

Otago Regional Council
Private Bag 1954
Dunedin

Attention: Charles Horrell

Dear Charles

Proposed OceanaGold Coronation North Project, potential effects on ground water at the Kinney Property

1 Introduction

As requested by you, please find attached some comments on the potential impact of changes to the ground water regime at the Kinney property as a consequence of the proposed Coronation North Pit (CNP) project.

Mr David and Mrs Jocelyn Kinney advise that their property contains numerous springs; and this ground water source provides stock water that is of critical importance to them and their business.

The Golder report¹ included in the assessment of environmental effects indicates, at the location of the proposed CNP, the estimated height is 165 m from the pre-mining groundwater table at 640 mRL to the base of the proposed pit at 465 mRL. That is, there will be local reduction in ground water of about this depth when the mine is operating at its maximum depth. Golder also advise a pit water level of 467 m RL. Figure D3 included in the Golder report titled "Coronation North Pit Groundwater Area of Influence" illustrates Golder's estimates of the impact on the ground water table, both while the pit is operational and post closure. This figure is attached, note that the Coal Creek tributaries illustrated on Figure 1 are also shown on the Golder Figure D3.

The proposed CNP is significantly lower than the consented Coronation Pit and the proposed Coronation Pit Stage 5 i.e. potential effects on ground water from the CNP are expected to be greater than for the Coronation Pit and the proposed Coronation Pit Stage 5.

2 Kinney property location

The Kinney property is located north-west of Four Mile Road and east to south-east of Mareburn Road; the distance is approximately 4 km from the proposed CNP pit to the closest point on the farm. Figure 1 following illustrates the locations. A Golder drawing shows the approximate distance from the proposed CNP to the south edge of the Kinney property is from 5.5 km at the 460 mRL contour. The property of interest mostly faces north-west and rises from an approximate elevation of 300 mRL near the Taieri River to a height of about 670 mRL adjacent to the top of the property.

¹ Golder Associates; Coronation North project, Groundwater Assessment, Report Number: 1545831-002-R-Rev2; 13 May 2016.

Approximately a little under half the Kinney property is below the 460 mRL contour i.e. lower than the depth of the pit base at its deepest point.

