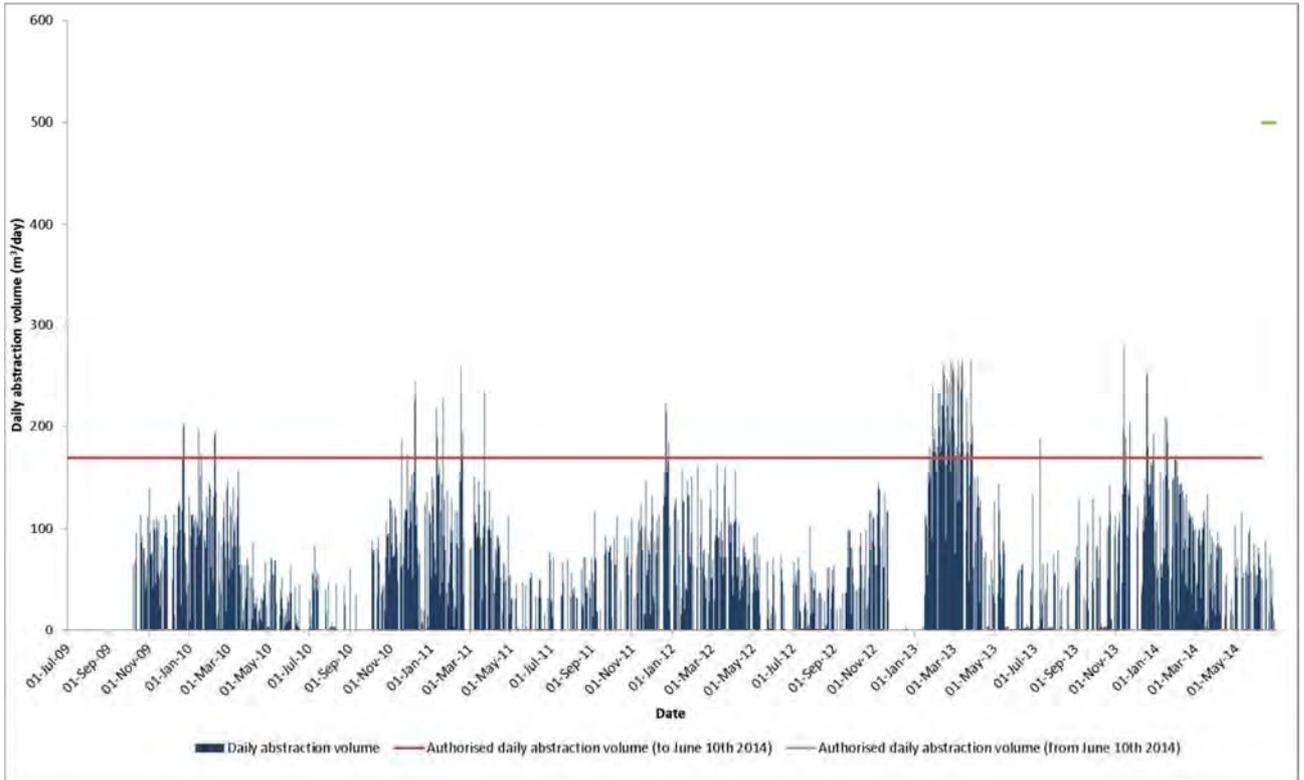


Figure 3 Daily abstraction volumes under consent 7470-1 (2009-2014)

