SECTION 42A STAFF REPORT FOR RESOURCE CONSENT APPLICATION RC-2023-0046 BY TIGA MINERALS AND METALS LTD TO UNDERTAKE MINERAL SAND MINING AND ASSOCIATED ACTIVITIES AT BARRYTOWN, WITHIN EXPLORATION PERMIT EP51804

Introduction

Hearing of application

[1] This report is the planning report under section 42A (s42A) of the Resource Management Act 1991 (RMA) for the application made to West Coast Regional Council (WCRC) by TiGa Minerals and Metals Ltd ('Tiga', or 'the applicant').

[2] The application was publicly notified.

[3] Hearing of the application is scheduled to commence on 5 February 2024.

Recommendation to hearings panel

[4] In my opinion, at present there is not a sufficient case for granting the resource consents. The key element of the application is the need for it to establish a "functional need" for the activity in this location. Specifically, the relevant location is the Canoe Creek Lagoon (a natural inland wetland) and the margin of 100 m around it, to which the National Environmental Standards for Freshwater (NES-F) apply. Extraction and related work are proposed within that margin. For resource consents to be granted under the NES-F, the applicant needs to establish a functional need to undertake their proposed works there. A functional need will be present only if an activity "can only occur" there. The bulk of application site is outside of this area, although the water management system for the site makes use of the wetland and surrounding water bodies. Unless a functional need can be shown to exist the application cannot be granted.

[5] If a functional need for the activity in this location can be shown, a pathway to granting the resource consents is possible.

About this report

Purpose and status

[6] Section 42A of the RMA provides for a consent authority to commission a consultant to prepare a report on information provided by resource consent applicant and submitters.

[7] The purpose of this s42A report is to assist the Commissioners with:

a. Considering any directions or requests that might be made before at the hearing (s41C)

b. Considering and determining the application (ss104 to 107)

c. If the requested consents are to be granted, setting any conditions on the consents (s108).

[8] The contents and recommendations of this report are not to be construed as WCRC policy.

[9] The recommendations of this report are not binding on the Commissioners hearing the application and making decisions on the application under delegated authority.

[10] The hearings panel determined that this report could be provided to the parties in accordance with the timetable in section 103B with a one day time extension.

[11] Once circulated to the parties, this report is to be treated as evidence before the hearing. Whilst it is a report of a planning expert acting as an expert witness, the report has no higher status than any other evidence provided to the hearing.

Principles adopted in report

[12] Section 42A of the RMA states that reports prepared under this section do not need to repeat information included in the applicant's application and instead may adopt all or parts of the information presented in the application. In this report I have adopted parts of the application, including as modified by responses to s92 requests for further information and supplementary information provided during further processing of the application. In the parts of this report where I have not adopted information provided by the applicant, or where I disagree with the application's assessment, this is made clear within the relevant sections of this report.

[13] Section 18A of the RMA requires councils and consent applicants to: *"take all practicable steps to use timely, efficient, consistent, and cost-effective processes that are proportionate to the functions or powers being performed or exercised."*

[14] In accordance with s18A, I have prepared and structured this report to highlight and provide relevant analysis and commentary on the application in a manner that is proportionate to the issues, risks and effects raised by the applicant's proposal.

Information relied on in the preparation of this report

[15] In preparation of this report, I have had regard to the following documents:

a. Application for Resource Consent to Grey District Council and West Coast Regional Council, Mineral Sand Mining Activities at Barrytown (Prepared by Tai Poutini Professional Services Ltd, dated 18 April 2023 ('the application')

b. Attachments A to V of the application

c. Further information requests from Grey District Council (GDC) and WCRC, and responses to these requests supplied by the applicant

d. Submissions received, and the summary of submissions prepared by Mark Geddes

[16] All these documents, except the summary of submissions, are available on the GDC's web page dedicated to the application.

<u>About the author</u>

[17] My full name is Dr Michael Durand.

[18] I am Consultant Planner at Planz Consultants Ltd where I have worked since November 2023. I hold an honours degree in Physical Geography from University of Plymouth (UK) and a PhD in Earth Sciences from the University of Wales, Aberystwyth (UK). In New Zealand I held post-doctoral research positions for four years at the University of Canterbury researching environmental and human health effects of air pollutants including hydrogen sulphide (H_2S) and particulate matter. I have presented evidence as an expert witness at a Coroner inquest into H_2S poisoning.

[19] I also have seventeen years professional experience working in resource management in New Zealand, primarily in developments subject to the consenting requirements under the management of regional councils, the development of regional policy for the use of water and land, and nationally in environmental policy and regulatory design. This experience includes:

a. Between 2006 and 2012 I was a Consents Planner, Senior Consents Planner and Team Leader at Tasman District Council and Nelson City Council (both unitary Councils), processing and managing teams processing applications for regional land use consents, water permits, discharge permits and coastal permits.

b. Between 2012 and 2015 I was Senior Analyst at the Ministry for the Environment where I lead policy development and implementation of the Resource Management Amendment Act 2013 and worked on RMA policy development.

c. Between 2015 and 2020 I was the Consents Manager at Southland Regional Council leading the Council's consent processing and making approximately 900 delegated decisions on resource consent applications annually.

d. Between 2020 and November 2023 I was an Environmental Planner at Pattle Delamore Partners Ltd.

[20] I have appeared as a planning witness before consent hearings and in Environment Court mediation (where I had delegated authority to sign off on the mediated outcomes).

[21] I am also a certified Hearings Commissioner under the Ministry for the Environment's Making Good Decisions programme and I am on decision-making panels at Environment Canterbury, Marlborough District Council, Nelson City Council and Tasman District Council.

[22] I have written about the RMA's practice and implementation in the form of technical guides and discussion pieces for planners, particularly on cognitive bias in planning, the implementation of the National Policy Statement for Freshwater Management 2020 (NPSFM), and the National Environmental Standards and National Policy Statement for Greenhouse Gas Emissions from Process Heat.

[23] Of particular relevance to this application are my past roles in regional and unitary councils where I was responsible for assessment (as a processing officer) or decision making on activities such as landfills, fumigation, combustion air discharges, river management and proposals affecting wetlands. As a consultant, I have overseen and prepared tens of applications for activities where the National Environmental Standards for Freshwater (NES-F) and NPSFM are relevant.

[24] I have read and agree to abide by the Environment Court's code of conduct for expert witnesses.

[25] I have been involved in this application, as the processing planner for WCRC, since early November 2023.

Preliminary matters

Applicant, site and summary of proposed activities

[26] The applicant is TiGa Minerals and Metals Ltd ('Tiga', or 'the applicant'). Tiga is a registered New Zealand limited company and is a person as defined in section 2 of the RMA. From 2015 to 2022 TiGa was named Barrytown JV Ltd, which lodged, but was refused, applications for similar activities at the same site.

[27] The site is located on the Barrytown Flats near the western base of the Paparoa Range, approximately 30km directly north of Greymouth, 4km north of Barrytown and 10km south of Punakaiki Township. The approximate location of the site is shown in Figure 1 of the application.

[28] TiGa has made applications for resource consent to the WCRC and the GDC seeking to authorise a range of activities associated with mineral sand mining at the site. This report is limited to activities that fall within the jurisdiction of WCRC.

[29] The sand mining process involves a range of site preparation and operational works including stripping of top soil and overburden, extraction of ore (unprocessed sand), stockpiling, processing of ore, return of remnant processed material to the mine void, and rehabilitation. These works also include a range of operational activities including water management, dust management and a range of monitoring activities. The works are to be arranged onto 10 'Panels' (akin to stages), with each having their own phase of preparation, extraction, rehabilitation and management.

