



BEFORE

An Independent Commissioner
appointed by Tasman District Council

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of an application by CJ Industries Ltd
for land use consent RM200488 for
gravel extraction and associated site
rehabilitation and amenity planting and
for land use consent RM200489 to
establish and use vehicle access on an
unformed legal road and erect
associated signage

**EVIDENCE OF TIMOTHY GEORGE CORRIE-JOHNSTON
ON BEHALF OF CJ INDUSTRIES LIMITED
(CORPORATE AND OPERATIONS)**

15 July 2022

1. INTRODUCTION

- 1.1 My full name is Timothy George Corrie-Johnstone.
- 1.2 I am Site Manager for CJ Industries’ operations base at Hau Road and for all of CJ Industries’ quarries (two at Riwaka, one at Marahau, and Douglas Road, Motueka). If this application is consented I will be site manager for the Peach Island Quarry. I am authorised to provide this evidence on behalf of the applicant, CJ Industries Ltd.
- 1.3 I have been managing the aggregate side of the business for the last 6 years and have worked in the industry for 16 years. I hold the following relevant qualifications:
 - (a) A B Grade Quarry Manager Certificate. The B Grade Quarry Manager’s Certificate covers a wide range of matters including knowledge of regulatory requirements to manage an extractive site, preparation of a

safety plan for extractive operations, safety checks and management and use of water.

(b) I hold a National Certificate in Extractive Industries, a National Certificate in Concrete Production (Level 3), National Certificate in Concrete Cores Skills.

(c) I hold a Class 5 drivers license.

1.4 I live onsite at 134 Peach Island Road with my family. I purchased the property in 2019. I have a drinking water bore on my property.

1.5 My evidence addresses the aggregate resource, and operational aspects of the activities for which consent is sought.

1.6 My evidence will include:

(a) Uses of aggregate

(b) Anticipated aggregate yield

(c) Aggregate availability

(d) Operations

1.7 I attach a copy of the draft Groundwater and Clean Fill Management Plan that has been produced by PDP.

2. EXECUTIVE SUMMARY

2.1 River run aggregate is a finite resource that is essential for high value end products – concrete and sealing chip – that have a wide range of uses in community, industrial, and infrastructure developments in the region. Aggregate from Peach Island is necessary for CJ Industries to meet demand for concrete and sealing chip.

2.2 There are limited sources of river run aggregate available in the Motueka area. The demand cannot be met from rivers alone, and other rock cannot be substituted.

2.3 The amount of aggregate that can be extracted from the Peach Island site is between 400,000 and 550,000 tonnes.

- 2.4 It is very expensive to bring aggregate from outside the region, and generally the quality is lower than Motueka river run. It is not economical to supply local concrete and sealing chip demand using imported product. There is also a large impact in terms of carbon emissions because of the weight of the product and the fuel involved in transporting it. If local product cannot be sourced, the cost of concrete will go up significantly which will presumably have knock on effects for construction and other end users.
- 2.5 CJ Industries and related concrete and civil construction businesses reliant on the aggregate source employ 90 people.
- 2.6 I describe relevant aspects of how the Peach Island quarry will operate. My evidence covers:
- (a) site preparation;
 - (b) the extraction methodology;
 - (c) operating hours;
 - (d) pre-start checks;
 - (e) vehicles;
 - (f) water for dust suppression; and
 - (g) sources of clean fill.
- 2.7 A 15 year consent term is longer than the time required to extract that amount of aggregate from Peach Island, but enables CJ Industries to use the region's finite aggregate resources more efficiently, by preferentially using river aggregate sources when these are made available by Council. There is no certainty as to when river aggregate sources will be available or the volume.
- 2.8 I describe how CJ Industries will ensure compliance with resource consent conditions and management plans, in particular where relevant to dust, clean fill properties, groundwater quality, traffic and noise.

2.9 I provide a response to submitters' comments on start times, compliance, how complaints will be dealt with, and development of an off-road section of the Great Taste Trail. I provide a response to the s 42A report in relation to "functional need", backfill quality, and consent term.

3. EVIDENCE

Uses of aggregate

3.1 The product to be extracted is river gravel, made up of a range of sizes from approximately 300 mm to fine sands. It is required for use in concrete manufacturing, due to its hardness. A small proportion of the product also gets used in sealing chip. It is highly valued for these uses, as river gravel is one of the few rock sources that can be used to make concrete and sealing chip to meet NZ specifications (M06 Sealing Chip Specifications 2019).

3.2 CJ Industries produces sealing chip and Motueka Pre-Mix, a division of CJ Industries, produces the concrete product. The concrete is used in house builds, factories, sheds, driveways, marae, community facilities, infrastructure, and any other use where concrete is required. Concrete is used in the civil construction division, and is sold to contractors in Tasman. Some of the sealing chip is also used in CJ's civil construction division, and some is sold to external customers in the Tasman district.

3.3 CJ Industries requires approximately 6 – 8,000 tonnes of river run per month to supply current demand for these products.

3.4 CJ Industries and associated concrete and civil construction businesses reliant on the aggregate source employ 90 people.

Anticipated aggregate yield

3.5 The amount of aggregate that can be extracted from the Peach Island site is between 400,000 and 550,000 tonnes.

3.6 Anticipated aggregate volume is assessed based on:

$$\text{Area} \times (\text{extraction depth} - \text{topsoil} + \text{subsoil depth}) = \text{volume in m}^3$$

volume m³ x 2.2 = mass in tonnes

3.7 The yield requires some assumptions:

- (a) The excavation depth is estimated on the basis of recommendations from Mr Nicol in relation to groundwater protection.
- (b) The depth of topsoil and subsoil will vary between 0.5 and 1 m. This assessment uses 0.75 m, which is a reasonable estimate of the average.