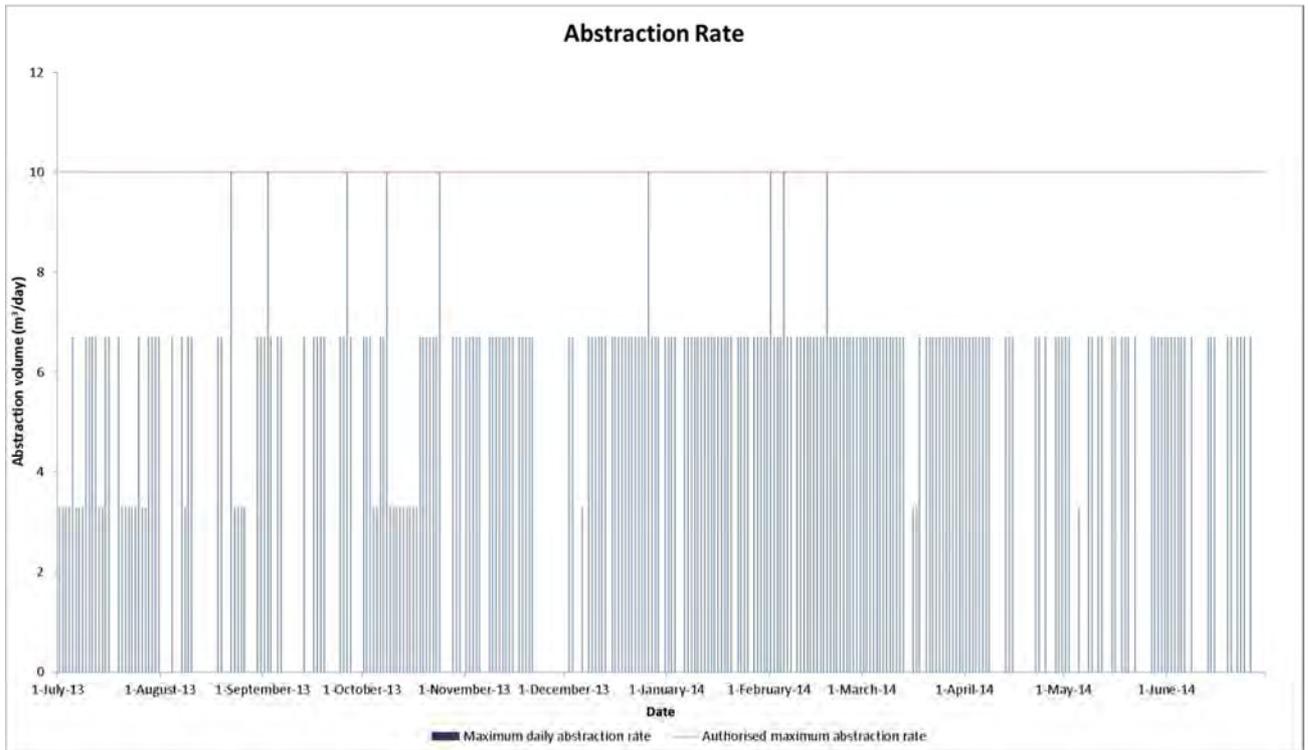


Figure 4 Maximum daily abstraction rate under consent 7470-1 (2009-2014)

