

Our reference: DOC10/56350
Contact: Jennifer Sage, 9995 6856

Mr Kane Winwood
Senior Planner
Mining and Industry Project
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Dear Mr Winwood,

Penrith Lakes Scheme - Wildlife Lake weir and pipeline modifications

I refer to your letter dated 8 December 2010 regarding an application made by the Penrith Lakes Development Corporation (PLDC) to modify the current development approval for the Penrith Lakes Scheme (DA 4).

The current development approval for the Penrith Lakes Scheme provides for a flood outlet pipe from the Wildlife Lake to the Nepean River, discharging from the south-west portion of the lake, and a weir connecting the Wildlife Lake to the Nepean River. PLDC have submitted two separate applications to modify the location of the pipe to the north-west portion of the lake, discharging through a single 1350mm diameter pipe, approximately 130m long; and to construct a flood weir connecting the Wildlife Lake to Hunts Gully, instead of the Nepean River.

DECCW has reviewed the environmental assessment (EA) and associated documentation for the proposed modification to the pipeline and considers the key issues of the proposal to be –

- Aboriginal cultural heritage
- Flooding
- Water quality
- Erosion and sediment control

Other issues include threatened species, air quality and noise emissions.

These have been further detailed in Attachment A.

I understand that the New South Wales Office of Water (NOW) has provided comments separately to DECCW on issues relating to the *Water Management Act 2000*.

The Department of Environment and Climate Change NSW is now known as the Department of Environment, Climate Change and Water

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Environment protection licensing


PLDC has stated in its EA that an Environment Protection Licence is not required for the proposed modification to the pipeline and weir infrastructure, as it is not a scheduled activity. However, an EPL may be required for any operational discharges to waters through the proposed pipe during the construction phase of the proposed infrastructure. Such a licence would be required for the purpose of regulating discharges to the Nepean River, in accordance with s43d of the *Protection of the Environment Operations Act 1997* (POEO Act). Refer to Part 5.3 – Water Pollution in the POEO Act.

A water pollution licence is required in situations where the discharge to waters will result in pollution of waters. Schedule 5 of the Protection of the Environment Operations (General) Regulation 2009 defines pollution of waters including, among other things, the placing of various matters in waters.

I understand that PLDC has already submitted a licence variation application for its EPL (number 2956) for such discharges through our Sydney Industry section. DECCW is processing this application separately to the development approval modification application.

Should you wish to discuss any of the issues raised in this letter, please contact me on 9995 6856.

Yours sincerely,

 14.1.2011

JENNIFER SAGE
Acting Unit Head Metropolitan Infrastructure (Water)
Environment Protection and Regulation

Attachment A Penrith Lakes Scheme - Wildlife Lake weir and pipeline modifications

KEY ISSUES

Aboriginal cultural heritage

Weir and pipeline construction

It would appear that no archaeological or cultural heritage assessment has been conducted in part of the area proposed to be impacted by the proposed works which was set aside as a Conservation Zone and excluded from sand and gravel mining. There is an assumption in the EA that such assessment will be conducted under the existing Aboriginal Heritage Impact Permit (AHIP) #2595 and that a request to vary the permit is currently being considered by DECCW. This is incorrect as no such application has been received.

The AHIP, issued specifically for the purpose of undertaking sand and gravel mining, permitted impact to Aboriginal objects and salvage excavation of specified Aboriginal objects identified in the permit. At the time of issue of the AHIP (21 December 2006), the land contained within the Conservation Zone was specifically excluded from the AHIP.

While the AHIP was recently varied (27 October 2010), it was granted in exceptional circumstances to permit emergency works required to stabilise the farmhouse at Hadley Park and related solely to fill material removed during that process and did not permit further salvage excavation.

DECCW will not grant a further variation of the AHIP to enable impacts within the Conservation Zone. Rather, it will be necessary for the proponent to apply for an AHIP for the area within the Conservation Zone. The application will have to satisfy all requirements as outlined in the application and will need to comply with all the requirements of the *Aboriginal cultural heritage consultation requirements for proponents 2010*.

The EA should provide both an archaeological assessment and a cultural heritage assessment of the land subject to EA as well as evidence of consultation with Aboriginal stakeholders. The assessment should include disturbance mapping and information on previous archaeological assessments to justify the conclusions drawn in the EA.

Proposed Mitigation Measures

The EA contains no information on proposed mitigation and management measures but rather refers to AHIP #2595 and the PLDC heritage conservation plans. The proposed mitigation and management measures should be fully described by the proponent in the EA.