Aggregate availability

- 3.8 River run aggregate can only be sourced from current or former river beds. While former river beds are relatively widespread, there are many constraints on accessing the resource including proximity to built up residential areas, areas currently being used for high value horticultural products, and environmental constraints (e.g. wetlands).
- 3.9 Availability of aggregate from flowing rivers is determined by Council surveys as part of Council's flood prevention programme. Aggregate lifts the river bed height, making the river shallower, which creates a risk of flooding. Council therefore carries out surveys to see how much aggregate needs to be removed to manage the flood risk.
- 3.10 Council surveys approximately every four years. Aggregate suppliers like CJ Industries can ask Council for access to a portion of this resource. Council decides who gets access and quantity. Council holds a global resource consent for gravel extraction. When CJ Industries is given access to this source, it is required to comply with Council's resource consent conditions. CJ Industries pays Council for the resource.
- 3.11 The table below sets out the amount of aggregate that CJ Industries has been authorised to extract from Tasman Rivers since 2019:

History TDC River Gravel Supply

Date	Qty m3		Conversion Factor	Tons
11/06/2019	2,500	Upper Motueka		
12/06/2019	3,500	Upper Motueka		
10/07/2019	2,613	Pearce Lower		
27/09/2019	2,000	Motueka		

11/11/2019	4,677	Lower Motueka		
2019 Total	15,290		2.2	33,638
20/05/2020	900	Upper Motueka		
13/08/2020	3,507	Upper Motueka		
9/12/2020	1,000	Upper Motueka		
2020 Total	5,407		2.2	11,895
20/10/2021	4,351	Lower Motueka		
20/10/2021	6,178	Lower Motueka		
2021	10,529		2.2	23,164

- 3.12 Council has had a survey of the Motueka River completed earlier this year. It showed there is 44,000 m³ that may need to be extracted. Council has not committed to allocating all of this. There is no guarantee that Council will allocate this amount, or what proportion CJ Industries will be allocated.
- 3.13 Generally, comparatively large volumes of aggregate can be sourced from the Waimea River, so there is less need for aggregate suppliers to have pit quarries to meet demand in and around the Richmond area. CJ Industries occasionally sources a small quantity of Waimea gravel from a Waimea aggregate supplier. That said, no aggregate supplier in Waimea is currently able to commit to supplying CJ Industries' river run demand. Council has also agreed that CJ Industries can access a small volume from Waimea River (5000 m³, which is about a month's demand). The Waimea River aggregate is a weaker gravel and not ideal for our ready mix. It can only be used by blending it with local river run.
- 3.14 As I have set out above, the demand for aggregate for high value end uses (concrete and sealing chip) cannot be met:
- (a) through other sources of rock; or
 - (b) through river aggregate. The amount of aggregate available from flowing river sources is a very small proportion of the amount required.

- 3.15 It is very expensive to bring aggregate from outside the region, and generally the quality is lower than Motueka river run. It is not economical to supply local concrete and sealing chip demand using imported product. There is also a large impact in terms of carbon emissions because of the weight of the product and the fuel involved in transporting it.
- 3.16 If local product cannot be sourced, the cost of concrete will go up significantly which will presumably have knock on effects for construction and other end users, including Council projects.

Operations

Site preparation

- 3.17 Prior to any extraction occurring, neighbouring boundaries and setbacks from features such as stopbanks are measured and marked out.
- 3.18 There are also daily pre-start checks such as water level depth which I discuss below.

Extraction methodology

- 3.19 Below I explain the extraction methodology.
- 3.20 There are three proposed stages. Stage 1 is to the west of the stopbank. Stage 2 is within the stopbank, to the west of the paper road. Stage 3 is within the stopbank to the east of the paper road. These areas are shown in **Figure 1**. Initially CJ Industries had proposed to start with Stage 1 then move to Stages 2 then 3. Based on advice from Ms Gavin, CJ Industries now proposes to start with Stages 2 and 3 to allow mitigation planting to establish before Stage 1 works start. Based on Mr Bluett's advice, CJ Industries would not quarry within 100 m of horticultural activities between January and May. This means moving between Stages 2 and 3 at different times of year.