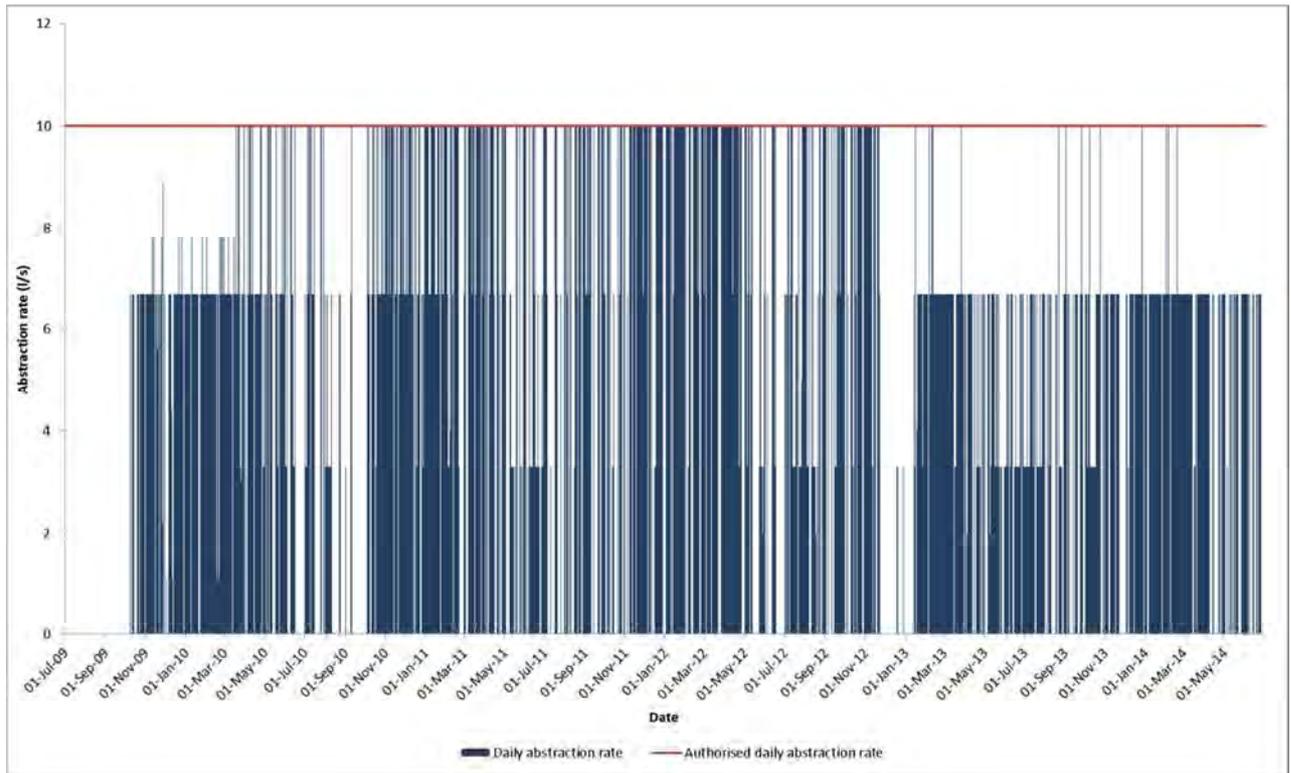


Figure 5 Maximum daily abstraction rate under consent 7470-1 (2009-2014)

2.3 Results of groundwater level monitoring

Electronic records of the water level in GND2102 and GND2103 are available for the period under review. The water level data obtained from GND2102 over the entire monitoring period is plotted in Figure 6. There are some gaps in the data record between July 2009 and June 2013 where logger memory capacity has been exceeded before being downloaded. The data is complete for the 2013-2014 monitoring period. The data is presented with the production bore abstraction data and daily rainfall values taken from the Council's Mangorei rainfall station, located approximately 3.5 km south of the site.

An issue with the data being obtained from GND2103 was discovered in mid 2013. Further investigations found that the logger had not been suspended at sufficient depth to capture the full range of water level drawdown occurring within the bore as a result of the abstraction from the production bore. On 24 October 2013 a hobo logger on a 24 m cable was removed from the well and a new solinst level logger on a 30 m cable was installed. Therefore, water level data for GND2103 is only available from 24 October 2013 onwards, as shown in Figure 7.