[30] The site has been well described in the s42A report of Mr Geddes for GDC (refer to paragraphs 15-30 of that report). I will not repeat that description, other than to highlight elements of the site activities relevant to WCRC's jurisdiction and the resource consent being sought by TiGa from the WCRC:

a. Several waterbodies are located adjacent to, or within, the site: Collins Creek, Canoe Creek, Canoe Creek Lagoon and wetland complex, Rusty Lagoon, Deverys Creek, and Deverys Lagoon and wetland complex.

b. According to the application:

   i. Canoe Creek has been assessed as having a high-quality aquatic environment

   ii. Springs on the southern part of the property are used by the neighbouring property for domestic and stock water

   iii. A small and modified ephemeral stream exists in the northern part of the site before entering Rusty Lagoon

   iv. The site has a central drain running diagonally from south-east to north-west. Several further drains exist across the site that form part of the humped and hollowed drainage network that drains the existing paddocks into existing waterways.

c. The proposed mining activity is approximately 250m from the coastal marine area (CMA) (at its closest extent) and this area is elevated approximately 4-6m above mean sea level. The site and its activities are therefore outside of the CMA (s2 of the RMA), but is within or at least adjacent to the coastal environment area under the New Zealand Coastal Policy Statement (NZCPS) (as described by Policy 1 of the NZCPS). Canoe Creek Lagoon, which is affected by the application, is certainly within the coastal environment.

[31] Where relevant, I have given more detailed consideration to the existing environment later in this report.

Applications made and resource consents required

[32] The application states the resource consents TiGa considered are required, and are sought from WCRC. The GDC s42A report replicated that assessment.

[33] I do not wholly agree with the application's assessment of the resource consents required. Below (paragraph [35] onwards) is my assessment of the resource consents required from WCRC.

[34] Under my assessment, TiGa has not explicitly applied for all the resource consents I believe are required. However, this is not necessarily problematic as:

a. TiGa has stated on Section 4.1 of the application that *"TiGa seeks all consents necessary to authorise the mining activity, associated processing and transportation of the resulting Heavy Minerals Concentrate",* and

b. The application, including attachments, addresses all of the relevant effects, whether or not consent has been explicitly applied for (except for discharges of combustion emissions).

Resource consents required

[35] The resource consents required from WCRC are:

[36] Land use consent:

a. under Regulation 45D(3) of the NES-F (discretionary activity):

i. to use land for earthworks and land disturbance within a 100m setback from a natural inland wetland.

b. under Rule 16 of the Regional Land and Water Plan (LWP) (discretionary activity):

i. to use land for earthworks and vegetation clearance within 10m of a riparian margin.

ii. to use land for earthworks within 50m of the Coastal Marine Area.

iii. to use land for earthworks exceeding 5000m^3 per annum.

[37] Water permit:

a. under Regulation 45D(4) of the NES-F (discretionary activity):

i. to take and use water within a 100m setback from, a natural inland wetland.

b. under Rule 56 of the LWP (restricted discretionary activity):

i. to take and use groundwater for the purposes of mineral sand mining and processing, pit dewatering and well-point pumping.

c. under Rule 55 of the LWP (restricted discretionary activity):

i. to take and use of surface water from Canoe Creek for the purposes of mineral sand mining.

[38] Discharge permit (to land):

a. under Rule 71 of the LWP (discretionary activity):

i. to discharge water including contaminants (dewatering water, treated mine, process and stormwater) to land where it may enter water.

[39] Discharge permit (to water):

a. Under Regulation 45D(5) of the NES-F:

i. to discharge water into water within a 100m setback from a natural inland wetland.

b. under Rule 91 of the LWP (discretionary activity):

i. to discharge water including contaminants (dewatering water, treated mine, process and stormwater) to water in Collins Creek, the Northern Boundary Drain and Canoe Creek.

[40] Discharge permit (to air):

a. under Rule 16 of the Regional Air Quality Plan (AQP) (discretionary activity):

i. to discharge unanticipated dust emissions from stockpiling and mining activities

ii. to discharge combustion emissions, including of greenhouse gases, from operational machinery

[41] Discharge permit (to land, water and air):

a. Under the LWP and the AQP:

i. to discharge ionizing radiation into water (Rule 71 of the LWP)

ii. to discharge ionizing radiation from an industrial or trade premises into air (Rule 16 of the AQP)

iii. to discharge ionizing radiation into land (Rule 91 of the LWP).

Reasons for differences – discharges of ionizing radiation

[42] A discharge permit is likely needed for the discharge of ionizing radiation to land, water and air for the following reasons:

a. Section 15 of the RMA controls discharges of "contaminants" into the environment.

b. A contaminant is any substance, energy or heat which when discharged into the environment causes or is likely to cause a physical, chemical or biological change to water, land or air (s2). Radiation is a form of energy.

c. Consequently, if an emission of radiation causes a physical, chemical or biological change to water, land or air, then it is a contaminant. If the emission causes no change, then it is not a contaminant.

[43] If radiation is a contaminant then s15(1) of the RMA applies, and thereby any relevant rules in regional plans apply. The relevant "catch all" rules are as stated above.

[44] I note that Rule 11 of the AQP permits discharges of "X-rays from a radioactive source" (a high energy form of electromagnetic radiation). The explanatory note for Rule 11 states that:

a. *"This rule also provides for the release of X-rays. X-rays are released in a range of industrial processes used for testing the integrity of pipes, welding and structures. The control of radiation is administered by the National Radiation Laboratory. Permitting these activities avoids the duplication of current legislative requirements and controls relating to radiation."*

[45] My (non-expert) understanding is that the likely radioactive emissions from mineral sand are not X-rays and are not permitted by Rule 11 of the AQP.

[46] Therefore, Rule 16 of the AQP is the relevant rule.

Regulation 45A vs 45D of the NES-F

[47] The application suggested Regulation 45D of the NES-F applies, which is relevant to "Extraction of minerals and ancillary activities".

[48] Regulation 45A may instead be the appropriate regulation as this applies to "Quarrying activities". Regulation 3 of the NES-F defines quarrying activities, as per the National Planning Standards, as follows:

a. *"Quarrying activities: means the extraction, processing (including crushing, screening, washing, and blending), transport, storage, sale and recycling of aggregates (clay, silt, rock, sand), the deposition of overburden material, rehabilitation, landscaping and cleanfilling of the quarry, and the use of land and accessory buildings for offices, workshops and car parking areas associated with the operation of the quarry."*

[49] This definition captures TiGa's proposal, but I note the proposal to return the sand to the mine void of the extracted sand following processing. The National Planning Standards do not define "extraction of minerals."

[50] A comparison of Regulation 45A and 45D shows the only differences are the alternate use of the terms "quarrying" (Regulation 45A) and "the extraction of minerals and ancillary" (Regulation 45D), except for the additional sub-parts to Regulation 45D(7) and (8) which refer only to the extraction of coal.

[51] Therefore, I suggest the correct interpretation of the NES-F is as the applicant proposed, and the various applications are under r 45D, noting this does not have a material effect on the application or its processing.

Reasons for differences – discharges of combustion emissions including greenhouse gases

[52] Emissions, other than of ionizing radiation (above) and of dust (which has been applied for separately and is from a different source), are captured by Rule 16 of the AQP.

[53] Emissions to air captured by Rule 16 now include discharges of greenhouse gases (following the repeal of s104E in November 2022). Consequently, discharges of greenhouse gases to air from industrial and trade premises are discretionary activities under this rule.

Reasons for differences – separation of resource consents for discharges to land, water and air

[54] The application suggested various consents should be combined across types (e.g. combined land use and discharge permits) and across receiving environments (e.g. a single permit to discharge to land and water).

[55] For reasons of convention and simplicity, I have suggested instead that there be separate resource consents according to their type and receiving environment. That is, except for the case of radiation emissions, which as a discrete activity and effect made sense to combine into one discharge permit covering all receiving environments.

[56] In my assessment above, this has resulted in more individual resource consents being necessary than were proposed by the applicant.