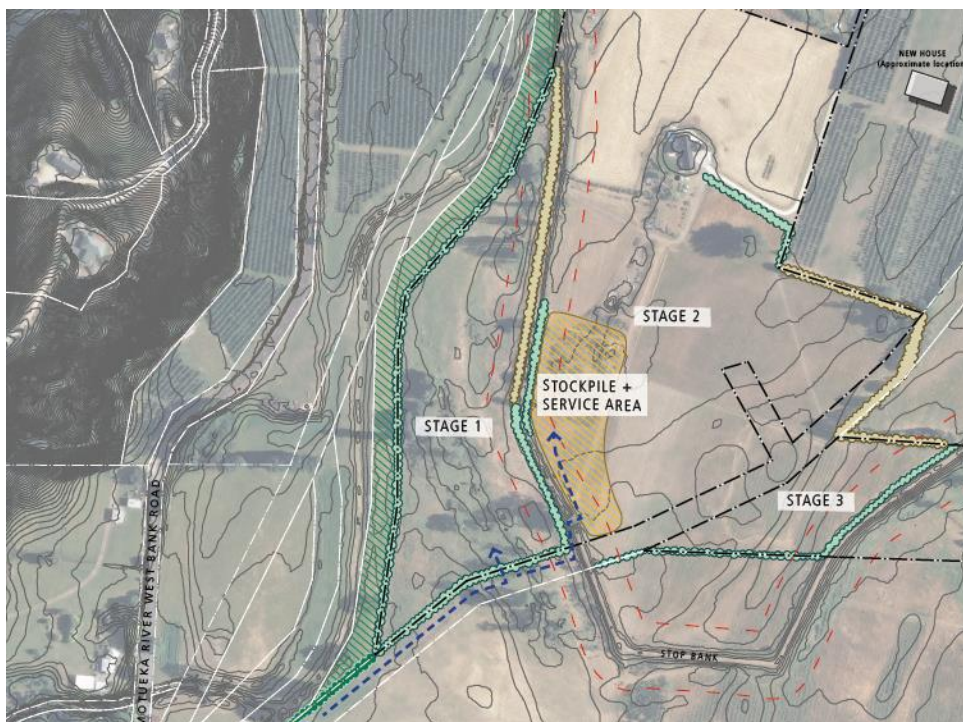


Figure 1: Stages

- 3.21 Topsoil and subsoil will be removed from extraction area for the day and stockpiled. For Stage 1, the only topsoil that will remain in the Stage 1 area is that required for the day's rehabilitation. All other Stage 1 topsoil will be stored on the landward side of the stopbanks.
- 3.22 Aggregate will then be extracted using an excavator, and carted from the burrow by dump trucks.
- 3.23 The aggregate will be stockpiled in a Stockpile and Service area located behind the stopbank, as shown in **Figure 1**. The base of the stockpile will be 1m below ground level. The maximum height will be 4 m (so 3 m above surrounding ground).
- 3.24 Clean fill will also be stockpiled in the Stockpile and Service Area. As the dump truck returns to the extraction site from the stockpile, it will bring clean fill from the stockpile to be used for reinstatement of the extraction site.
- 3.25 At the end of each day, clean fill will replace extracted material so that by the end of each day the pit size will be no greater than 1600m², i.e. 20 x 80m, though the shape may vary from time to time. In this way the extraction site will move daily.
- 3.26 Mr Nicol has recommended that to protect groundwater the extraction should be:

- (a) To no less than 0.3 m above groundwater level with a requirement that the area of the pit where the deeper extraction has occurred is backfilled with clean fill on the same day.
- (b) Otherwise at least 1 m above groundwater at the time of the excavation, in which case the excavation can be backfilled when extraction in that area of the excavation has ceased.
- (c) All excavations to depths between 1 m and 0.3 m above groundwater level will be undertaken during dry weather conditions.

- 3.27 To achieve this, at the end of each day that extraction is happening the burrow floor will be raised to 1 m above water level using clean fill. If the weather is not dry, CJ Industries would not dig any closer than 1 m above groundwater level.
- 3.28 That requires CJ Industries to know what the water level is. The Site Manager (me) will check water level on the data loggers, and enter the levels into the excavator GPS. This means the excavator operator will know the exact depth that they cannot go beyond. The GPS will also record the actual depth of excavation and this information will be made available to Council.
- 3.29 It is likely that a burrow would be extracted and re-established within a month. If a source becomes available from elsewhere (e.g. through Council's global river consent), a burrow may be left open for longer, but not for more than six months.
- 3.30 It is envisaged that extraction, carting to the stockpile and the return of fill would only need to take place around one week each month on average.
- 3.31 The stockpiled aggregate will be loaded onto truck and trailers using a loader. CJ Industries had initially proposed to use an excavator to load the trucks, but a loader has almost three times the capacity of an excavator so will require fewer buckets to load. The loader will also be used to load clean fill from the stockpile onto the dump truck for extraction site reinstatement.
- 3.32 Removal of material from the stockpile (refer blue dashes on **Figure 1**) would happen using truck and trailer units with sound deadening deck liners in place. These trucks will

generally back load clean fill to minimise truck movements (unless there is already a full stockpile of clean fill on the site). I describe the clean fill sources below.

- 3.33 While it is not part of the application, I can also explain for context that extracted product is transported to CJ Industries' Hau Road site, where it is screened, crushed, washed and graded. The river run that is 20 mm or below is screened and washed, and everything above 20 mm is crushed to 20 mm size. The material is then stockpiled until it is needed for concrete production or sealing chip use. Those products are produced at the Hau Road site.

Operating hours

- 3.34 The application stated that operating hours would be 7am to 5 pm on Monday - Friday.
- 3.35 After considering submissions on this, CJ Industries proposes to include a condition that no heavy machinery (excavator, dump trucks, bulldozer, loader) is started and no extraction or backfilling occurs before 7.30 am. The only activity that would be happening from 7 am to 7.30 would be staff arriving on site plus pre-start checks and safety checks.

Pre-start checks

- 3.36 Pre-start checks will include:
- (a) Checking groundwater levels and programming excavator GPSs.
 - (b) Windspeed checks. Heavy machinery operations (excavation, loading, backfilling, transporting aggregate or clean fill) will not occur if wind speed is higher than 27 km/h.
 - (c) Rain forecast, to ensure that site is prepared for a weather event.

Vehicles

- 3.37 A speed limit of 15 km is proposed within the site. From an operational perspective, I would not expect vehicles to travel any faster than 20 km/h anyway, so a 15 km/h limit is easily achievable.

- 3.38 No heavy vehicle maintenance apart from servicing (e.g. an oil change by trained personnel) would occur at the Peach Island site. An example of heavy vehicle maintenance is engineering maintenance, such as work on a digger bucket.
- 3.39 Refuelling occurs at the end of each day, using a ute with a fuel tank or towing trailer with a fuel tank which transports the fuel to the heavy machinery.

Heavy machinery will be parked close to where they are used (burrows or stockpiles) when not in use. There will be a dedicated parking area for utes close to the stockpile. Fuel trailers will be kept in a bunded area. If heavy rain is forecast, all machinery will be moved inside the stopbank.

Water for dust suppression

- 3.40 I hold a water permit (RM171337) for the take and use of water for irrigation at 134 Peach Island Road. An application has been lodged to vary the application, to enable water to be used for irrigation and/or for dust suppression and is being considered by Council. I have authorised CJ Industries to use this water in accordance with the conditions of the permit.