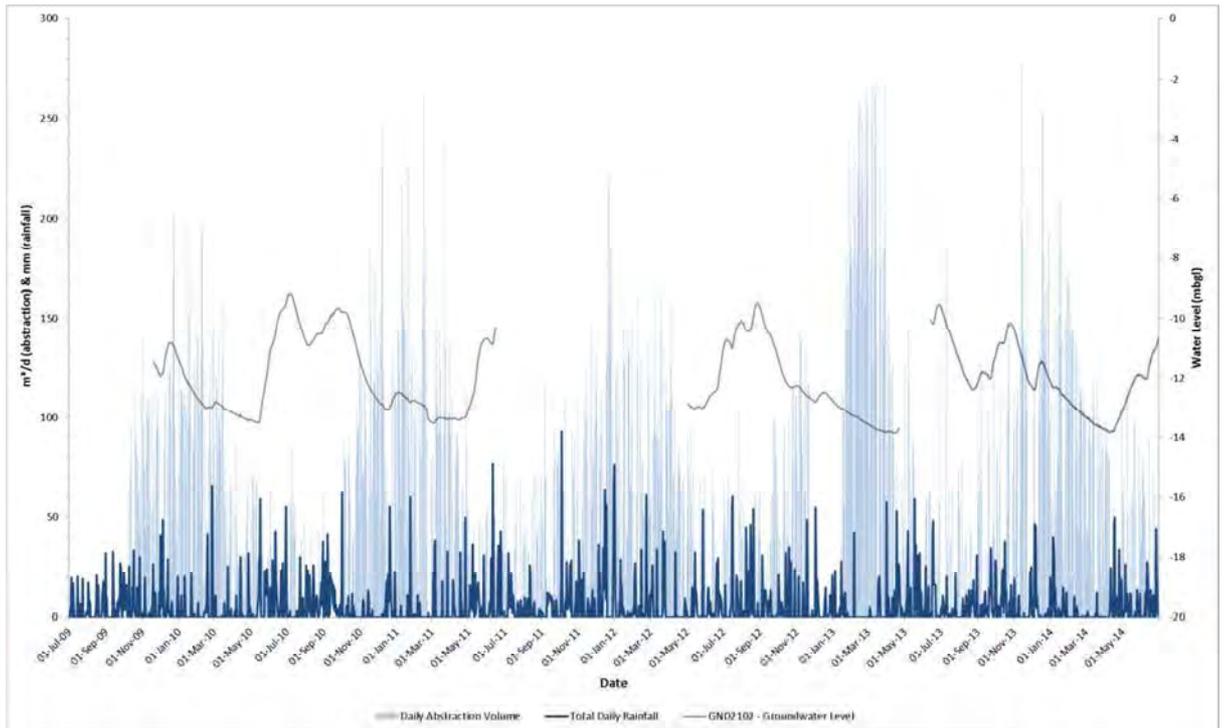


Figure 6 Observed water level in GND2102 (2009-2014)

