28 March 2022

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Jessie Evans
Director
Resource Assessments
Department of Planning and Environment
GPO Box 39
Parramatta NSW 2124

Dear Jessie,

RE: Bulli Seam Operations Project (MP 08_0150)
Appin Mine– Longwalls 709 to 711 and 905 Extraction Plan – request for additional information

I refer to your letter dated 7 March 2022, regarding the assessment of the Extraction Plan (EP) for Appin Mine's LWs 709-711 and LW 905 and the advice received from the Biodiversity Conservation Division (BCD) within the Department.

In response to the request for additional information, please see the below response table, which addresses the Department's requests. This document will also be uploaded to the Major Projects Portal.

Yours sincerely

Gary Brassington
Approvals Manager
South32 Ilawarra Metallurgical Coal

#	DPE Comment	IMC Response
1	**Groundwater Modelling and Peer Review** It is noted that the numerical groundwater model has been re-calibrated using additional monitoring data since the EP was submitted in October 2021. The Department seeks advice as to whether the groundwater model has been peer-reviewed, as per the NSW Aquifer Interference Policy. If not completed or currently underway, please provide a commitment for this to be undertaken.	IMC will engage a specialist to peer-review the groundwater model and assessment, as per the NSW Aquifer Interference Policy.
2	**Ditton-Merrick Model versus Tammetta Model for Height of Continuous Fracturing Predictions** The Department notes IMC's previous justification for use of the Ditton-Merrick model versus the Tammetta model for calculating the Height of Continuous Fracturing (HoCF). It also notes the Independent Expert Panel for Mining in the Catchment Report's recommendation of deferring to the Tammetta equations until such time further investigations are completed (IEPMC, 2019). In this circumstance, the Department considers that there would be value in providing a comparison of the HoCF equation calculations and a qualitative assessment of the potential surface impacts.	IMC will have the Groundwater Impact Assessment updated to include a comparison of the Tammetta and Ditton HoCF calculations, including a qualitative assessment of potential surface impacts.
3	**Groundwater Assessment** BCD considers that the Groundwater Assessment appears to rely on bore data from areas adjacent to the longwalls rather than in areas were maximum subsidence and impacts are likely to occur. The Department requires justification for the selection and exclusion of bores used to calibrate the groundwater model.	Monitoring boreholes above longwalls are required to be decommissioned with piezometers removed and capping prior to the extraction of longwalls for safety reasons. Unlike Dendrobium, these boreholes have not been routinely re-drilled and instrumented for post-extraction monitoring, hence their exclusion from the groundwater model. IMC will discuss the need for installing pre and post extraction monitoring with the specialist groundwater modeller and independent expert reviewer and implement on an as needs basis.
4	**Groundwater Monitoring** The Department notes that there is only one alluvial monitoring bore near the third order section of Navigation Creek proposed in the monitoring program. The	Pending landholder access agreement, IMC will install additional alluvial monitoring boreholes in third order sections of Foot Onslow Creek and Navigation Creek Tributary 1; one for each watercourse.

	Department requests that IMC consider expanding the existing monitoring program to include alluvial monitoring bores in third order sections of Navigation Creek, Navigation Creek Tributary 1 and Foot Onslow Creek that will be directly undermined and ensure that at least 12 months of data have been collected prior to extraction, wherever possible. Consideration should also be given to inclusion of piezometers over the longwalls.	Where access is granted, IMC will install pre and post extraction groundwater monitoring for the listed streams over the longwalls within the Hawkesbury Sandstone.
5	**Surface Water Monitoring** The surface water monitoring sites shown in Figure 8 of SLR (2021) and Figure 4 of SLR (2022) do not include any flow monitoring in watercourses or water level monitoring in pools over the proposed longwalls or at the existing NAV1, FO1 and HC10 water quality monitoring sites. The Department requests IMC update the existing monitoring program, or provide justification otherwise, for additional monitoring of flows and standing water levels in watercourses above and adjacent to the proposed longwalls.	Geomorphically, Navigation Creek, Foot Onslow Creek and Harris Creek are suitably characterised as an ephemeral chain-of-ponds system, particularly in the catchment where the proposed longwalls are located. Where these creek systems are located on private property, they are dominated by farm dams. Any surface water monitoring of these creeks, above the proposed longwalls, would essentially be reduced to monitoring the water levels of farm dams. IMC does not consider this to be a suitable monitoring strategy, given that landholders tend to use these dams (i.e. extract water). Monitoring sites above the proposed longwalls within sections of Navigation Creek and Foot Onslow Creek, on public property, were investigated during the development of the Extraction Plan application. Sites NAV2 and NAV3 (Figure 1), were investigated; no suitable sites for pool water level or flow monitoring were found. The existing site HC10 has suitable conditions for the installation of a water level benchmark and this will be installed.