Sources of clean fill

- 3.41 The nature of backfill to be used at Peach Island has changed over the course of this application. Originally, the intention was to use hard fill including up to 10 % organic material. Due to concerns raised in submissions and advice from Mr Nicol, CJ Industries will use only clean fill that meets the WasteMINZ standard. Material such as concrete will not be used. A very low organic matter limit will apply (2% incidental organic matter). Compliance with clean fill quality requirements is discussed below.
- 3.42 The sources of clean fill for Peach Island reinstatement would include:
- (a) Rock and overburden from CJ Industries Riwaka Quarry.
 - (b) Cuttings from road construction.
 - (c) Cuttings removed from land during subdivisions.
 - (d) Slip materials.

3.43 I do not expect there to be any difficulty in sourcing clean fill from those sources that meets the WasteMINZ standards. Backfill used by CJ Industries has not previously met the WasteMINZ clean fill standard - not because of a lack of suitable clean fill, but because the WasteMINZ Guidelines post-date previous quarries, and CJ Industries has not previously been asked to meet a clean fill standard by its technical advisors or the Council, and so this has not previously been a resource consent requirement.

Consent Term

3.44 In this part I explain why a 15 year consent term has been applied for. The consent duration is not based on the minimum length of time to extract the resource. Aggregate is a bulky product and the capacity to store it is limited. The rate at which it is extracted therefore needs to roughly match demand/use of the product.

3.45 If CJ Industries had no other sources of gravel, it could use all of the gravel from Peach Island in around 5 - 7 years, which means it could extract it all in 5 - 7 years. However, it would then need to look for another extraction site to meet demand for concrete and chip seal products. CJ Industries would prefer to have the flexibility to use other sources of aggregate if and when they become available (such as the river gravels discussed above). CJ Industries cannot predict when this river source will be available or what volume, so this approach seems to me to be the most efficient way to optimise use of the region's gravel resources.

3.46 If those sources become available, this would slow down the rate at which Peach Island is quarried, because of limitations in capacity to store the aggregate. There is capacity at Hau Road for about 10,000 tonnes (or approximately 2 months' supply). The stockpile at Peach Island will also store around 10,000 tonnes.

3.47 A shorter consent duration is also likely to mean more extraction activity on site. With a 15 year term, CJ Industries anticipates extracting aggregate around one week per month *on average* (sometimes more, sometimes less). Some months no extraction will occur, although there may be vehicles taking material from stockpiles when extraction is not happening.

3.48 For these reasons, I consider that a 15 year duration is appropriate.

Methods to ensure compliance with consent conditions

- 3.49 As Quarry Manager for the Peach Island quarry, I would have the primary responsibility for ensuring compliance with conditions and management plans.
- 3.50 CJ Industries has developed a new position for an Environmental and Consents Officer (“ECO”), and is presently recruiting for this role. The ECO role will include auditing resource consent compliance and reporting to company directors and Council. The ECO will also have health and safety and complaint response roles, as discussed below.
- 3.51 CJ Industries has developed a range of Standard Operating Procedures (SOPs) which reflect the resource consent and Management Plan conditions. These are currently in draft but would be updated to reflect the final conditions and Management Plans if consent is granted. These SOPs will then be made available to all staff working at the Peach Island site, and compliance with the SOPs will be an employment requirement.
- 3.52 Clean fill quality will be controlled through the following methods:
- (a) Clean fill will be brought to Hau Road, where it will be inspected visually and additional testing as specified in the Groundwater and Clean fill Management Plan carried out.
 - (b) CJ Industries has criteria in place that control who it will accept clean fill from. Only approved third parties will be allowed to deposit clean fill.
 - (c) CJ Industries will require third parties who are providing clean fill to provide a full declaration of the source (location and material) and that the material meets the WasteMINZ criteria.
- 3.53 CJ Industries accepts greenfill from a greenfill transfer station at a local landscape yard where locals can drop off their greenwaste. It mixes this greenwaste with other fill (as authorised by current consent conditions for other sites) to use as backfill. This greenfill source will not be used at Peach Island.
- 3.54 Water level loggers and programmable GPS on excavators will be used to ensure compliance with extraction depth requirements, and that information will be downloaded and provided to council as part of reporting requirements.

Groundwater and Clean Fill Management Plan

- 3.55 I attach the draft Groundwater and Clean Fill Management Plan prepared by PDP for the Peach Island Site. I have had input into the GMP from an operations perspective (to make sure it is clear for operators and practical to comply with).

Matters raised in submissions

- 3.56 Some submitters raised the issue of start times. As discussed above, CJ Industries proposes not to operate heavy machinery or carry out excavation or clean fill reinstatement before 7.30 am.
- 3.57 Some submitters refer to concerns about compliance. I have described above the measures that CJ Industries will implement to ensure it is fully compliant. I consider these are quite a major step up from the way in which previous quarry operations have been run. This includes the extent to which fill quality is controlled. At Douglas Road site, fill providers have been able to enter the site to directly deposit fill. This will not occur at Peach Island.
- 3.58 A related issue is how complaints are dealt with. Receiving and responding to complaints will become the role of the ECO (once appointed). This will provide a clear point of contact for residents and others who have feedback or complaints, and effective management of issues raised.
- 3.59 Some submitters have referred to effects of trucks on the Great Taste Trail. The Great Taste Trail Trust did not oppose the application but said that there is no off road option for riders on Motueka River West Bank Road, and asked that CJ Industries support the development of an off-road trail section.
- 3.60 CJ Industries was happy to work with the Trust on developing an off-road trail section between the site and Alexandra Bridge by providing funding. Development of an off-road route would require the support of landowners. I understand that the Trust has approached several landowners whose' permission would be required, but that their permission has not been forthcoming to date. I understand that the Trust will continue to work with landowners to see if an off-road route can be achieved. Submitters' comments on safety of Great Taste Trail users are addressed by Mr Clark.