Summary

[57] Overall, and in summary, I suggest a decision to grant resource consent would be best implemented with seven resource consents as follows:

a. Land use consent to use land for earthworks exceeding 5000m^3 per annum, land disturbance and vegetation clearance within a 100m setback from a natural inland wetland, 10m of a riparian margin, and 50m of the Coastal Marine Area

b. Water permit to take and use groundwater for the purposes of mineral sand mining and processing, pit dewatering and well-point pumping

c. Water permit to take and use surface water for the purposes of mineral sand mining and processing, pit dewatering and well-point pumping

d. Discharge permit to discharge dewatering water, treated mine water, process water, stormwater and contaminants to land where it may enter water

e. Discharge permit to discharge dewatering water, treated mine water, process water and stormwater water and contaminants to water in Collins Creek, the Northern Boundary Drain and Canoe Creek, including within 100m of a wetland

f. Discharge permit (to air) to discharge dust and combustion emissions to air

g. Discharge permit to discharge ionizing radiation to land, water and air

Status of primary legislation

[58] The primary legislation applicable to this application is the RMA.

[59] Amendments to the RMA have been made since the lodgment of the application. The relevant version of the RMA for considering this application is the version as at 24 August 2023, with the exception of its content on the matters below.

Relevance of recent amendments to the RMA

[60] Whilst the RMA is the primary legislation, the recent enactment and then repeal of the Natural and Built Environment Act 2023 (NBEA), which changed the RMA, are worth brief explanation.

[61] In short, a notable amendment to the RMA made by the NBEA was the insertion of Part 6 into Schedule 12 of the RMA, which limited the duration of water permits and discharge permits (i.e., 'affected resource consents') to a period that did not exceed 5 years after the date that rules of the relevant Natural Built Environment Plan came into effect in accordance with clause 6(4) of the Schedule 1 of the NBEA. Part 6 of Schedule 12 of the RMA was repealed on 23 December 2023, the day after Royal assent of the Resource Management (Natural and Built Environment and Spatial Planning Repeal and Interim Fast-track Consenting) Act 2023. The effect is that, for a short time, new provisions in the RMA may have been relevant to this application but this is no longer the case.

[62] My understanding of the work of the Parliamentary Counsel Office is that there may sometimes be a delay between the relevant changes being made to the legislation available online (as confirmed by the dated version of the RMA online at the time of writing, being the 24 August 2023 version. By the time of the hearing, the RMA's latest online version may not reflect the changes made to Schedule 12 of RMA as outlined above.

Relevance and status of regional plans, policy statements, national policy statements and regulations

[63] The relevant planning instruments, and their status are as follows.

National instruments

[64] National Policy Statement for Freshwater Management (NPSFM) – in force – amended Feb 2023 – provides policy direction for decisions affecting freshwater including rivers and natural inland wetlands

[65] Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F) – in force – amended 21 September 2023 – provides for resource consent pathways for certain activities affecting freshwater including natural inland wetlands

[66] Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 – in force – amended 3 September 2020 – provides a measurement and reporting regime for water takes

[67] New Zealand Coastal Policy Statement 2010 (NZCPS) – in force since 4 November 2010 – includes policy direction for proposals affecting the coastal environment.

[68] National Policy Statement for Indigenous Biodiversity 2023 (NPSIB) – in force since 7 July 2023 – includes policy direction affecting indigenous biodiversity, including indigenous biodiversity in freshwater and wetlands.

Regional instruments

[69] West Coast Regional Policy Statement (RPS) – Operative – Made operative 24 July 2020

[70] Regional Air Quality Plan (AQP) – Operative – Made operative 31 July 2002

[71] Regional Land and Water Plan (LWP) – Operative – Made operative 27 May 2014; Plan change 1 made operative 22 October 2020. Changes to the LWP have also been made to implement clauses 3.22, 3.24 and 3.26 of the NPSFM, although these changes have not incorporated into the online version of the LWP

[72] Regional Coastal Plan (RCP) – Operative – Made operative 6 June 2006.

[73] Proposed Regional Coastal Plan – proposed – The plan making process appears to have reached the stage of further submissions but is currently suspended

Notable instruments that are not relevant

[74] For completeness, I make the following observations on other planning instruments.

[75] There are no relevant Water Conservation Orders.

[76] The Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 are not relevant as there are no sources of drinking water that are potentially affected by the application.

[77] Whilst emissions of greenhouse gases are a relevant consideration for this application, the NES for Greenhouse Gas Emissions from Process Heat does not apply, nor does the accompanying national policy statement.

[78] The Resource Management (National Environmental Standards for Air Quality) Regulations 2004 are not applicable here as they only apply to certain activities (not relevant to this proposal), and to discharges of particulates in polluted airsheds (the airshed is not polluted).

[79] The Resource Management (Marine Pollution) Regulations 1998 are only relevant for activities within the CMA, so are not relevant here.

Consideration of the applications is subject to Part 2 of the RMA

[80] Consideration of these applications is under section 104 of the RMA.

[81] Section 104 states consent authorities must have regard to relevant provisions of the documents listed above. The documents are intended to be prepared in a manner where:

a. Regional plans give effect to national policy statements and any regional policy statement (s67)

b. Regional policy statements give effect national policy statements (s62)

c. National policy statements (s45A) state objectives and policies for matters of national significance that are relevant to achieving the purpose in Part 2.

d. Additionally, National Environmental Standards have a relationship with plans and resource consents as set out in s43B.

[82] If operating correctly, the cascade of documents provides for decisions to be made on consent applications that are consistent with Part 2 by reference to regional plans only, since the principles of sustainable management have flowed down the cascade by each document giving effect to the next.

[83] This has been recognized by the Courts since the King Salmon decision with the most recent authority on this matter being *R J Davidson Family Trust v Marlborough District Council [2018] NZCA 316*. The judgment in this case has clarified that:

a. where it is clear that a plan is *"prepared having regard to pt 2 and with a coherent set of policies designed to achieve clear environmental outcomes"* the Court envisaged that *"the result of a genuine process that has regard to those policies in accordance with s 104(1) should be to implement those policies."*

b. in those circumstances, reference to Part 2 would not add anything, and *"could not justify an outcome contrary to the thrust of the policies."*

c. however, where that the plan has not been prepared in a manner that appropriately reflects the provisions of Part 2, then the consent authority *"will be required to give emphasis to pt 2".*

[84] Only where necessary will I have regard to documents, higher in the cascade than the regional plans, under s104. In particular, this is by considering where relevant:

a. Whether the regional plans give effect to the regional policy statement

b. Whether the regional plan gives effect to a relevant national policy statement

c. If needed, whether the regional policy statement gives effect to relevant national policy statement

Required and optional statutory considerations

[85] For completeness, below I briefly set out here the relevant statutory provisions that must and could be applied to the application.

[86] Section 104(2) states that consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.

[87] I note the application's assessment of the permitted baseline (Section 5.5) assessed *"rules in the relevant operative plans which permit activities with a similar level of effect."* The correct test is whether *"that effect"* is permitted, not whether the effect is similar.

[88] The application is for a discretionary activity so s104B applies. The consent authority may grant, or refuse consent, and may impose conditions under s108. Conditions are required to meet the requirements of s108AA.

[89] Section 105 applies, as the application is for discharge permits. Regard must be had to: the nature of the discharge; the sensitivity of the receiving environment to adverse effects; the applicant's reasons for the proposed choice to discharge to that environment; and, any possible alternative methods of discharge, including discharge into any other receiving environment.

[90] Limitations in s107(1)(c)-(g) and exclusions in s107(2) apply to the proposed discharges.

[91] A bond may be imposed under s108A. I recommend a bond is imposed if consents are granted.

[92] Duration is limited in accordance with s123. If consent is granted, I recommend a duration of no longer than 12 years, as requested by the applicant.