Flooding

The application for the proposed pipeline and weir contains detailed reports on the entire scheme rather than just the proposed infrastructure. Accordingly, the following general information is provided which in some instances relates to past discussions and meetings with PLDC and their consultants:

- Hydraulic modelling of the proposed weir and pipe system by Cardno for a range of flood events and rates of rise indicates that the system will function satisfactorily during flooding. In addition, it is understood that the flooding in adjacent areas such as Cranebrook is significantly controlled by the river weir next to the Quarantine Lake (i.e. Weir 1) and the weir/pipe between the Main Lake and the Wildlife Lake (i.e. Weir 6) and not the subject Wildlife Lake weir and pipe works. Accordingly, the subject weir and pipe system are considered to be independent of rest of the Penrith Lakes Scheme.

- The hydraulic modelling peer review by WMAwater for PLDC of work undertaken by Cardno provides a number of recommendations, which include undertaking sensitivity testing to assess the robustness of the proposed weir and outlet pipe design. DECCW supports the peer review recommendations. It is understood that Cardno have addressed those recommendations which directly relate to the weir and outlet pipe design.
- Although the overall flood reduction benefits of the Penrith Lakes Scheme are significant in a 100 year event there are also adverse flood impacts to the Cranebrook village area in a 200 year flood (for the currently assumed inter-lake design), which may need to be mitigated or compensated for in some way such as, by increasing the flow passing from the eastern lakes to the main lake(s).
- DECCW understands that there is little difference in off-site and on-site flooding impacts between the one or two lake scenarios for the small to large flood event range. However, the two lake system would involve more weir works and therefore potentially greater ongoing maintenance costs.
- Any proposal to include residential development in the scheme would need to carefully consider the required regional and local flood evacuation strategy, including use of local probable maximum flood (PMF) refuge sites to provide vital redundancy in the case of delayed response to evacuation warnings. The proposal should also include flood aware/smart development controls in order to reduce the significant risks of property damage (including total structural failure) to socially acceptable/manageable levels to future owners and occupants.

Outlet Pipe

The Concept Flood Drainage Design report states that the two proposed 1050mm diameter pipes “would most likely need to be steel to allow the pipes to be bolted together so that they could withstand the hydraulic pressure. Common concrete pipe jointing techniques are not considered suitable (page 18)”. However, Cardno’s application letter dated 29 November 2010 to Department of Planning list the outlet pipe as one 1350mm diameter pipe and the drawings described that one pipe as a reinforced concrete pressure pipe (Drawing W4826-017).

DECCW notes that the report states that “without energy dissipation there is the potential for a scour hole to form at the Wildlife Lake in the order of 23 – 35 metres in length” and recommends physical model testing of the energy dissipater structure, if the proposed dissipater design has not previously been thoroughly tested for the full range of potential flows. Nevertheless, consideration should be given to the use of more or larger pipes to reduce the pressure and scour levels. In this regard, peak flow velocities within the pipeline should be kept within acceptable limits and appropriate attention should be given to ensuring that the pipeline(s) is adequately anchored.

The outlet pipe is to be constructed in a section of the Nepean River which Cardno’s modelling predicts to be subject to high peak flood velocities (Figure 7.11 combined figures W4756). Accordingly, it is expected that the anchoring and protection of the outlet structure would also need to consider the impacts of river flood scour. Suitable geotechnical information, including rock levels, would need to be available to ensure that the anchoring and protection design is appropriate.

Weir structure

It is understood that PLDC / Cardno has provided information on properties downstream of the Wildlife Lake Weir, including the results of a preliminary dam break analysis, to the Dam Safety Committee to enable the Committee to determine whether the weir will be a prescribed structure under the *Dam Safety Act 1978*. Prescribed structures need to meet certain safety requirements.

In addition, it is noted that the report identifies that further detailed analysis and design is required. In this regard, consideration should be given to the possible use of physical modelling to help ensure the adequacy of the future detail design of the weir structure(s).

Page 18 of the Wildlife Lake Weir Concept Design report (Appendix B of Penrith Lakes Scheme Flood Infrastructure Concept Design report) states “any increases [in water level] will serve to further increase the impacts on the properties north of Smith Street, north east of the site. The impacts on the properties in this area are in the order of 0.18 metres, and therefore any increase will only further exacerbate this issue”.

Accordingly, the extent of the impacts on properties north of Smith Street may need to be clarified. The consent authority will need to determine the acceptability of the 0.18m increase to the flood level in a 200yr ARI flood (and about 0.3m increase in the flood level for a 100yr ARI flood), noting that the affected land is rural (horse stud property) rather than residential.

Water quality

DECCW considers that the proposed changes to the approved development will have minimal impacts on water quality in the Nepean River.

The concept is for the system to operate only at flows above the (current) 10yr ARI when the Nepean would flow via the proposed Hunts Creek weir to the (proposed) Wildlife Lake and subsequently drain back to the river via pipelines. At higher floods other flow paths would establish.