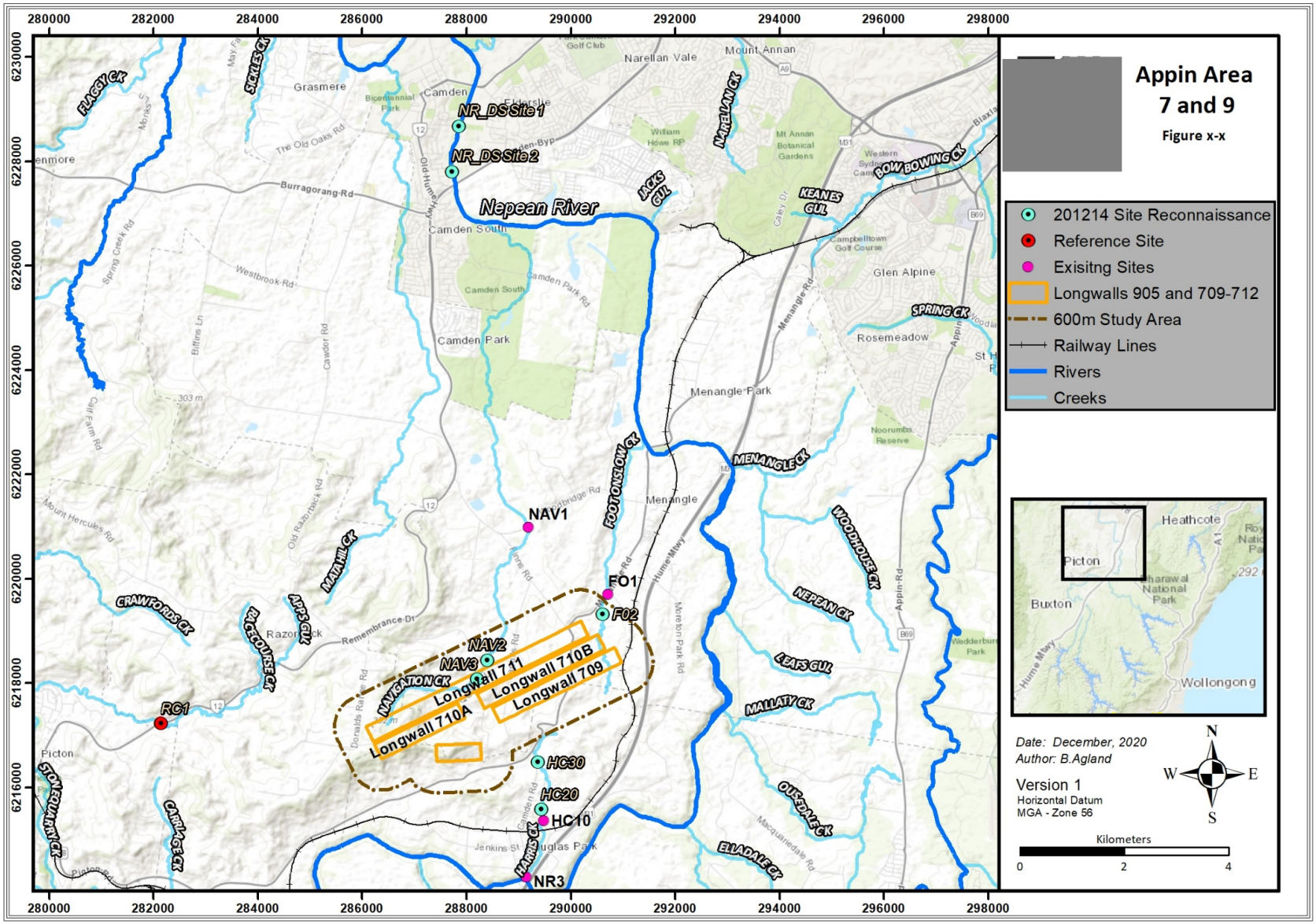

Figure 1 Surface water monitoring reconnaissance for the proposed longwalls.