Matters raised in s 42A report

- 3.61 The s 42A report says that the proposed quarry does not have a “functional need” to be in this location (at 12.7). I am advised that “functional need” means the need “for a proposal or activity to traverse, locate or operate in a particular environment because the activity can only occur in that environment”. I confirm that extraction of river run aggregate for concrete and sealing chip production can only occur in former or current riverbeds, and so I consider that the quarry has a functional need for the quarry in this location.
- 3.62 The 42A report invites CJ Industries to detail how it will ensure that the backfill material does not contain any contaminated material. I have addressed this above (noting that the backfill parameters have also changed since the s 42A report was produced).
- 3.63 The s 42A report discusses consent term (Part 14). This is addressed above.

4. CONCLUSION

- 4.1 There are limited sources of river run aggregate available in the Motueka area. This resource is essential for high value end products – concrete and sealing chip – that have a wide range of uses in community, industrial, and infrastructure developments in the region. Aggregate from Peach Island is necessary for CJ Industries to meet demand for those products.
- 4.2 A 15 year consent term is longer than the time required to extract aggregate from Peach Island, but enables CJ Industries to use the region’s finite aggregate resources more efficiently, by preferentially using river sources when these are made available by Council. There is no certainty as to when river aggregate sources will be available or the volume.
- 4.3 I have described relevant aspects of how the Peach Island quarry will operate, and how CJ Industries will ensure compliance with resource consent conditions and management plans, in particular where relevant to dust, clean fill properties, groundwater quality, traffic and noise.

Tim Corrie-Johnston

15 July 2022

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Peach Island Proposed Quarry: Groundwater and Clean Fill Management Plan

• Prepared for

CJ Industries

• 14 July 2022

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CJ INDUSTRIES - PEACH ISLAND PROPOSED QUARRY: GROUNDWATER AND CLEAN FILL MANAGEMENT PLAN

Quality Control Sheet

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DOCUMENT CONTRIBUTORS

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Limitations:

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by CJ Industries and others (not directly contracted by PDP for the work), including Tasman District Council. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

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1.0 Introduction and purpose

This report sets out the measures and procedures to manage the excavation of gravel aggregate by CJ industries (the “quarry operator”) at their proposed Peach Island quarry site (the “Quarry site”) and backfilling of the excavations with clean fill material, as authorised by consent RMXXXXXX.

Exposed groundwater within open excavations is susceptible to contamination. To reduce the risk of contamination, it is important that the gravel extraction pit does not become inundated with groundwater. This will be managed by maintaining at least 1 m of material between base of the working gravel extraction pit and the highest measured groundwater level at the time of the excavation. However, deeper excavations to no less than 0.3 m above groundwater level can occur as long as these deeper excavations are backfilled on the same day as extraction. This means that during periods of low groundwater levels, the pit floor will be at a deeper elevation than during periods of high groundwater levels although a separation of 1 m will always be maintained to avoid exposing groundwater within the pit. All excavations to depths between 1 m and 0.3 m above groundwater level will only occur during dry weather conditions.

Given that the excavation depths will vary depending on groundwater level conditions at the quarry site, it is expected that material used to back fill areas of the quarry excavated during periods of low groundwater levels will become inundated by groundwater during periods of high groundwater levels. Therefore, it is important that suitable controls are placed on the material being used to back fill the excavation pits to avoid contamination of shallow groundwater. Furthermore, procedures and mitigation measures are also required to reduce the risk of accidental discharges within the excavation pit (i.e., spills, etc.) as well as mitigation measures that will be implemented should any changes in groundwater quality occur as a result of the quarrying activities.

2.0 Consent compliance and key performance indicators

The overall purpose of the groundwater and clean fill management plan is to ensure that the Quarry site will be managed to comply with consent conditions related to the quarrying activities and discharge of contaminants to land, specifically in respect achieving groundwater quality outcomes. The relevant performance indicators to ensure that the site activities are managed are:

- ∴ Ensuring that excavations do not expose groundwater in excavations.
- ∴ Ensuring that all backfill material is strictly managed to ensure it meets the definition of ‘clean fill’ under WasteMINZ guidelines.

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- ∴ Minimise any change to the physical and chemical properties of groundwater as result of the land use and discharge activities associated with quarry activities (as defined by the trigger levels in Table 2).
- ∴ Ensuring that under no circumstances that the land use and discharge activities associated with quarry activities result in groundwater quality exceeding the acceptable values in the Drinking Water Standards for New Zealand.

The following sections of this report detail the procedures and mitigation measures to achieve these outcomes.

3.0 Clean fill materials

The WasteMINZ document Technical Guidelines for Disposal to Land (2018) (WasteMINZ) define differing Classes of landfill and the technical constraints (i.e., hydrogeology, hydrology, ecology, etc.) on the Class of landfill considered acceptable for a particular location. The key hydrogeological technical constraint for the siting of different Classes of landfill is whether the underlying aquifer system beneath the proposed landfill is used for drinking-water purposes. Only Class 5 landfills are allowed to be sited over aquifers used for drinking-water purposes. Therefore, since the shallow groundwater aquifer system in the Peach Island area is used for drinking-water supply purposes, the proposed Peach Island Quarry is therefore defined as a Class 5 landfill.

WasteMINZ provides guidance on material that should be used to backfill a Class 5 landfill. To meet the requirements of the WasteMINZ guidelines and to provide protection of shallow groundwater resources in the area, only the following classes of material will be acceptable for placement at the Quarry site (Table 1).