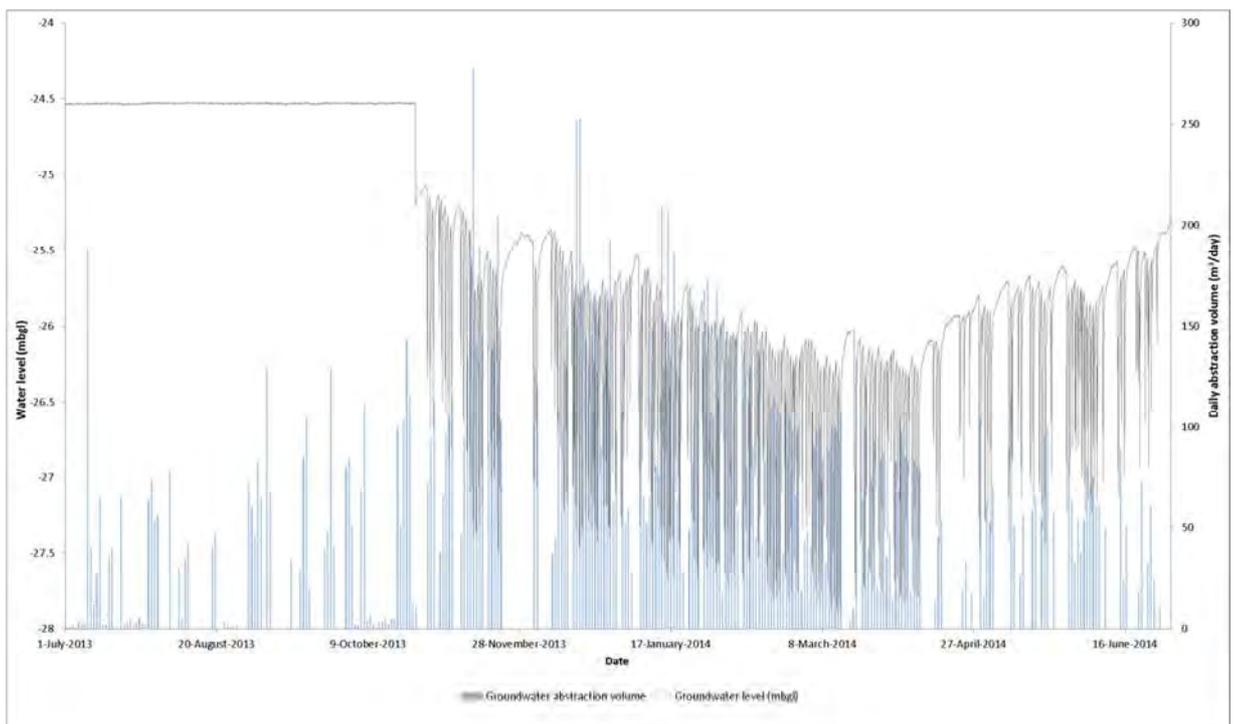


Figure 7 Observed water level in GND2103 (October 2013-June 2014)

2.4 Investigations, interventions, and incidents

The monitoring programme for the period was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. During a monitoring period, 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 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).

An incident was entered into the Council's UIR in August 2013 for consent non-compliances in relation to consent 7470-1. The non-compliances identified related to the exceedance of the maximum abstraction volume and rate authorised by consent 7470-1 during the 2012-2013 monitoring period.

On 3 September 2013, TTR was subsequently issued an Abatement Notice requesting them to take all steps necessary to comply with all conditions of consent 7470-1. Due to continued exceedances of the maximum daily abstraction volume between 11 November 2013 and 17 January 2014, the Council issued TTR with an infringement notice on 7 March 2014. Due to the repeated exceedances, TTR applied for a change of consent conditions, which was granted on 10 June 2014. This change in conditions increased the maximum daily abstraction volume from 170 m³/day to 500 m³/day. Since abstraction began in 2009, abstraction volumes have not exceeded 300 m³/day so it is highly unlikely that 500 m³/day will be exceeded.

A requirement of the both consent 7470-1 and 7470-1.1 was the supply of abstraction and groundwater level monitoring data to NPDC. Abstraction data is transmitted directly to the Council via telemetry and water level downloaded from dataloggers during inspection visits. To date, the data has not been forwarded to NPDC as required under the conditions of the consent. While the supply of such data to NPDC is ultimately the responsibility of the consent holder, the Council will in future send all data to NPDC as it is processed. All historic data is also being compiled by the Council and will be forwarded to NPDC in due course. The Council views this issue as a minor non-compliance which is a result of confusion over who was forwarding data to NPDC.

3. Discussion

3.1 Environmental effects of exercise of consents

The main potential environmental effect of a groundwater abstraction is the reduction in groundwater levels in the vicinity of the production bore. Depending on the local hydrogeological characteristics, the lowering of groundwater levels could reduce the volume of water available for abstraction by other existing groundwater users, or reduce the volume of groundwater discharge into local surface water features.

The potential effects of the abstraction authorised by consent 7470-1 and 7470-1.1 were thoroughly assessed during the processing of the consent application. Analysis of the pump test data suggests that measureable drawdown (0.1 m) would occur 500 m to 1,000 m from the production bore when operating at the maximum authorised limit. Drawdown would only occur within the aquifer from which abstraction occurs, as the aquifer is vertically confined from other water bearing formations. There are no other groundwater abstractions located within 3,000 m of the production bore and no other groundwater users are deemed to have been affected by the abstraction.

The primary concern associated with a reduction in groundwater levels as a result of the abstraction from GND2010 is therefore the reduction in groundwater flow to springs and surface water systems within Pukekura Park. The potential adverse effects of the abstraction on surface water flows within Pukekura Park were thoroughly assessed during the resource consenting process. As part of the pump testing programme carried out prior to the lodging of the consent application, a constant rate test was carried out from the production bore. The constant rate test involved pumping the bore at flow rates ranging from 8 l/s to 10 l/s for eight days. During the constant rate test, no drawdown was recorded in shallow observation bore GND2102. In fact, the water level within GND2102 increased 0.6 m from 13.5 mbgl to 12.9 mbgl as a result of rainfall recharge during the test period. The results of the pump testing carried out and the monitoring of water levels within the observation bores during testing indicated that the shallow unconfined aquifer, which is responsible for providing baseflow to surface water features in Pukekura Park, is not directly connected to the aquifer from which the abstraction occurs.