[93] Any consent granted will lapse after 5 years, under s125 of the RMA, unless a lapse date is specified in the consent.

[94] A consent may specify the times when conditions may be reviewed by the consent authority (under s128) and the reasons that review purpose of a review. I recommend, if consents are granted, that a suitable review condition is included.

Applicant's proposal

[95] The overall proposal and the site have been described in the application and the GDC s42A report. Here I will set out the proposal in terms of the component activities that require resource consent from WCRC.

Use of land for earthworks, land disturbance and vegetation clearance

[96] Overall, the applicant's proposal is to mine and process mineral sands at the site over an area of approximately 63ha. The unprocessed sands (ore) contain heavy metallic minerals.

[97] To access the ore, stripping and stockpiling of topsoil and overburden will occur. The application states that overburden and topsoil varies in depth between 0.5m depth (in the western margins) and 8m depth (eastern margins). This part of the work comprises land disturbance, earthworks (including stockpiling and the construction of bunds) and vegetation

clearance. Parts of the work are within a 100m setback from a natural inland wetland, 10m of a riparian margin, and 50m of the Coastal Marine Area. The works are proposed to be undertaken in a sequence of ten 'Panels'. Each Panel comprises a mine pit area limited to 3ha at any one time, including 0.5ha of stripped overburden and topsoil.

[98] Land use consent is required for this work under the NES-F and the LWP.

[99] Material to this activity is also the likely discharge to air of dust from disturbed land, constructed internal road access, bunds and stockpiles. An air discharge permit has been applied for as a precaution (considered further below).

Water use, management and discharge

[100] Groundwater and surface water management are material to the site and the operation in a number of ways. Primary importance to the proposal is to ensure that the operational pit can be mined, which requires it to be dewatered by lowering the groundwater level within the operational pit. Of related primary importance is the need to ensure any effects on neighbouring surface waterbodies are acceptable. These waterbodies are potentially affected as they are hydraulically connected to operation via the groundwater or affected via discharges from the water management system.

[101] The application describes the proposed water management regime (Section 3.46 to 3.55). In summary, my understanding of the process is that:

a. Dewatering of the mine void will occur to provide a dry working area

b. Dewatering is to occur by well-pointing

c. Water extracted by dewatering is

    i. to be used in the ore Processing Plant (the Plant), and

    ii. excess water that exceeds the Plant's requirements is to be pumped for storage and treatment (by settlement and possibly flocculants) to the Mine Water Facility (Ponds 1 and 2)

d. Irrespective of whether there is excess water from dewatering, processing water will eventually be discharged to the Pond 1 for storage and treatment

e. Overflow from Pond 2 of the Mine Water Facility will flow, via a constructed Central Drain, to the Clean Water Facility (Ponds 3 and 4)

f. Clean water from Pond 4 will either:

    i. Discharge by gravity to the Canoe Creek Lagoon, or

    ii. Be discharged to infiltration trenches around the perimeter of the mining area, to reduce the hydraulic gradient affecting surface water.

g. The application indicates that a take, from Canoe Creek, of 67L/s may be needed to prime the water management system, and may occasionally be needed to supplement ore processing.

[102] Hydraulic connectivity between groundwater and surface water means that a stream depletion effect is expected to occur from the pumping of groundwater from the pit area. This effect is planned to be countered by discharge of clean water from Pond 4 into infiltration trenches close to these waterbodies. In this manner the groundwater in the immediate vicinity of the water bodies will be recharged.

[103] The mining sequence (refer Figure 1 of the application) is designed, as I understand it, partly to enable water management techniques and infrastructure to be refined while maintaining adequate setbacks from surface water bodies. The initial Panels (1-5) maintain a separation between the groundwater pumping and nearby water bodies. Later Panels (6-10), as proposed by the applicant, will be undertaken after some operational experience of water management at the site has been accrued.

[104] Whilst not explicitly stated in the application, this provides:

a. operations in Panels 5-10 (which are closer to waterbodies than Panels 1-5), <u>if</u> water management is known to be adequate to protect these waterbodies, and

b. scope for adaptation of methods and/or setbacks from waterbodies if necessary.

[105] As an aside, and on a closely related issue, I do note that the application outlines the applicant's concerns for land instability on other properties created by the operation (paragraph 5.33 of the application onwards). Consent conditions have been proposed by the applicant to manage that issue. The conditions are the subject to expert caucusing. Any such issues are likely to affect waterbodies surrounding the site as well, given their location relative to the proposed mining.

[106] I also note that the application states that there are expected to be hydrological effects on wetlands. Paragraph 4.12 of the application states that consent has been sought under Regulation 45D of the NES-F as:

> *"This will allow for a temporary partial reduction in water levels, which is intended to be immediately rectified through mine water management practices outlined in the hydrological assessment."*

[107] In relation to the management of water volumes to enable the mining operation, five particular matters arise, and are considered further below (paragraphs [141] onwards) as they are relevant to the question of whether effects (including potential effects) will be avoided, remedied or mitigated:

a. whether the system is adequate to manage groundwater water volumes that may encountered (to enable mining to occur)

b. whether there is adequate space for water management infrastructure adjacent to the pit walls (particularly in Panels 5-10, which are adjacent to waterbodies)

c. to what extent there is a risk of pit wall collapse occurring as a result of infrastructure placement and water reinjection

d. how resource consent conditions or a management plan (or both) can ensure adequate standards for water management are met – in particular, in relation to managing the effect of the operation on water levels in surrounding waterbodies

e. how resource consent conditions or a management plan (or both) can adequately manage risks arising from pit wall collapses

[108] In relation to the management of water quality, I refer to the proposed treatment system. As I understand it the system will combine and treat extracted groundwater (from dewatering) and used process water (sourced from groundwater and/or surface water) through a sequence of treatment ponds prior to either (or both) reinjecting the water to the infiltration trenches to manage surface water depletion, or discharging it to the Canoe Creek lagoon.

[109] Five particular matters arise in relation to water quality:

a. whether the system is adequate to treat the volume of water passing through it to appropriate standards for reinjection

b. whether the system is adequate to treat the volume of water passing through it to appropriate standards for discharges into surface water

c. whether the system is able to compensate for stream and wetland depletion during times of low groundwater (for example, under drought conditions)

d. to what extent, and under what circumstances, there is a risk that the system is unable to treat the water to an adequate standard

e. how any resource consent conditions or management plan (or both) can ensure adequate standards for water quality are met

f. how any resource consent conditions or management plan (or both) provides for a situation where water quality standards are not met.

[110] As listed above, water permits are required to take and use surface water and groundwater. Discharge permits are required to discharge treated mine water to land (for the purpose of recharging groundwater) and to water (the overflow into the Canoe Creek Lagoon). The land use consent for earthworks and land disturbance is noted here as being an integral part of the water management proposal.

Mining sequence

[111] The proposal to undertake mining in a sequence of preparatory work, extraction from the series of ten Panels, and rehabilitation, has been described in the application and summarized in the GDC s42A report (paragraphs 40-43). Its key components are also listed above in relation to the resource consents required from WCRC.

Stockpiles and dust management

[112] Various temporary and permanent stockpiles are proposed, principally to manage topsoil and overburden prior to its placement, to from a new ground surface, following re-filling of the mine void.

[113] Stormwater and dust emissions from these stockpiles are intended to be managed using a sediment and erosion control plan and a dust management plan. I understand that water intended to be used for dust management purposes is to be sourced from Pond 4.

Section 104(1) considerations

[114] Section 104 of the RMA outlines the matters for consideration of resource consent applications. Section 104(1) deals with the consideration of an application and the submissions received on that application, having regard to the effects of allowing the activity, measures to offset or compensate for adverse effects, relevant provisions of policy documents, and any other matters reasonably relevant to have regard to.