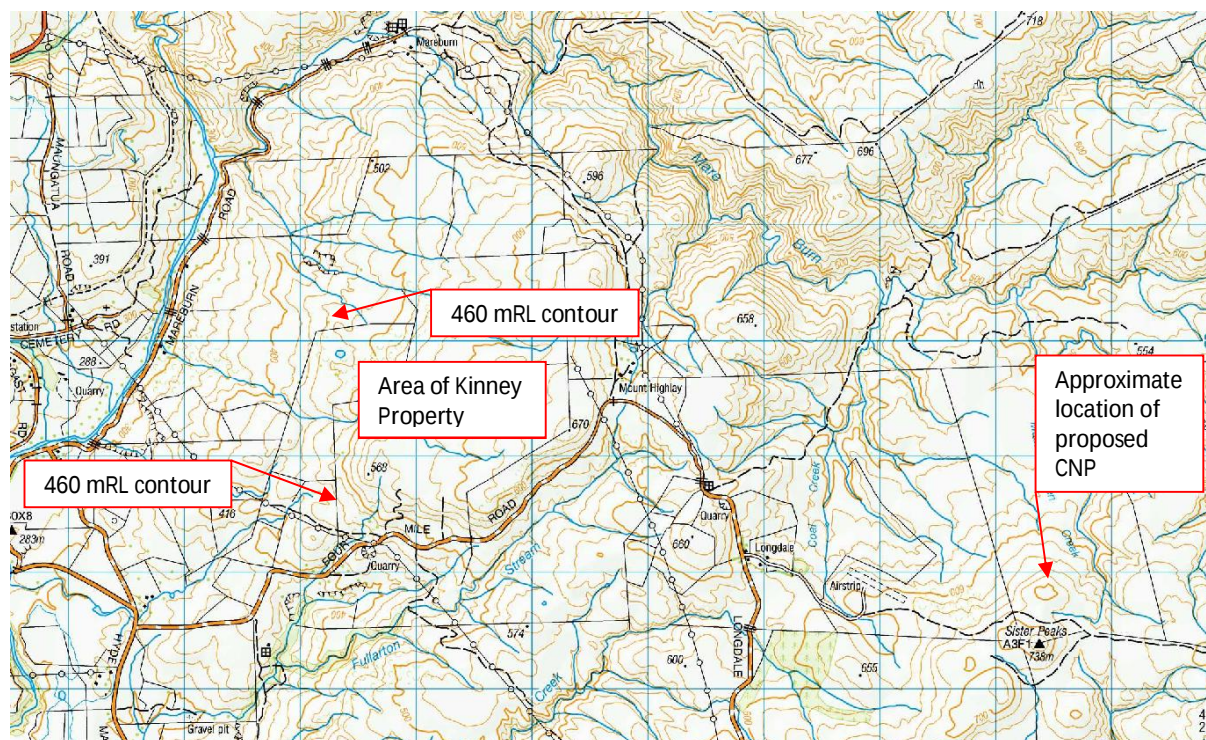


Figure 1 Location of Kinney property relative to proposed CNP (scale -one blue square is 1 km)

Mr and Mrs Kinney advise:

- 1 Most of the springs are located on the lower slopes.
- 2 The springs can dry up following prolonged dry periods.
- 3 Rock underling their property comprises basalt whereas the proposed CNP pit is within schist.

Ground water contours provided by Golder indicate ground water flow from the proposed CNP location is northwards towards the Mare Burn. Coal Creek, a Mare Burn tributary is located down slope of the proposed CNP between the proposed CNP and the Kinney property. Figure 1 shows that Coal Creek is generally below 500 mRL directly between the proposed CNP pit and the Kinney property.

The Mare Burn flows north-west from the proposed CNP pit and around the north of the Kinney Property to the confluence with the Taieri River. The ground slopes down from the proposed CNP pit to Coal Creek, a tributary of the Mare Burn. Most of the Kinney property is outside the Mare Burn catchment. A part of the Kinney property is within the Mare Burn catchment but this tributary joins the Mare Burn close to the confluence of the Mare Burn with the Taieri River.

3 Discussion

The following comments can be made in relation to potential impacts on springs emerging within the Kinney property as a consequence of the proposed CNP development:

- 1 The Kinney property is significantly beyond the “maximum operational area of (groundwater) influence” provided by the applicant and attached to this letter. The Kinney property is several kilometres from the proposed CNP whereas the advised “maximum operational area of (groundwater) influence” is several hundred metres from the proposed CNP. The Golder

Appendix D is silent insofar as the precision of their analyses are concerned and we have assumed that it is appropriate to use these data to consider the potential effects on ground water at the Kinney property given the relative distance of the property and the zone of influence from the proposed CNP pit.

- 2 A significant portion of the Kinney property is below 460 m RL, this is lower than the minimum elevation of the pit base at its maximum depth. We understand that OceanaGold do not propose to dewater below the base of the pit. Consequently, it is very unlikely that springs below 460 mRL will be adversely effected by the advised dewatering regime. We understand that most of the springs of interest to Mr and Mrs Kinney are on the lower slopes of their property.
- 3 It is likely that Coal Creek intercepts ground water, including some ground water from the proposed CNP area. It is very unlikely that water incepted by Coal Creek can emerge from springs within the Kinney Property.
- 4 There may be some reduction in baseflow in the Mare Burn as a consequence of dewatering associated with the CNP. However, it may be expected that at present this water would flow around the Kinney property, and is very unlikely to be ground water emerging from springs within the Kinney Property.
- 5 The basalt geology underlying the Kinney property differs from the schist at the proposed CNP site. The basalt has been deposited over the schist.

Based on the comments and discussion, we consider that the probability is low of the described dewatering activities associated with the proposed CNP adversely impacting on ground water emerging from springs within the Kinney property.

Our discussion is based on phone discussions with Mr and Mrs Kinney and qualitative evaluation of the Golder work provided to T+T by ORC. No detailed review or independent quantitative analyses have been undertaken to confirm the accuracy of the Golder work that these comments rely on.

4 Recommendations

The Golder report does contain various limitations. On this basis, and given the basis of our comments, we recommend that the Applicant confirms that the potential effect at the Kinney property as a consequence of the proposal is not more than minor.

One or more ground water monitoring bores could be installed outside of the advised “maximum operational area of influence” in order to confirm that the ground water level is unaffected by dewatering operations. If included as a resource consent condition, a suitable level of base line data is recommended prior to dewatering. It may be appropriate to limit dewatering if ground water levels measured in monitoring bores beyond the advised “maximum operational area of influence” respond to dewatering activities associated with the development.