The monitoring programme implemented by the Council in respect of consent 7470-1 included a groundwater level monitoring component, designed to allow for the ongoing assessment of the effects of the abstraction on local groundwater levels and groundwater fed surface water systems.

During the period under review, groundwater levels measured within observation bore GND2102 varied between 9.62 mbgl and 13.84 mbgl. The main factor influencing groundwater level fluctuations in GND2102 is rainfall recharge volumes, with water levels displaying seasonal trends. The seasonal variation of 4.22m observed within GND2102 is typical of shallow bores screened within the volcanics formation, and it is consistent with the trend displayed during previous monitoring periods (Figure 6). A long-term record of groundwater level is available for GND0508, located on Carrington Road, New Plymouth. GND0508 is 14 m in depth and is screened within the Volcanics Formation. Monitoring records for GND0508 indicate seasonal fluctuations in groundwater levels of up to 4.85 m at this location. The seasonal variation in water

levels observed in GND2102 can therefore be considered typical of bores screened in the volcanics.

Prior to the start of the constant rate test in May 2009, the static water level in observation bore GND2102 was 12.9 mbgl. Groundwater level data gathered as part of the Council's monitoring programme indicates an average groundwater level of 13.0 mbgl during May 2010, 11.7 mbgl during May 2011, 13.0 mbgl during May 2012, 13.5 mbgl during May 2014. This data indicates that groundwater levels have remained relatively stable over the period under review, and there is no evidence of any long term reduction in shallow groundwater levels as a result of the authorised abstraction.

During the period under review, groundwater levels measured within observation bore GND2103 varied between 25.1 mbgl and 27.9 mbgl. The main factor influencing groundwater level fluctuations in GND2103 is abstraction from GND2101. Figure 7 shows that during periods of abstraction at GND2101, the water level in GND2103 decreases rapidly, and when abstraction ceases, the groundwater level in GND2103 recovers until the next abstraction event. This is to be expected, as GND2103 is screened in the same aquifer as GND2101 draws water from. Figure 7 shows that during more consistent times of pumping and pumping higher volumes, such as from mid-December to mid-March the water level in the well declines. In times of less consistent pumping and pumping at lower volumes, such as during April and May 2014, groundwater level rises again.

In summary, water level monitoring data gathered by the Council does not indicate any long-term reduction in shallow groundwater levels as a result of the abstraction authorised by consent 7470-1 and 7470-1.1. As such, the potential for adverse effects on downgradient surface water systems as a result of the abstraction is deemed negligible.

3.2 Evaluation of performance

A tabular summary of the consent holder's compliance record for the period under review is set out in Tables 1 and 2.

Table 1 Summary of performance for Consent 7470-1 to take and use groundwater from a bore for watering of racing tracks and general purposes at TTR.

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limits of discharge rates and volumes	Monitoring of take and data review	No
2. Installation of water meter and datalogger	Inspection	Yes
3. Bore label to be attached	Inspection	Yes*
4. Continuous record of water level to be maintained in observation bores GND2102 and GND2103	Inspection and assessment of monitoring data	Yes
5. Observation bore GND2104 to be accessible for NPDC staff	Inspection	Yes

6. Data collected accordance with special conditions 2 & 4 to be submitted to NPDC	Notification of data received from NPDC	No**
7. All electronic records to be made available to the Chief Executive, Taranaki Regional Council	Receipt of electronic data at required frequency and in correct format	Yes
8. Adopt best practicable option	Inspection and liaison with consent holder	Yes
9. Lapse clause	Consent exercised prior to 30 September 2014	Yes
10. Review provision	Next option to review in June 2014	N/A
Overall assessment of environmental performance and compliance in respect of this consent		Improvement required
Overall assessment of administrative performance and compliance in respect of this consent		Good

* On 11 March 2014 the label for GND2102 was found to be faded and unreadable. It was suggested that this be replaced with a new label.

** Data available from the Council on request and will be forwarded to NPDC

Between 1 July 2013 and 9 June 2014, TTR demonstrated an improvement level of environmental performance and compliance and a good level of administrative performance and compliance with resource consent 7470-1 (as defined in Section 1.1.4).