While no data is presented in the EA, DECCW considers that the proposed diversion of Hunts Creek through the (proposed) lakes rather than directly to the river is of small consequence.

Careful consideration will be given by DECCW to the requirements to be considered for discharges during the quarrying phase of the development in the proponent's Environment Protection Licence (EPL).

Issues to be addressed in the EPL are likely to be thermal pollution, sediments in the Lakes which could include organic carbon and other pollutants from the Lakes' catchment; and algal blooms and toxins which are likely to develop, as listed below.

Thermal pollution

Any water discharged from Wildlife Lake to the Nepean River during the construction phase should be within 2 degrees Celsius of the temperature of the receiving water. Such a limit will be placed in any EPL issued by DECCW for the Penrith Lakes Scheme.

Blue green algae

DECCW is aware that blooms of blue green algae regularly occur in the Penrith Lakes Scheme. To minimise impacts on the Nepean River from blue green algae (and potential toxins such as microcystin), PLDC should develop and implement a water quality management plan to monitor and manage the density of algae, including blue green algal species. This plan should include a monitoring program and appropriate treatment of water (including non-chemical treatment technology such as the use of activated carbon) should an algal bloom occur.

During the construction phase of the Penrith Lakes Scheme, discharge from the Wildlife Lake to the Nepean River should not occur when a blue green algal bloom is present. Such discharges will be regulated by DECCW through the EPL for the Penrith Lakes Scheme.

Total suspended solids

Any sediment load in the Wildlife Lake, generated from extractive or rehabilitation activities, should be allowed to settle in the lake prior to discharging water to the Nepean River. Limits will be placed on the total suspended solids concentration for discharges to water from the premises.

Thermal stratification

The water in the Wildlife Lake may stratify at certain times of the year. Should this occur, the water at depth may have lower pH and dissolved oxygen levels and potentially contain elevated levels of metals and nutrients (nitrogen and phosphorus). Under these conditions, the water discharged from the Wildlife Lake should be taken from the water surface above the thermocline, to avoid water of lower quality.

Other potential pollutants

Conditions surrounding discharge limits and monitoring requirements for other potential pollutants in water discharged from the Wildlife Lake during construction of the proposed infrastructure (including nutrients; metals; and organic matter) will be developed separately by DECCW through the licence variation process.

Erosion and sediment control

The EA estimates that an area of riparian vegetation approximately 500m² will be cleared to allow for construction of the pipe outlet structure. The area of vegetation to be cleared for the flood weir at Hunts Gully has not been quantified in the EA. The clearing of vegetation for these two pieces of infrastructure represent a source of sediment that can be conveyed via surface water flows and wind to nearby waters.

To minimise erosion and to control sediments the proponent should submit an Erosion and Sediment Control Plan for the proposed works, which includes appropriate erosion and sediment control measures for cleared sites and stockpiled material. These should include the separation of clean and sediment laden run-off, installation of silt fences, silt curtains in the Nepean River during construction of the dissipater structure for the pipeline, sediment ponds and bunding, as appropriate.

OTHER ISSUES

Threatened species

DECCW understands that the proposal will lead to the removal or modification of a small area of degraded remnant vegetation.

Sections 5.1.5 of the EA for the Wildlife Lake Weir and the Pipeline propose a number of mitigation measures that should be applied, and DECCW supports the implementation of these measures through any modified conditions of approval.

Air quality during construction

Dust emissions may be produced as a result of earthworks required to construct the proposed pipeline and weir. Mitigation measures must be implemented to reduce the emission of dust from the premises.

An air quality management plan should be developed for the proposed works to describe proposed mitigation measures and safeguards to control dust generation and to minimise impacts on nearby receptors.

The existing DA requires dust monitoring to be carried out on the premises in accordance with the EPA licence conditions and reporting of air quality monitoring to be submitted to DECCW on a quarterly basis. Conditions for the management of dust emissions are also in place in the Environment Protection Licence for the premises.

DECCW considers the existing conditions are applicable to the proposed works.

Noise

The works for the proposed infrastructure will result in emission of noise and vibration, through heavy plant and equipment and installation of the pipe and dissipation structures. Existing noise emissions are also currently generated from quarrying activities carried out on the site.

DECCW considers that the proponent should design and construct the infrastructure such that there is no increase in noise levels over those currently being emitted from the premises, when assessed at the most affected sensitive receiver location.

Noise limits in the existing DA are consistent with noise limits in the current EPL for the Penrith Lakes scheme. DECCW considers that these noise limits would be applicable for the construction of the proposed works.

The construction hours for the proposed works should be limited to the construction hours currently approved for the quarrying activities at the site.