[115] This requires assessments of:

a. The environment as it stands now

b. The altered state of the environment, as it stands to be affected if the proposed activity is allowed

c. The content of submissions, especially as they relate to those effects or effects on people

d. The provisions of plans and policy statements relevant to those effects and the proposal

e. When deciphered through plans and policy statements:

i. The significance and acceptability of these environmental effects

ii. The extent to which the proposal and its effects align with the policy positions of those plans and policy statements

iii. The extent to which the proposal, if implemented, will assist or detract from achieving the objectives stated in those plans and policy statements.

[116] I have given weighting to those plans and policy statements, and ultimately considered whether to evaluate those effects against Part 2, in accordance with the approach described above in paragraphs [80] onwards.

[117] The types of effects arising from the proposal, and within the scope of my assessment, are:

a. Positive effects

b. Cultural effects

c. Effects on groundwater, surface water and aquatic ecosystems:

i. Hydrological effects on adjacent waterbodies arising from normal operations (including groundwater management, process water management and stormwater management)

ii. Water quality effects in adjacent waterbodies arising from normal operations

iii. Effects on aquatic ecology arising from normal operations

iv. Hydrological and aquatic ecosystem effects arising from water management problems

d. Effects of dust emissions on air quality and effects arising from the deposition of dust

e. Effects from the emission of radiation

f. Effects on climate change from the emission of fossil fuel combustion discharges.

Positive effects

[118] The application has presented a case for positive economic effects for the region, both through direct employment (57 jobs) and secondary employment through supporting businesses (80 jobs). That assessment has been peer reviewed by Tim Health of Property Economics, who concluded: "we believe it [the application] has provided sufficient evidence that the application would constitute a regionally significant activity."

Cultural effects

[119] The application (paragraphs 5.65 onwards) states the cultural effects expected to occur, noting that there are taonga species present in the area, that pounamu is expected to be found (and

returned to the mine void), and that discussions have been ongoing with Te Rūnanga o Ngāti Waewae.

[120] It note that neither runanga nor iwi made a submission on the application.

[121] However, Te Whatu Ora submitted that the provides insufficient documentation of consultation with Ngāi Tahu. They requested a Cultural Impact Assessment to be completed prior to the application progressing. They also noted that that Canoe Creek is identified in the Regional Plan as having wāhi taonga, cultural materials and traditional campsite cultural values for Ngāi Tahu.

[122] The resource management perspective and aspirations of Ngāti Waewae are set out in chapter 1 of the LWP.

[123] The full text provides further detail, but I note that desired outcomes for Ngāti Waewae include that:

a. Existing wetlands are protected and degraded wetlands are enhanced; and

b. Water resources are managed according to the philosophy and principle of ki uta ki tai, including the unimpeded passage of water from mountain to sea; and

c. Discharges (point and non-point source) to water are avoided.

[124] These aspects of Ngāti Waewae's desired outcomes do not appear to be supported by the application in its current form, though I note the current absence of a cultural impact assessment and of a definitive set of outcomes from TiGa's ongoing consultation with Ngāti Waewae.

Groundwater, surface water and aquatic ecosystems

Existing environment

[125] The site can be characterised by having shallow groundwater and adjacent surface waterbodies.

[126] Groundwater is present at approximately 1m depth for much of the year, and as described elsewhere, this proposed operation relies on this level within the pit with groundwater being lowered by pumping.

[127] In regards to surface water, the site has three adjacent waterbodies:

a. To the north, the highly modified Northern Creek. This drain may have historically been a natural waterbody, albeit in a different location, but it now resembles a farm drain. It has been assessed as having a poor quality aquatic habitat.

b. To the south is Collins Creek which is characterised by a moderate to poor quality aquatic habitat. It has some riparian vegetation but it is still highly modified. My understanding is that Collins Creek also receives runoff form the site.

c. To the west is Canoe Creek Lagoon. The applicant has stated that they have not been able to access to this wetland, so there has been no assessment undertaken of its current state (refer to application para 3.66).

[128] Further south is the relatively unmodified Collins Creek which has a high quality aquatic environment. Springs close to the southern boundary of the site, used by the neighbouring landowner for stock water supply, appear to be hydraulically connected to Collins Creek.

[129] Mr Harding's ecological review (12 December 2023) noted the following about the status of the existing environment and the manner that this was assessed in the application:

a. The site sits within *"a landscape of largely undeveloped land: indigenous vegetation and wetlands to the north; extensive forest on the Paparoa Range to the east; Canoe Creek and the Langridge Scenic Reserve to the south; and, Canoe Creek Lagoon and the beach/sea to the west."* (para 31)

b. *"There is no indication that the ecological values of adjacent areas – or the wider Barrytown Flats coastal-plain ecosystem – were surveyed during the preparation of the AEE."* (para 32)

c. *"An extensive wetland-lagoon complex – Barrytown Flats-Canoe Creek Lagoon – is present to the north and west of the site. The northern part of this complex is scheduled as a Significant Natural Area (SNA) (Site PUN-W034) in the Proposed Te Tai o Poutini Plan. The southern part (Canoe Creek Lagoon) was originally included in this SNA, but has since been omitted from the presently-proposed SNA."* (para 34)

d. *"I viewed the vegetation adjacent to the lagoon at two locations during my site visit. Canoe Creek Lagoon, and its surrounding riparian vegetation and habitat, is ecologically significant."* (para 35)

e. *"Assessment of the potential adverse effects of the activity on terrestrial ecology is constrained by the lack of information in the* EEA *on indigenous biodiversity values on adjacent properties. It is further constrained by our limited understanding of ecological processes in the wider Barrytown Flats coastal-plain ecosystem."* (para 43)

[130] I agree with Mr Harding's characterisation and consequently, I consider that the starting point for assessing freshwater ecological effects is unclear.

Actual and potential effects on hydrology and aquatic ecology from normal operations

[131] The current assessment, as provided in the application, is problematic if the proposal will indeed cause hydrological and associated ecological effects on adjacent and nearby water bodies. In making this observation, I note the applicant's claim that the application is predicated on the idea that, principally, environmental effects on wetlands and waterbodies are to be avoided (application para 3.70). Mr Harding has also noted that the application considers an assessment of the adjacent waterbodies is unnecessary because effects are intended to be avoided. Both he and I reject that assertion.

[132] It may be possible to claim that, theoretically, if a "no effect" outcome is achievable and can be demonstrated as occurring (e.g. via suitable resource consent conditions), then it is not necessarily problematic that the environment as it stands currently has not been well characterised so far. However, in this scenario the question remains of how a consent holder could practically implement the operation whilst also demonstrating that no adverse environmental effects are occurring in the surrounding waterbodies. In my view, conditions to that effect have not been proposed to date.

[133] Nevertheless, even getting to this point is difficult as the relevant policy documents require a precautionary approach to be taken. This is because both the NPS-IB Policy 3 and NZCPS Policy 3 require a precautionary approach to be taken where uncertainty exists as to adverse effects on indigenous biodiversity and significant adverse effects on the coastal environment, respectively. Uncertainty is present because the application does not provide a detailed assessment of the current state of the Canoe Creek Lagoon, nor its sensitivity to the mining proposal, particularly in relation to water management activities.

[134] Mr Harding takes this view as well, and stated:

a. *"The EEA states closer survey of vegetation on the property adjacent to the northern boundary of the site is not necessary because the proposed activity will not affect biodiversity beyond the location of the activity and its buffer area. That is an optimistic assumption. It is also inconsistent with the obligations that "A precautionary approach is adopted when considering adverse effects on indigenous biodiversity," [NPS-IB Policy 3] and to "Adopt a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse." [NZCPS Policy 3]"*

[135] I agree with Mr Harding's assessment.