Table 1: Summary of acceptable clean fill material	
Material	Discussion
Natural materials sourced onsite.	<ul style="list-style-type: none"> ∴ Uncontaminated soil, clay, rock and gravel. ∴ Quarry overburden comprising sand, clay and other soils (but specifically excluding peats, loams, topsoils and other soils with high organic content). ∴ Other inert natural materials arising from quarry operations provided that the volume of biodegradable matter (i.e., vegetative matter)

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Table 1: Summary of acceptable clean fill material	
Material	Discussion
	<p>in any material buried shall not exceed 2% by volume per load and is limited to incidental organic matter associated with the excavation of the inert natural materials.</p>
Natural materials sourced offsite	<p>Uncontaminated, natural materials arising from construction/excavation operations at uncontaminated sites and other quarry operations but specifically excluding any material sourced from any site listed on the Tasman District Council Hazardous Activities and Industries List (HAIL) register (as defined by the Ministry for the Environment) that is known to have been occurring before the date the clean fill material is received. This includes the following materials:</p> <ul style="list-style-type: none"> ∴ Rock, stone, gravels, soils, and other inorganic inert natural. ∴ Overburden/construction/excavation material comprising sand, clay and other soils (but specifically excluding peats, loams, topsoils and other soils with high organic content). ∴ Other inert natural materials provided that the volume of biodegradable matter (i.e., vegetative matter) in any material buried shall not exceed 2% by volume per load and is limited to incidental organic matter associated with the excavation of the inert natural materials. <p>Imported fill material will only be accepted if total soil contaminant concentrations are below regional soil background concentration limits.</p>

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All other materials of any description will be considered as unacceptable for placement unless written permission is obtained from the Regulatory and Compliance Manager at the Tasman District Council. Any permission shall not create a precedent, shall be made on a case-by-case basis and shall be restricted to the site of origin.



Furthermore, any material, that is understood to comply with the Table 1 definition, but displays visual or olfactory evidence of contamination, will either be set aside for chemical testing or rejected.

4.0 Proposed clean fill management system

Any excavation below the depth of the highest groundwater level shall occur when there is sufficient backfill material that is available to rapidly backfill the excavation up to the highest groundwater level prior to a rise in groundwater levels occurring. This is an important requirement to ensure that groundwater is not exposed in the quarry floor.

4.1 Receipt

All imported material received that is to be used for clean fill at the Quarry site shall be documented. This record keeping shall include:

- ✧ The date of receipt of the clean fill.
- ✧ The name of the CJ Industries staff member that delivered the clean fill to the site.
- ✧ The source of the clean fill.
- ✧ A description of the clean fill.
- ✧ The approximate quantity of the clean fill.
- ✧ Any documentation supplied to support the definitions of 'clean fill' (laboratory reports or similar).
- ✧ The name, signature, and staff designation of the person that accepted the fill on behalf of the quarry site.

CJ Industries will be the only organisation that delivers and places backfill into the Peach Island Quarry and that clean fill will meet the acceptance criteria specified in Section 3.0. This imported fill will be inspected and graded off site before delivered to the Peach Island Quarry solely by CJ Industries, except during civil emergencies when grading and inspection may occur on site.

Fill material provided by an external contractor will not be accepted by CJ Industries unless the acceptance criteria provided in Section 3.0 is met, the information listed above is provided and the contractor has signed a formal agreement confirming that the deposited clean fill will meet the acceptance criteria specified above. In these circumstances, the material will still be placed in the pit by CJ Industries.

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4.2 Inspection and testing of imported clean fill

The following procedures will be followed when material arrives at the quarry site:

- 1) Any imported clean fill requiring independent environmental investigation undertaken or supervised by a suitably qualified and experienced practitioner and laboratory test, as specified in Section 3.0, will require the documentation from that independent investigation be provided to the quarry operator and will only be allowed on site if the information confirms it is acceptable.
- 2) All imported clean fill that is visibly wet, has the appearance of mud, or that does not readily break apart due to the presence of moisture will be laid aside and not inspected until dry.
- 3) Any clean fill material displaying any visual or olfactory evidence of contamination (i.e. manmade hardfill, visible staining, odours, etc) will either be set aside for chemical testing or rejected.
- 4) Imported clean fill that has previously been subjected to chemical analysis prior to transport to the site and found to comply with the relevant criteria in Section 3.0 will be released for placement.
- 5) Random chemical testing will be carried out on imported clean fill from 1 truck in every 50 truckloads of fill as per the test requirements for material as specified in Section 3.0.

4.3 Placement of imported clean fill

- 6) A working excavation pit depth of no less than 1 m above groundwater level will be maintained.
- 7) Deeper excavations to no less than 0.3 m above groundwater level at the time of the excavation during dry conditions can be undertaken but must be backfilled with clean fill material on the same day as extraction.
- 8) All excavations to depths between 1 m and 0.3 m above groundwater level shall occur during dry weather conditions.

5.0 Groundwater level monitoring and excavation controls

In addition to ensuring all fill placed in the excavation pits is clean and uncontaminated, a key concern of the quarry operations at the Quarry site is exposure of groundwater within the excavation pit prior to being backfilled with clean fill material. To reduce the risk of groundwater contamination, excavation of gravel aggregate at the Quarry site will not occur within groundwater or result in the exposure of groundwater at the surface (i.e., groundwater exposed in the bottom of the gravel extraction pit). Therefore, groundwater level monitoring

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combined with surveying of pit excavations will be continuously monitored to avoid exposure of groundwater in any excavation(s). To achieve this, the following controls will be implemented:

Groundwater Level Monitoring

- 9) Groundwater levels shall be monitored in two dedicated upgradient monitoring bores located at the southern extent of the site and two dedicated downgradient monitoring bores located at the northern extent of the site.
- 10) All groundwater level measurements:
 - a. Shall be measured to a local common relative level to the nearest 3 mm accuracy (i.e., Nelson vertical datum 1955 or similar).
 - b. Shall be recorded via a temper-proof electronic recording device such as a data logger(s) that shall record groundwater levels taken every 15 minutes.
- 11) The groundwater level recording device:
 - c. Shall be connected to a telemetry system that collects and stores all of the data continuously with an independent network provider. No data shall be deliberately changed or deleted.
 - d. Shall be accessible to Tasman District Council at all times for inspection and/or data retrieval.
- 12) All groundwater level measurement data will be used to inform daily excavation depths (outlined in item 14)).

