



Appendix C Stantec UK Limited Letter

Vaynor Quarry ROMP Addendum

Quarry Development Scheme

Heidelberg Materials UK

SLR Project No.: 407.013404.00001

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Stantec UK Limited
New Zealand House, 160-162 Abbey Foregate
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Project/File: 331201231L004

Heidelberg Materials UK

Joe Napthine

By e-mail

Dear Joe Napthine,

Reference: Vaynor Quarry ROMP - Hydrogeological perspective of above water table working

In support of the current ROMP application for Vaynor Quarry, Heidelberg Materials UK ("Heidelberg") has produced a series of quarry development plans for above water table working. The current versions of these plans are all dated June 2025 and comprise two sets, one running from V6/PR/MT/6.0 to V6/PR/MT/6.8 and the other from V6/PR/BBNP/6.0 to V6/PR/BBNP/6.8 (second set).

In March 2024 (email from Mark Frampton to Richard Holtham of 27th March 2024) Heidelberg requested that Stantec consider the version of the development plans which had been provided to Natural Resources Wales (NRW) for consultation and requested Stantec to comment from a hydrogeological perspective on the plans and the consultation response received from NRW. This was subsequently undertaken and the outcome provided in an email from Stantec to Heidelberg on 9th May 2024.

Heidelberg has now requested that Stantec review the comments it provided on the 9th May 2024 against the current versions of plans (as referred to above) to ensure that:

- they take account of any changes from those plans on which NRW commented; and
- water-related information shown on them is appropriate.

Stantec has completed this review and can confirm both that the comments made 9th May 2024 are equally applicable to the current version of the development plans and that water-related information shown on them is appropriate. In particular, it should be noted that the geometry and elevation of water bodies shown on the plans has not changed between the current plans and those provided previously for consultation.

For completeness, the comments provided by Stantec on the 9th May 2024 are reproduced below:

- Our opinion is that once water enters the unsaturated zone it is likely to move in a dominantly vertical direction. There may be a minor horizontal component, but we cannot quantify what that is with the available information. Once infiltrating water reaches the saturated zone it moves dominantly horizontally in the direction of the groundwater gradient.
- Rainfall or runoff that infiltrates at a particular location is therefore likely to reach the saturated aquifer in broadly the same position irrespective of whether or not that location has been quarried. The relatively small horizontal component of unsaturated flow means that there will be a narrow margin beyond the quarry faces where infiltrating water will exit the quarry face (i.e. the observed seeps) rather than flowing vertically parallel to it.

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- Due to the large areas of exposed flat bedding planes and the likely infilling of fractures in the quarry floor, for a given location there will be more runoff (and less infiltration) in the quarried state compared to the pre-quarried state. The increased runoff rate means that this water will be diverted from where it would have originally infiltrated pre-development and instead infiltrate where it collects within the quarry. There will therefore be a redistribution of recharge in quarried areas.
- At present, runoff generated within the catchment of the western arm of the quarry drains to a slight depression at the southern end of the western arm with an overspill point to the south which is at an elevation of approximately 301.8 mAOD. Runoff collecting in this depression is understood to infiltrate back to ground, recharging the groundwater vertically beneath. Runoff generated in the catchment of the eastern arm collects in the existing pond in the south-eastern end of the quarry and infiltrates in a similar way. The overspill point for the south-eastern pond is several metres higher than the pond level at an elevation of approximately 280 mAOD.
- The quarry design would retain the south-eastern infiltration pond and would also incorporate an east-west orientated infiltration area at the southern end of the western arm within which runoff would be retained through retention of a buttress of rock at its eastern end. This feature first appears on the 15 Year plan prior to the breakthrough between the two arms of the quarry to ensure that runoff generated in the western part of the quarry continues to infiltrate close to the location where it currently does. Only when the quarry has been excavated to a depth where the two infiltration areas can be merged (i.e. as shown on the 75 Year plan) would the buttress be removed.
- Notwithstanding the incorporation in the quarry design of the infiltration areas discussed above, there will still be a diversion of recharge. However, it is worth noting that:
 - the total volume of recharge to the saturated zone of the aquifer as a whole is unlikely to change significantly and in fact may increase slightly (opportunity for evapotranspirative losses from grassed soil are probably greater than for water infiltrating through the east-west infiltration area and south-eastern pond),
 - the recharge is being redistributed but is entering the saturated zone broadly along the same flow path to the Taf Fechan springs (it is recharging closer to the springs for the quarried condition).
- NRW might suggest that the resulting recharge redistribution could introduce water into a different fracture system that did not feed the Taf Fechan springs. None of the evidence indicates that this is the case or that introducing more recharge closer to the Taf Fechan springs will result in water being diverted from them.
- The springs seem to be functioning perfectly well with the existing quarry in place (this will have been diverting some recharge to the south-eastern pond since it was excavated), so the only impact of future above water table working will be the diversion of some of the recharge in those areas to be quarried outside of the existing quarry. Whilst not insignificant, in the context of the groundwater catchment of the aquifer as whole, the area affected is relatively small and the impact on the flows within the saturated zone would likewise be small. Upgradient of the east-west infiltration area and southeastern pond there may be a reduction in recharge (with a reduction in flow in the saturated zone of the same magnitude), downgradient of these areas

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the flows will return to those of the pre-development condition (possibly slightly increased). The upgradient changes are not likely to be large enough to significantly impact NG01 and NG02.

- Working above the water table means that, in contrast to below water table working, no groundwater in the saturated zone will be diverted into the void. Groundwater in the saturated zone will continue to flow to wherever it used to flow to (e.g. Taf Fechan springs). It is only the diversion of some of the recharge in the expanded quarry footprint that could have an impact. Taking this and the points above into account means that, with the exception of springs NG01 and NG02, the risk to the various receptors associated with above water table working is considered to be Negligible. Some diversion of recharge out of the catchments for NG01 and NG02 cannot be ruled out, but it is considered that the magnitude of effect would not be more than Low, resulting in an impact that was Minor and therefore Not Significant.

Yours sincerely,

Stantec UK Limited



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