[136] In this situation, consent conditions could potentially provide a route to provide adequate protection against effects on the area's adjoining and nearby surface waterbodies. However, this would require (i) hydrological and ecological surveys of the wetland to be undertaken to set a baseline understanding of the existing environment, and (ii) the approval of a regime, following the grant of consent, that provides for that environment to be maintained within limits.

[137] Post-consent approvals are, in my view, to be avoided (especially on critical issues) as they essentially defer decision-making and circumvent the process of assessing and determining the application now.

[138] Alternatively, consent conditions setting out an adaptive management regime are also theoretically possible (and can be effective) is some circumstances. These regimes provide for operations to be adapted in response to effects observed or to changes to monitored parameters.

[139] An adaptive management regime is not likely to be appropriate in this case either, as the NPS-ID and NZCPS both require a precautionary approach to be adopted. By definition, adaptive management regimes are triggered after the breach of a threshold, by which point an adverse environmental effect will have likely already occurred. This cannot be considered "precautionary". An alternative may be to set the trigger thresholds conservatively, so that the operation is adapted before such effects occur. However, that approach would require a detailed assessment in advance of the state of the existing environment and its sensitivity, which has not been done in this case.

[140] An adaptive management approach, in my opinion, requires an assessment of the sensitivity and significance of the environment as it stands as starting point for assessing the acceptability of any change to that environment. In this case, that work has not been done and this presents a barrier to granting the consents being sought.

[141] Brett Sinclair, an expert in hydrogeology and with particular experience in mining environments, has reviewed the application. Despite the above, my understanding is that it is not clear to him (from a hydrological point of view) what the hydrological changes may occur to the Canoe Creek Lagoon.

[142] Mr Sinclair has stated, on page 1 of his review of the application (4 September 2023), that *"the depletion effects on the [Lagoon] are effectively self-managed as water not used to manage groundwater drawdown along the northern and southern edges [by reinjection to infiltration trenches] is to be discharged, following treatment, to the lagoon."*

[143] By this I understand that depletion will occur via the hydraulic gradient brought about by dewatering, but this is counteracted by the discharge directly to the wetland.

[144] This may be achievable from a hydrological perspective, and I do not disagree with his expert position on this. However, to me, it seems that a balance between the groundwater taken and the water discharges to land or water may be required if water levels in the adjacent wetland

are to be appropriately managed and maintained. This balance needs to provide for all of the following:

a. the need for dewatering

b. the need for re-injection at controlled rates and volumes to maintain flow in adjacent streams

c. the need to operate within finite storage capacity of the Water Management Facility

d. the need to operate variable stored volumes of extracted water and process water, whilst simultaneously maintaining treatment capacity and performance

e. the need, from time to time

   i. to discharge to the wetland, or

   ii. to avoid discharging to the wetland, and

   iii. to know when to do each and be ready for this (with either stored and treated water to discharge, or with storage capacity to avoid discharges)

   so as to maintain the wetland's hydrological function, and

f. the need to account for natural changes in water level associated with the freshwater environment and the coastal environment.

[145] From a planning perspective, I would expect that any consent would be granted in the basis that these variables can demonstrably be balanced so that the wetland is indeed maintained within acceptable limits. Theoretically this could be achieved through consent conditions that prescribe appropriate management parameters, in terms of environmental standards or limits, for dewatering, re-injection, treatment and wetland hydrology. In practice this may be too complex to achieve and show compliance, and I do not consider that presently, as the application stands, there is a sufficiently clear picture of how this is to be achieved.

[146] I note also that the applicant has not been able to arrange for access to the wetland, but ongoing access will be necessary if the resource consent is granted.

Assessment: Regulation 45D of the NES-F

[147] Regulation 45D(6) of the NES-F, that applies to quarrying activities seeking resource consent under r 45D, sets out a threshold test that must be passed before a consent application can be considered for approval. This regulation states:

(6) A resource consent for a discretionary activity under this regulation must not be granted unless the consent authority has first—

(a) satisfied itself that the extraction of minerals will provide significant national or regional benefits; and

(b) satisfied itself that there is a functional need for the extraction of minerals and ancillary activities in that location; and

(c) applied the effects management hierarchy.

[148] All three elements of the test must be applied and passed before a resource consent can be considered for possible approval.

[149] Regarding (a), the applicant has provided an economic assessment which sets out the regional benefits of the activity. This has been peer reviewed and the economic benefits are not disputed.

[150] Regarding (b), to pass the test the consent authority needs to be satisfied that there is a *"functional need"* for the quarrying activity *"in that location."*

[151] Functional need is defined in the NPSFM as: *"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."*

[152] Context for what constitutes a functional need can also be taken from the National Planning Standards definition of an "operational need" which is defined as: *"the need for a proposal or activity to traverse, locate or operate in a particular environment because of technical, logistical or operational characteristics or constraints."*

[153] In determining whether this proposal has a functional need, I consider the following logic needs to be followed:

a. Ask what the activity is. This requires adequate characterisation of the activity and the environment in which is occurs, such as *"quarrying for mineral ore extraction purposes on lowland coastal mineral sand deposits";* and

b. Ask whether this activity can only occur in "that environment" (as per NPSFM) – which I interpret as a question of exclusivity. E.g. *"Can quarrying for mineral ore extraction purposes occur only on lowland coastal mineral sand deposits?"*

c. If the answer to b. is yes, then ask, under the NES-F Regulation 45D(6), the narrower question of whether this activity can only occur in *"that location."*

d. This is question of whether, of all the instances of "this environment" (lowland coastal mineral sand deposits) this particular activity (quarrying for mineral ore extraction purposes) can only occur in this particular location (the Barrytown Flats adjacent to the Canoe Creek Lagoon). Relevant to this consideration will be matters relating to the scope for the same or similar mineral extraction elsewhere. An assertion that an activity "can only" only occur there is the same as the assertion the activity cannot occur elsewhere. This relates, potentially, to broader questions than the mere presence of the mineral sand here; also to the possibility of extraction from other locations if they exist.

[154] The relevant part NES applies only to activities within a wetland or within 100 m from one, so I have taken "that location" to mean the space within that 100 m setback and the wetland itself. "That location" cannot mean any other location as outside of that margin and outside of the wetland r 45D of the NES does not apply.

[155] This test requires applicants to undertake a somewhat refined assessment of alternatives, ideally from first principles: Can the end use of the desired minerals be achieved by other means? If not, can the desired minerals be acquired from another type of environment? If not, can the desired minerals be acquired from this type of environment in another location? What justification is there for that being the case? (Why is there a need for their extraction from this particular location only?)

[156] I refer, as above, to the distinction between a functional need and an operational need. There may well be operational needs that would be satisfied by operating from this site. However, the NES-F's requirement for there to be a functional need, in my assessment, is clear: it requires that the extraction of these minerals can only occur by quarrying at this location.

[157] The applicant's assessment of alternatives is limited and does not address the matters listed above in paragraph [153]. However, I do note (anecdotally) that there are other proposals in development for equivalent mining at other locations in the region, and that the sand deposits in question are thought to be relatively homogenous. Prior consents have been granted for similar mining at other coastal locations in the region.

[158] This being the case, in my assessment it cannot be possible that extraction of these minerals is only possible by quarrying at this site.

[159] By this logic I cannot see that the application passes the functional need test in Regulation 45D(6) of the NES-F. The application must be declined on that basis.

[160] The only possible alternative outcome is for the consent to be open for consideration because either:

a. The application is altered to ensure that Regulation 45D does not apply (which will require hydrological and ecological expertise to determine), or

b. There is authority to interpret Regulation 45D differently (or conceivably other provisions relating to "functional need"). I am not currently aware of any such authority, or

c. Regulation 54 applies.

The case that there is a "functional need" for the activity in this location

[161] There is a chance that it can be demonstrated that a functional need exists in this case. This would require the applicant to show that there is a functional need to undertake these activities in "that location" – meaning within the 100 m setback of the wetland and within the wetland itself. As set out above, this means showing that the activity "can only occur" here.