Excavation Controls

- 13) Commencement of quarrying shall occur at locations at the greatest upgradient distance from any water supply bores, as far as can practicably be achieved.
- 14) All onsite machinery used for excavation of pit(s) shall be equipped with onboard GPS and elevation systems capable of determining the elevation of the digging implement (i.e., excavator bucket).
- 15) The onboard GPS and elevation systems shall record elevation measurements to a local common relative level (as per item 10)a).
- 16) Excavations shall be maintained at a working depth of 1 m above the highest groundwater level measured in the onsite monitoring bores as described in items 10) and 11) on the same day as the active excavation of pit(s).



- 17) Deeper excavations to no less than 0.3 m above groundwater level at the time of the excavation can occur but must be backfilled with clean fill material on the same day as extraction.
- 18) During pit excavation, should the difference between the highest groundwater level at the quarry and the depth the excavation be less than 0.3 m, a warning system will notify the machinery operator and the Quarry operator.
- 19) Should groundwater levels be observed to increase while excavation is ongoing at the quarry and/or significant weather changes are forecast that could result in rapid increases in groundwater levels, suitable clean fill material should be placed as soon as practicably to back fill the excavated pit to ensure at least 1 m of material between the highest groundwater level and the base of the excavated pit is retained.
- 20) If any groundwater emerges into the excavation pit(s) all excavation activities will cease. All machinery will be moved away from the area of exposed water and no machinery will operate in exposed groundwater. Placement of natural strata (i.e., uncontaminated gravels, sands or silts) can occur to fill in the exposed water if required.
- 21) The Quarry operator will notify their consent compliance monitoring officer at Tasman District Council if groundwater enters the excavation pit area.
- 22) The following activities will not occur in any excavation pits at the quarry:
 - a. no storage of fuel or hazardous substances.
 - b. no refuelling activities.
 - c. no parking of unattended vehicles or machinery.
- 23) No excavations shall occur within 20 m of flowing, open waterways.

6.0 Response and mitigation to a spill

- 24) Staff operating in the excavation pit area(s) will be trained in the appropriate way to respond to a spill. A spill kit will be available in the excavation pit area(s).
- 25) In the event of a spill of machinery oil or fuel from excavation machinery, all works shall cease and measures will be taken to limit the extent of the spill and any contaminated strata or spill response material will be excavated and removed from the site to be disposed of at an appropriate disposal facility (subject to approval of the disposal facility).



- 26) If any spill greater than 20 litres occurs, the site operator will immediately notify the Tasman District Council Pollution Incident contact number.

7.0 Groundwater quality monitoring

The following monitoring of groundwater will be undertaken in relation to the excavation of pits:

- 27) Collection of groundwater samples from at least one dedicated monitoring bore located upgradient at the southern extent of the quarry areas (representative of background water quality) and at least two dedicated bores located downgradient of the quarry site near the northern extent of the quarry.
- 28) The monitoring bores shall allow groundwater samples to be collected across the full the range of groundwater level fluctuations.
- 29) The monitoring bores shall be made accessible to the Tasman District Council at all times for the purpose of groundwater sampling.
- 30) Groundwater samples from the dedicated monitoring bores listed in 27) will be collected at three monthly intervals. At least two samples will be collected prior to the commencement of quarrying activities and sampling will continue until two years after quarrying and backfilling activities cease.
- 31) All samples shall be taken by a suitably qualified and experienced person using methods described in the NEMS document "Water Quality – Part 1 of 4: Sampling, Measuring, Processing and Archiving of discrete Groundwater Quality Data" (2019). All samples for dissolved metal analysis must be filtered through a 0.45-micron filter onsite before being placed into an acid preserved sampling bottle.

All samples must analysed for the contaminants listed in Table 2 by an accredited laboratory.

The water quality monitoring results shall be provided to the Tasman District Council: Attention – Monitoring and Compliance within one month of them being received.

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Table 2: Water quality parameters and trigger concentrations		
Parameter	Trigger concentration	Note
Depth to water level	-	Measured prior to purging (where possible)
pH	<7.0 or >8.5	field and laboratory measurement
Electrical Conductivity	-	field and laboratory measurement
Water temperature	-	field measurement
Calcium	-	
Magnesium	-	
Hardness	200 g/m ³	Calcium + magnesium
Alkalinity	100 g/m ³	As CaCO ₃
<i>E. coli</i>	1 MPN/100ml	NZDWS MAV
Ammoniacal-N	1.2 g/m ³	
Nitrate-N	5.65 g/m ³ (annual average) 11.3 g/m ³ (maximum)	
Dissolved Aluminium	0.1 g/m ³	
Dissolved Arsenic	0.005 g/m ³	
Dissolved Cadmium	0.002 g/m ³	
Dissolved Chromium	0.025 g/m ³	
Dissolved Copper	1 g/m ³	
Dissolved Lead	0.005 g/m ³	
Dissolved Nickel	0.04 g/m ³	
Dissolved Manganese	0.04 g/m ³	
Dissolved Iron	0.3 g/m ³	
Sodium	200 g/m ³	
Sulphate	250 g/m ³	
Chloride	250 g/m ³	
BTEX compounds	Any detectable presence	



Table 2: Water quality parameters and trigger concentrations		
Parameter	Trigger concentration	Note
Total Petroleum Hydrocarbons	Any detection >0.1 g/m ³	
<i>NOTE: Trigger values are the guideline values for aesthetic determinands or 50% of maximum acceptable values in the Water Services (Drinking Water Standards for New Zealand) Regulations 2022 which take effect on 14 November 2022.</i>		

The trigger levels provided in Table 2 can be amended subject to written approval from Tasman District Council.