Table 2 Summary of performance for Consent 7470-1.1 to take and use groundwater from a bore for watering of racing tracks and general purposes at TTR.

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limits of discharge rates and volumes	Monitoring of take and data review	Yes
2. Installation of water meter and datalogger	Inspection	Yes
3. Measurements made in accordance with condition 2 shall be transmitted to the Council's computer system in real time	Receipt of electronic data at required frequency and in correct format	Yes
4. Bore label to be attached	Inspection	Yes
5. Continuous record of water level to be maintained in observation bores GND2102 and GND2103	Inspection and assessment of monitoring data	Yes
6. Observation bore GND2104 to be accessible for NPDC staff	Inspection	Yes
7. Data collected accordance with special conditions 2 & 5 to be submitted to NPDC	Notification of data received from NPDC	No*
8. Adopt best practicable option	Inspection and liaison with consent holder	Yes
9. Lapse clause	Consent exercised prior to 30 September 2014	Yes

10. Review provision	Next option to review in June 2014	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance and compliance in respect of this consent		Good

* Data available from the Council on request and will be forwarded to NPDC

Between 10 June and 30 June 2014, TTR demonstrated a high level of environmental performance and compliance and a good level of administrative performance and compliance with resource consent 7470-1.1 (as defined in Section 1.1.4).

3.3 Recommendations from the previous monitoring report

1. THAT monitoring of consent 7470-1 in the 2013-2014 year continues at the same level as in the 2009-2013 period.

This recommendation was implemented, with the monitoring from the 2009-2013 monitoring period carrying through to the 2013-2014 monitoring period.

2. THAT the consent holder ensures that they limit their daily abstraction volume to that authorised by consent 7470-1 (170 m³/d).

TTR exceeded the maximum daily abstraction volume on thirteen occasions during the 2013-2014 monitoring period. The conditions of consent 7470-1 were changed on 10 June 2014 which increased the maximum daily abstraction volume from 170 m³/day to 500 m³/day.

3. THAT the telemetry system being trialled at the site is installed permanently during the forthcoming monitoring period. This will enable abstraction data to be monitored in real-time by both the Council and the consent holder, allowing potential non-compliance issues to be identified and avoided.

This recommendation was implemented, and a telemetry device was installed on the data logger in GND2010 on 25 September 2013.

4. THAT the optional review of consent 7470-1 not be exercised on the grounds that current consent conditions are adequate to deal with any adverse effects on the environment arising from the exercise of the consent.

On 10 June 2014, consent 7470-1 was amended to 7470-1.1. The conditions of the consent were updated to increase the maximum daily abstraction volume from 170 m³/day to 500 m³/day, as TTR had exceeded the original maximum volume limit on multiple occasions.

3.4 Alterations to monitoring programmes for 2013-2014

In designing and implementing the monitoring programmes for the use of natural resources 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, the obligations of the RMA in terms of monitoring emissions/ discharges and effects, and subsequently reporting to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and

the need to maintain a sound understanding of industrial processes within Taranaki emitting to the atmosphere/ discharging to the environment.

It is proposed that the current level of monitoring be continued during the forthcoming 2014-2015 period. A recommendation to this effect is attached to this report.

3.5 Exercise of optional review of consent

Resource consent 7470-1.1 provides for an optional review of the consent in June 2015.

Based on the results of monitoring in the period under review, it is considered that there are no grounds that require a review to be pursued or grounds to exercise the review option.

A recommendation to this effect is presented in Section 4 of this report.