[162] In my view, this would require the application to justify more than the presence mineral sand as justification for the functional need to extract it.

[163] To establish whether these activities <u>can only occur</u> in this location, the following types of questions would need to be asked and answers similar to the following would need to be given and justified:

a. How common is this type of environment? (an accessible mineral sand resource): Uncommon

b. What are the types, form and commercial demand for the minerals present?: They are of a type and form that is characterised by a particular commercial use that is otherwise difficult to satisfy

c. What is the state of knowledge around the presence of similar mineral deposits elsewhere?: Poor

d. Generally, what is the current status of investigations on those deposits?: Not significantly advanced

e. In general what is the likely timetable, cost, method, expertise required and chance of success in prospecting sites and investigating their commercial viability?: These answers would need to show that prospecting for new sites is relatively difficult

f. Generally, what is the current status of mining licences for those deposits?: There are few or none

g. What process is required to establish access agreements, leases or ownership of sites where those deposits are present?: This process would need to be shown to be difficult

h. Have access agreements, leases or ownership of sites been established elsewhere, and is this possible for other sites?: None currently and the possibility for other sites appears doubtful

i. Generally, what is the current status of resource consents and resource consent applications for sites where there are prospecting licences, mining licences and access arrangements progressing?: None are advanced

j. In general what is the likely timetable, cost, method, expertise required and chance of success in preparing resource consent applications for extraction of these minerals in this type of environment?: Long, costly, and difficult enough to threaten commercial viability

k. In general, how is this location similar or different to other sites:

    i. Where prospecting has shown a commercially viable deposit is present?

    ii. Where mining permits have been granted?

    iii. Where resource consents have been granted?: There would need to be no similar sites.

[164] These types of answers to these or similar questions could show that the works proposed can only occur in this location (within 100 m and within this wetland), by virtue of the fact it cannot reasonably occur elsewhere.

[165] This type of assessment of alternatives, showing there is no reasonable alternative, I consider is necessary if the applicant is to show the parts of their proposal within 100 m of the wetland can only occur there.

Relevance of Regulation 54

[166] The applicant may advance an argument that r 54 of the NES-F applies in the event that no functional need can be shown under r 45D(6). Regulation 54 covers the same scope of activities as r 45D and is the same subpart of the NES-F. It states: "the following activities are non-complying activities <u>if they do not have another status</u> under this subpart" [emphasis added]

[167] I do not consider that r 54 can apply because it is clear that r 45D is the relevant regulation. Regulation 45D states throughout subparts (2) to (5) that "[the activity] within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if [the conditions of that subpart are met]"

[168] The requirement for a functional need to exist is present elsewhere, in r 45D(6).

[169] This means, in my assessment, that r 45D(6) is a condition under which a consent must not be granted, not a condition to be met for the for the activity to remain a discretionary activity.

[170] Therefore the application is discretionary regardless of whether a functional need exists, and it cannot alternatively be considered as a non-complying activity under r 54 because of the absence of a functional need.

Effects management hierarchy

[171] If the Commissioners are satisfied that there is a functional need to undertake the activity in this location, the effects management hierarchy must also be applied as per Regulation 45A(6)(c). This is set out in the NPSFM and is self explanatory:

> *effects management hierarchy, in relation to natural inland wetlands and rivers, means an approach to managing the adverse effects of an activity on the extent or values of a wetland or river (including cumulative effects and loss of potential value) that requires that:*
>
> *(a) adverse effects are avoided where practicable; then*
>
> *(b) where adverse effects cannot be avoided, they are minimised where practicable; then*
>
> *(c) where adverse effects cannot be minimised, they are remedied where practicable; then*
>
> *(d) where more than minor residual adverse effects cannot be avoided, minimised, or remedied, aquatic offsetting is provided where possible; then*
>
> *(e) if aquatic offsetting of more than minor residual adverse effects is not possible, aquatic compensation is provided; then*
>
> *(f) if aquatic compensation is not appropriate, the activity itself is avoided*

[172] The application states that the effects management hierarchy has been applied and that the intention of the works is to avoid effects.

[173] It is not clear how this is known or how this will be ensured if the resource consent is granted, as access has not yet been made to the Canoe Creek Lagoon for the purpose of assessing effects on it, and it is not clear whether that will be possible in the future.

Summary

[174] As it stands, in my assessment the application fails under Regulation 45A of the NES-F. On that basis, I have not considered the application against the other planning instruments as they relate to freshwater management.

[175] As I understand it, the applicant intends to put forward evidence that addresses questions I have posed above relating to functional need. I will respond to those at or before the hearing.

<u>Hydrological and aquatic ecosystem effects arising from pit wall collapse</u>

[176] A series of potential environmental effects, which are principally hydrological and ecological effects, could occur in the event of a pit wall collapse suitably close to a surface water body. Brett Sinclair (has raised this possibility in his appraisals of the application. As I understand it, this possibility involves a sequence of events characterised by:

a. Potentially incorrect geotechnical appraisal of ground conditions

b. Potentially incorrect hydrological appraisal of the effect of dewatering and reinjection on ground conditions

c. Potentially incorrect engineering design of the pit wall

d. Unidentified or unrecoverable pit wall stability issues

e. Collapse of the pit wall into the mine void

f. Loss of stability of surrounding land

g. Excess flow, and possibly unrecoverable flow, of groundwater and possibly surface water into the mine void

h. Incision and collapse of land caused by flowing water

i. Eventual diversion of a stream or a wetland into the mine void

[177] If this were to occur, in addition to the issues for the operation of the mine, there is the potential for significant adverse effects on surrounding surface waterbodies, and the values associated with these waterbodies as a result of the long term, and potentially permanent diversion, of a surface water body into the mine.

[178] This is a potential occurrence, and whilst I acknowledge it is intended to be avoided, should this occur its effects have not been considered. Its possibility engages a series of policies seeking to avoid effects of rivers and wetlands, such as clauses 3.22 and 3.24 of the NPSFM, which seek to avoid the loss of extent of wetlands and rivers.

[179] Despite this I understand TiGa has, since the application was lodged, been conducting further technical work relating to groundwater transmissivity, geotechnical stability of the source deposits, and the effect of groundwater recharge on this stability. This relates to the ultimate design of the pit wall and its stability. At the time of writing this report, WCRC is yet to have access to that work.

[180] I have noted above that the mining sequence takes this risk into account to some extent by proposing the works are undertaken away from waterbodies in the first instance. This may allow hydrological and geotechnical knowledge of the site to be refined, such that the sequence of events described above is avoided.

[181] To ensure that sequence of events is avoided, I would recommend (as a minimum) that resource conditions would require the consent holder to demonstrate the risk of pit wall collapse is suitably low before being able to proceed with Panels 6-10 (or otherwise, before being able to excavate within a distance that risks diverting surface water following a pit wall collapse).

[182] This is best implemented with an adaptive management regime and/or contingency procedures contained in the site's management plan. In the context of the consents being sought from WCRC, this could be constructed as follows (as an illustration):

a. Condition A allows for mining up to X metres from surface water bodies [a close setback]

b. Condition B states that if the applicant cannot demonstrate under Industry Standard X that pit wall collapse resulting in the diversion of surface water into the pit is not a risk, then Condition C applies.

c. Condition C allows for a mining up to X metres from surface water bodies [a conservative setback, that avoids the risk of a pit wall collapse diverting surface water]

[183] This is necessarily illustrative as TiGa has not proposed an approach to the management of this potential effect at this stage.

[184] This approach requires agreement to be reached between technical experts on the parameters and their standards to be set out in conditions A, B and C. It also relies on technical agreement on the suitable setbacks between mining and waterbodies where conditions A, B and C are met and not met.