5 Applicability

This report has been prepared for the exclusive use of our client Otago Regional Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:

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pp.....

Tim Morris

Gordon Ashby

Senior Civil Engineer

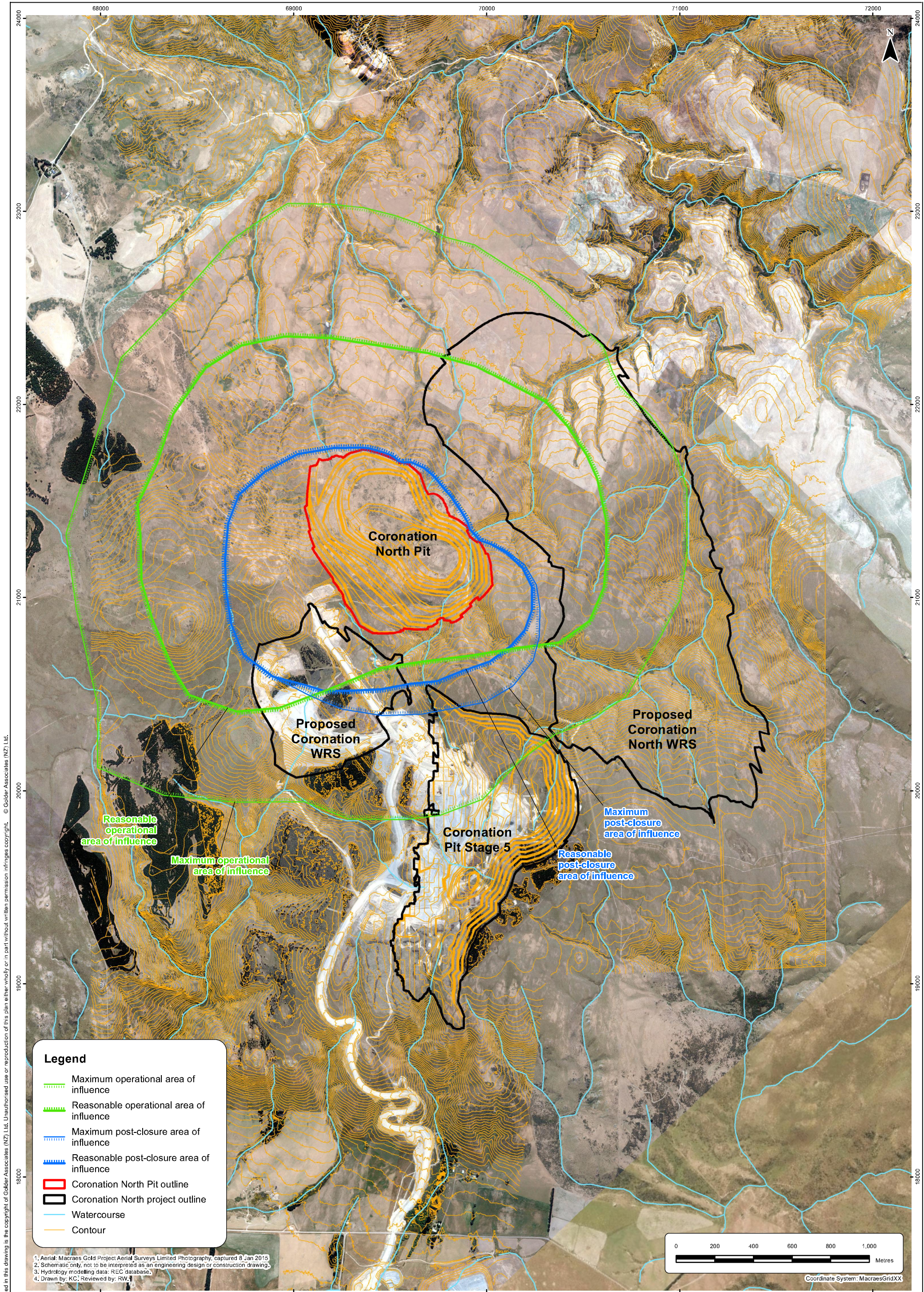
Project Director

tgm

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Appendix A: Figures

- Golder Associates Figure D3 – Coronation North Pit Groundwater Area of Influence (May 2016)



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TITLE |

CORONATION NORTH PIT GROUNDWATER AREA OF INFLUENCE

PROJECT | MAY 2016
1545831

D3