4. Recommendations

1. THAT monitoring of consent 7470-1.1 in the 2014-2015 year continues at the same level as in the 2013-2014 period.
2. THAT the consent holder ensures that they limit their daily abstraction volume to that authorised by consent 7470-1.1 (500 m³/day).
3. THAT the optional review of consent 7470-1.1 not be exercised on the grounds that current consent conditions are adequate to deal with any adverse effects on the environment arising from the exercise of the consent.
4. THAT the data required by condition 2 and condition 5 in consent 7470-1.1 is provided to the New Plymouth District Council at intervals not exceeding three months, as per condition 7 in the consent.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

Drawdown	A lowering of the water level in a reservoir or other body of water.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident
l/s	Litres per second.
m ³ /d	Cubic metres per day.
Observation bore	A bore drilled in a selected location for the purpose of observing parameters such as fluid levels and pressure changes as production proceeds.
Production bore	A well used to retrieve groundwater from an aquifer for the purposes of water supply for consumptive or irrigation purposes.
Pump test	A pump test (or aquifer test) is conducted to evaluate an aquifer by stimulating the aquifer through constant pumping, and observing the aquifer's response (drawdown) in observation bores. Aquifer testing is a common tool that hydrogeologists use to characterise aquifer systems and determine aquifer properties.
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 including all subsequent amendments.
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.

Bibliography and references

- BECA (2009): Taranaki Thoroughbred Racing Groundwater Well. Technical Report. TRC doc.621284
- Geosearch Limited (2014) Assessment of effect for application to change the conditions of consent 7470
- Stevens G. 2001. Taranaki : *In: Groundwaters of New Zealand*, M.R, Rosen and P.A. White (eds). New Zealand Hydrological Society Inc., Wellington. P381-386.
- Taranaki Regional Council (2009): Officers Report – Consent Application 7470-1. TRC doc. 621297
- Taranaki Regional Council (2013): Officers Report – Consent Application 7470-1.1. TRC doc. 1352092
- Taranaki Regional Council (2014) Taranaki Racing Club Groundwater Abstraction Monitoring Programme Report 2009-2013. Technical Report 2013-71

Appendix I

Resource consents held by Taranaki Thoroughbred Racing

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

Name of
Consent Holder: Taranaki Racing Club
P O Box 453
NEW PLYMOUTH 4340

Consent Granted
Date: 20 August 2009

Conditions of Consent

Consent Granted: To take and use groundwater from a bore for watering of racing tracks and general purposes at the Taranaki Racing Club at or about (NZTM) 1693946E-5675085N

Expiry Date: 1 June 2020

Review Date(s): June 2014 and/or within two months of receiving one year of water level monitoring data

Site Location: 130 Coronation Ave, New Plymouth

Legal Description: Pt Lot 1 DP 9521

Catchment: Te Henui

Consent 7470-1

General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
 - i) the administration, monitoring and supervision of this consent; and
 - ii) charges authorised by regulations.

Special conditions

1. The volume of groundwater taken shall not exceed 170 cubic metres per day at a rate not exceeding 10 litres per second.
2. Before exercising this consent the consent holder shall install, and thereafter maintain, a water meter and a datalogger. The water meter and a datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of $\pm 5\%$.
3. The bore shall be easily identifiable by a permanent label, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The numbering on the label shall be the bore number assigned by Taranaki Regional Council, which is GND2010.
4. The consent holder shall ensure that a continuous record of the groundwater level in a shallow and deep groundwater observation wells GND2102 [the Council-PMB1] and GND2103 [the Council-PMB2] is kept for the first year of the exercise of the consent. This shall be achieved by installing an automatic water level recording device on each well that records the water level at intervals not exceeding 30 minutes to an accuracy of ± 5 mm and is tamper-proof. The cost of establishing and operating the recorder shall be met by the consent holder.
5. Observation borehole GND2104 [the Council-PMB3] shall be kept accessible for New Plymouth District Council to monitor for the first year that this consent is exercised.
6. Water level data collected in accordance with condition 4 above, and records of water taken collected in accordance with condition 2, shall be provided to New Plymouth District Council at intervals not exceeding three months.
7. The consent holder shall make available electronic records of water taken to the Council at a frequency and in a format to be advised by the Chief Executive, Taranaki Regional Council.

Consent 7470-1

8. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including, but not limited to, the efficient and conservative use of water.
9. This consent shall lapse on 30 September 2014, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review:
 - a. Within two months of the Council receiving one year of water level monitoring data; and/or
 - b. during the month June 2014

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 20 August 2009

For and on behalf of
Taranaki Regional Council

Director-Resource Management