[185] An alternative, is for a consent to provide for a post-approval, such as *"the setback of any mining from surface water shall be no less than X metres unless otherwise approved by the West Coast Regional Council."* I do not support this approach as post-approval conditions are ultra vires, as well as providing no certainly for the consent holder, the consent authority or the community over the conditions under which approval may be given or withheld. They also circumvent the current public decision making process by deferring it to a later stage.

Dust emissions and air quality

Existing air quality environment

[186] Existing air quality in the Barrytown area is understood to be generally very good, with the environment characterised by few emissions sources, relative lack of dry conditions that support dust emissions, and a common westerly airflow off the sea.

[187] However, TiGa has recognised its potential to emit dust in breach of permitted activity standards and has applied for a resource consent accordingly.

Actual and potential effects of dust emissions on the environment

[188] The application includes a dust management plan which seeks to manage dust emissions in an integrated manner, principally by preventing emissions. This has been peer reviewed and no issues have been raised.

[189] In my experience as a planner and as having had a previous technical background in air quality, my understanding is that (a) control of emissions is key to the management of effects, and (b) there are usually technical solutions to management problems – meaning that, if the desire is there to do so, consent holders can usually manage dust effects by deploying site-specific and appropriate measures.

[190] In this case the site will have large volumes of water present. I understand Pond 4 is to be the source of clean water that can be used by water carts and other infrastructure as needed to suppress dust.

[191] Implementation of the dust management plan and inclusion of resource consent conditions on a discharge permit, to prevent offensive and objectionable effects beyond the boundary, are standard and should be sufficient in this instance to adequately manage dust effects.

Submissions on dust and air quality effects

[192] Several submitters expressed their concerns about dust generation from the site, for example M Serban, C Cromey, the Barrytown School Board of Trustees (BSBT), S Langridge, F McDonald and A Goddard. All except for the BSBT seek the application to be declined on this basis (among other reasons).

Consideration of planning context

[193] I agree with the planning assessment in the application as it relates to air emissions and dust management.

Summary of dust and air quality effects

[194] Whilst dust and air pollution effects (as well as associated amenity effects) are potentially unacceptable in cases of quarry developments, in this case I consider that the dust management plan, if implemented and enforced, is adequate to ensure these effects are acceptable.

Radiological effects

Existing radiation environment

[195] I understand ionizing radiation in the vicinity of the site is at background levels, with no sources of ionizing radiation nearby (notwithstanding the currently undisturbed mineral sand deposits subject to the application).

Actual and potential effects of ionising radiation on the environment

[196] The extraction and processing of mineral sands is expected to bring about a discharge of ionizing radiation from the processed material at the site and during its transport off the site. These are discharges to land, water and air.

[197] However, whether this falls within the remit of the RMA depends on whether the discharge is a contaminant. If it is, then the LWP and the AQP apply and resource consent is required.

[198] Mr Arduin has reviewed the applicant's radiological assessment and, at the time of writing, has not been able to determine

a. whether samples of material taken from the site are representative of the radiological properties of the mineral ore

b. whether the analytical method used to determine the samples' radiological properties was appropriate

[199] My understanding, at the time of writing this report, is that the applicant is addressing this issue (potentially by re-sampling and analysing these with a different method) and that radiation experts currently discussing these areas of uncertainty.

[200] Consequently I will be in a position to provide supplementary planning advice, at a later stage, once further information and expert opinion is available.

Submissions on radiation discharges

[201] At least 34 submitters raised concerns about emissions of radiation. I acknowledge those concerns, especially as they relate to the connected issue of dust discharged from the site and deposited, particularly if visibly on surfaces.

[202] As I understand it none of those submitters have engaged experts on the matter, so I am not in a position to evaluate their suggestions within the context of the planning documents.

Significance of effects – consideration of planning context

[203] The regional planning framework captures ionising radiation (where it is a contaminant) as discharge under 'catch all' rules which are not supported by specific policy direction.

[204] There is no further direction provided by superior planning documents.

[205] As a result, at this stage, I am not in a position to provide useful analysis or advice, and will not be able to do so until technical advice on the radiation discharges has been received.

Effects on climate change from the emission of fossil fuel combustion discharges

[206] The climate-changing effects of fossil fuel emissions of greenhouse gases are now within scope for potential consideration at s104 of the RMA. Carbon dioxide is a stock pollutant that accumulates in the atmosphere over time and, cumulatively, brings about an effect on climate. These emissions should therefore be considered as contaminant discharges under the RMA and their effects should be considered.

[207] Fifty submitters oppose the application on the basis of climate-changing emissions.

[208] The scope for assessment below is limited by s15, which controls emissions to air from industrial and trade premises. Other emissions to air are permitted activities unless otherwise stated (the AQP and other instruments are silent on the matter).

[209] This means only those emissions occurring from the site are within scope; emissions arising (for example) from the off-site transport of materials or from their end-uses are not within scope. The following paragraphs are predicated on the notion that greenhouse gas emissions from the site are relevant considerations, noting that these emissions will (to my understanding) occur only from excavators and similar machinery noted in the application. The processing facilities themselves will not produce emissions. It is possible that transport emissions from within an industrial and trade premises are not for consideration, but I have not been able to find relevant legislation that confirms this.

[210] On this matter I made the following observations, made in the general absence of helpful planning documents on the matter:

[211] New Zealand has committed to a net-zero emissions regime by 2050. However, the proposed consent, if granted, would expire or lapse before 2050. Whilst progress towards achieving that target is relevant context (and could be considered an other matter under s104(1)(c)), granting or refusing this consent will or not affect whether the target is met or not.

[212] Nevertheless, as stated above, the effect of emissions is cumulative. Whilst the individual effect of these emissions are not known and likely indecipherable from the effect of emissions at large, all emissions contribute to the cumulative effect.

[213] The WCRC and central government have not yet developed a policy position that helpful assists decision makers on small scale emissions such as those associated with this site.

[214] To date, under the RMA, the only policy position on process heat emissions has been developed. In short, that policy position is to prevent avoidable emissions by adopting the best practicable option for process heat supply.

Section 104B—108A

Section 104B – Determination of discretionary activities

[215] An application for a discretionary activity may be granted with conditions or declined.

[216] As it currently stands, in my assessment, the application must be declined as there is no pathway for granting it under Regulation 45A of the NES-F.

[217] This assessment is subject to change for the reasons set out above in paragraph [147] to [165], which would require either

a. a change to the application (likely a greater setback from the Canoe Creek Lagoon and avoiding any discharge into it, to avoid any hydrological effect on it), or

b. authority from which Commissioners could conclude there is a functional need for the activity to occur in this location

[218] Aside from this recommendation, consent conditions have been proposed by the applicant. At the time of writing this report, arrangements are being made for planning experts to engage in caucusing on these conditions.

Section 108A – Bonds

[219] If consent is granted I recommend a bond is imposed.

[220] Under section 108A(2)(e) the value of the bond can be "as the consent authority thinks fit."

[221] As I understand it normal procedure for the calculation of bond values is for

[222] Conditions of the potential resource consent are set

[223] Those conditions subject to the bond are identified

[224] At least two expert are engaged to provide cost estimates to provide security to the local authority on the performance of the conditions

[225] The average of the two (or more) values is taken as the starting point for the value of the bond.

Section 123 – Duration

[226] If granted, the requested duration of 12 years appears to be appropriate.

Section 125 – Lapse

[227] A standard lapse period of 5 years appears to be appropriate.

Section 128 – Review of consent conditions by consent authority

[228] Review conditions are proposed by the applicant and are subject to discussion in expert caucusing.

Recommended conditions

[229] A suite of resource consent conditions is subject to expert caucusing being arranged at the time of writing of this report. It is my intention to table refined and ideally agreed, conditions of consent at the hearing or before.

Dr Michael Durand

Consultant Planner