7.1 Response to issues arising from groundwater quality monitoring

- 32) An exceedance of the trigger levels will be deemed to have occurred if:
- a. The concentration of a contaminant in at least one of the downgradient bores exceeds the trigger levels in Table 2 and the concentration of the same contaminant in the upgradient bore is below the Table 2 trigger levels; or
 - b. The concentration of a contaminant in the upgradient bore exceeds the trigger levels in Table 2 and the concentration of the same contaminant in at least one of the downgradient bores is greater than concentration in the upgradient bore and is greater than 20% of the Table 2 trigger levels.
- 33) If there is an exceedance in a downgradient bore as determined by 32), the consent holder shall as soon as practicable and within 72 hours of receiving that result:
- a. Obtain a second sample of groundwater from the bore(s) in which the exceedance was identified in accordance with 27).
 - b. (b) Obtain a sample of groundwater from the upgradient bore specified in 27).
 - c. (c) Analyse these samples in accordance with 31).
- 34) If the results of analysis of the second groundwater samples carried out in accordance with 33) show that none of the concentrations of contaminants analysed exceed the trigger concentrations in Table 2 determined by 32), the consent holder shall continue to sample groundwater in accordance with 30).
- 35) If the results of analysis of the second groundwater samples carried out in accordance with Condition 33) show an exceedance of the trigger concentrations in Table 2 as determined by 32), the Consent Holder shall:

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- a. Notify the Tasman District Council – Monitoring and Compliance.
- b. Undertake an investigation into the potential cause(s) of the exceedance, which may include undertaking additional monitoring beyond the routine sampling.
- c. Implement necessary measures to reduce the concentration of the contaminant in groundwater. Such measures may include:
 - i. cessation of activities that may have caused the exceedance.
 - ii. removal of the contaminant source(s).
 - iii. stabilisation or capping of the contaminant source(s).
 - iv. revision of groundwater and clean fill management procedures and updating it accordingly.

36) Any material removed in accordance with 35)c(ii) shall be disposed of at a facility authorised to receive such material, and the Consent Holder shall provide the Council, Attention: Regional Leader – Monitoring and Compliance, with written confirmation of such disposal within 10 working days.

7.2 Downgradient water supply bores

- 37) Groundwater samples shall also be collected from up to three downgradient water supply bores within 500 m of the quarry, subject to approval of the bore owner and the land owner.
- 38) Prior to the use of any of the water supply bores for groundwater monitoring, a bore condition survey should be carried out to identify any existing potential sources of contamination related to the condition of the bore head or its proximity to localised sources of contamination.
- 39) The Consent Holder shall monitor the drinking water quality of the water supply bores in 37) at the same time as the dedicated monitoring bores in 27). If the monitoring shows that the drinking water quality in the water supply bores in 37) does not comply with the New Zealand Drinking Water Standards (NZDWS) and the non-compliance is proven to be associated with quarrying activities, then the consent holder shall, with agreement of the bore owner and the land owner, provide an alternative drinking water supply to a similar standard as existed prior to commencement of this consent.

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7.3 Water quality complaints

- 40) The quarry operator shall also maintain a complaints register and investigate any complaint of bad taste, odour or illness reported in downgradient bores used for water supply purposes within 500 m of the quarry. These complaints shall be investigated and recorded, including:
- a. The location where the complaint was experienced.
 - b. The date and time when the complaint was experienced.
 - c. A description of the excavating and filling activities that were being undertaken prior to the complaint being experienced.
 - d. The most likely cause of the complaint.
 - e. Any corrective actions undertaken by the consent holder to avoid, remedy, or mitigate any contribution the quarrying activities are likely to have made to the situation that caused the complaint.

A complaint to a quarry shall be investigated jointly depending on the quarry area affected. This record shall be provided to the Manager, RMA Compliance and Enforcement, Tasman District Council following any investigation into a complaint.

8.0 Reporting

- 41) An annual monitoring report will be prepared for the period of 1 July to 30 June to the Tasman District Council: Attention – Monitoring and Compliance, by 30 September each year. The annual monitoring report shall include but not be limited to:
- a. Results of groundwater quality monitoring as required by 27) to 39) and include:
 - i. A discussion of any groundwater quality trends.
 - ii. Any exceedances of the Table 2 contaminant trigger concentrations.
 - iii. Any mitigation actions taken in response to the exceedances.
 - iv. A description of how effective any mitigation actions were in addressing the exceedances.

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- v. A description of the drinking water quality results from bores used for domestic supply/irrigation purposes located downgradient of the quarry.
- b. Groundwater level data including:
 - i. A copy of the telemetered groundwater level data measured at the site.
 - ii. A copy of the excavation elevation data.

9.0 References

Ministry of Health (MoH). 2018. Drinking-water Standards for New Zealand 2005 (Revised 2018). Wellington: Ministry of Health.

National Environmental Monitoring Standards (NEMS). 2019. Water Quality – Part 1 of 4: Sampling, Measuring, Processing and Archiving of Discrete Groundwater Data. Version 1.0.0. March 2019

Taumata Arowai. 2022. Water Services (Drinking Water Standards for New Zealand) Regulations 2022. June 2022. Taking effect on 14 November 2022.

Waste Management Institute New Zealand (WasteMINZ). 2018. Technical Guidelines for Disposal to Land. April 2018.

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