

CGW Ref: 18360-LETGEO-001-A

Date: 29 October 2019

Nelson City Council
110 Trafalgar Street
Nelson, 7010

Attention: Susi B.Solly

Dear Susi,

RE: 18360 – 205 Lud Valley Road Subdivision Request for Further Information Response

1. Introduction

CGW Consulting Engineers (CGW) was engaged to address three relevant items within the Nelson City Council (NCC) request for further information (RFI) for RM195191, dated 19 September 2019. CGW completed a Site Suitability Report, dated 25 October 2018 for the proposed development at 205 Lud Valley Road. The context of our investigations and reporting was for the purposes of identification of natural hazards and the mitigation of these hazards (as per resource consent) likely to occur on the site. From the report we suggested the following geotechnical conditions:

1. Slope stability analysis required to be undertaken on critical sections through the proposed build areas prior to building consent being issued
2. Proposed buildings for the development not to be located within the gully at the southern extent of the site or on the steep slopes in the north western corner.
3. An accurate survey of the site to be completed to aid with detail design of the access and proposed earthworks to the site.
4. Specific foundation design recommended in conjunction with the slope stability analysis.
5. Earthworks to be undertaken in accordance with NZS4431:1989 and NZS 4404:2010. If material excavated from the site is to remain on the site, it is to be retained behind a engineered retaining structure, where thickness is greater than 0.5 m.

Consulting Civil, Structural, Environmental & Geotechnical Engineers

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2. RFI Response

The following items are addressed from the RFI below:

2.1 Earthworks & Proposed Building Areas

Item 6: The CGW report provided envisages that major earthworks will be required to construct the access and proposed development and recommends slope stability analysis is undertaken. It is likely that the proposal would also require a further resource consent. It would be prudent to add this to your current application. Alternatively, you would need to need to obtain a separate consent at a later stage. Please address and advise how you wish to proceed.

CGW Response: We note that a separate earthworks consent may be required and assessment of cut and fill stability may be required, but all of this is dependant on the actual design layout which is, as of yet, not defined. We recommended that this is carried out in conjunction with building consent.

2.2 Water Discharge

Item 15: The CGW report states 'it is proposed that sub-surface pressure compensating drip line is used to distribute treated eluent installed at 1 m intervals perpendicular to the slope'. 1m interval is a typical line spacing – please provide an assessment from your geo professional whether this should be increased, given the steep slope of the disposal area.

CGW Response: We have recommended the effluent treatment and distribution system is subject to specific design. The existing slope has been taken into account in our suggested drip line spacing of 1 m and the associated reduction in application rate by 50%, in order to mitigate effluent application risk.

We also recommend that steep portions of the slope (>35%) are avoided. In this regard we note that Flow Environments Ltd have increased the available area within which a specifically designed effluent distribution system may be laid out. This increased area is positioned on the less steep portions of the site.

2.3 Geotech

Item 16: CGW plan highlights shallow instability is present within the upslope area of the proposed disposal fields location. The CGW report also describes the area as waning slope with several undulations. Review of TP2 log, located in the disposal field describes the presence of high plastic materials. The report states that no ground water was encountered, however TP2 log describes soils encountered to be wet above the contact with bedrock. All the above information is an indication the

area has a history of slope instability and would be very sensitive to change of site conditions.

- a. Please provide commentary from you Geo-professional that address the concerns raised above as to the suitability of the area for installing a disposal field.*
- b. If the area is still deemed a suitable location for installing the proposed disposal field, please provide the following:*
 - i) A geological cross section through the steepest section for the proposed disposal field. The cross section should extend up and down the slope to capture the crest and toe.*
 - ii) Results of slope stability analysis and commentary from the Geo-professional.*

CGW Response: We acknowledge the concern raised over slope undulations and these have been noted in our reporting. We also note that the TP2 log identified a higher percentage of gravel material amongst the high plasticity (clay-like) material in an overall approximately 2.0 m thick horizon of colluvium with gravel and very stiff clayey silt. Unsurprisingly water was noted at the bedrock interface as noted in TP2 log.

Apart from surface observations, scale testing indicates increasing penetration resistance with depth and residual shear vane readings of 15 kPa suggest that these areas may be subject to shallow soil creep in the upper soil layers due to prolonged wet periods and should be avoided.

If the area was 'very sensitive to change of site conditions', as suggested in the RFI, that sensitivity would have already become apparent following sustained rain storm events with rainfall water application rates far in excess of the effluent application rate. We have recommended the need for avoidance of the steeper areas and given the increased area available for effluent distribution on the lower slope, we consider the actual design is now less constrained and it should be easier to avoid impacting steep portions of the slope.

We have recommended that slopes over 35% should be avoided and that specific design should be undertaken as part of the building consent stage.

Please contact the undersigned if you have any further questions regarding this RFI response.

Yours faithfully,

Prepared by



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Reviewed by



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