

From: [Mike and Heather McLeod](#)
To: [IPCN Enquiries Mailbox](#)
Subject: I object to the Dendrobium Extension Project SSD 8194
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I object to the Dendrobium Extension Project (SSD 8194)

Mining induced subsidence will damage the watercourses and swamps that feed our drinking water reservoirs

South 32 predicts that its 305 metre wide long wall panels may result in subsidence of 2m to 2.45m[4]. Previous mines of similar width have caused 2.5m to 3 m of subsidence, so South 32's prediction may be conservative[5]. The mining and associated subsidence will also cause cracking of the land on the surface – including rivers, creeks, smaller watercourses and swamps that feed our drinking water reservoirs – and subsequent water loss to the catchment. No level of damage is acceptable to the Special Areas. The mining will come to within 300m of the Avon and Cordeaux Reservoirs. It will result in water losses from Avon, which is the only source of water supply to over 310,000 residents and businesses in the Illawarra region[6], as well as Cordeaux Reservoir, which along with Cataract Reservoir is the main water supply for Camden, Campbelltown and Wollondilly council areas and even as far afield as Nepean Reservoir, which is the water supply for the nearby towns of Bargo, Thirlmere, Picton and The Oaks. All three affected reservoirs, Avon, Cordeaux and Nepean also supply water to Sydney. As an important component of the Greater Sydney Water Catchment, these reservoirs supply between 20 and 30% of Greater Sydney's water in normal times, and in times when Warragamba is compromised by water quality (for example the 1998 cryptosporidium and giardia water crisis, or the 2019/20 black summer bushfires which burned the Warragamba catchment) they may supply even more. In dry years, the watercourses in the mined area that flow into Avon Reservoir are expected to totally dry up.

Millions of litres of water will be lost

The cracking and dewatering of watercourses, swamps and aquifers is expected to add the loss of many more millions of litres of water each day to the 10 million litres daily water loss from Dendrobium's current and past mining. Dendrobium's average daily water loss for the duration of the expansion project will be 22 million litres (ML). Water loss will peak around 2032 to 2036 at 26ML per day.[7] This is equivalent to the daily water usage of 130,000 people![8].

The existing water discharge into Allans Creek, Unanderra will double. This is the same discharge point that was recently identified as exceeding safe levels of heavy metals.[9] South32 wants to purchase water licenses and pay cash compensation to WaterNSW for the water they take from the catchment. This cannot possibly compensate for irreversible damage to the Special Areas and for the legacy of water loss. The water loss has been modelled for the 171 years from 2048 to 2319.[10]

Government agencies outside Planning are concerned

The NSW Government's Independent Advisory Panel for Underground Mining has said, "It is not possible, at this stage, to be comfortable that the worst-case losses from the surface water regime have been identified. Stream depletion can arise from combinations of reductions in overland and groundwater flow to the streams and increases in stream losses to the groundwater."[11]

Water NSW has also questioned the reliability of the modelling stating, "that previous iterations of the model had predicted surface water take at the existing Dendrobium Mine and that these predictions had increased 5-fold in the 5 years since 2014 (now 1372 ML/year)".[12]

WaterNSW has been clear that mining in the Special Areas causes loss of yield to the

reservoirs and the swamps and water courses that charge them.[13]

Damage to WaterNSW infrastructure

The mining expansion risks damage to critical WaterNSW infrastructure, including the dam walls of Avon and Cordeaux Reservoirs, the Lower Cordeaux Dam Project and WaterNSW's Deep Water Access Project. It is even expected to cause ground movement at the dam walls.

WaterNSW's Deep Water Access Project aims to provide water security for the Illawarra by constructing a deep water pumping system to access the reservoir's deeper waters.[14] Avon Dam is the only source of water supply to over 310,000 residents and businesses in the Illawarra region[15] and yet, WaterNSW says that the Dendrobium Extension Project could affect its ability to construct and operate this important infrastructure project[16]. The mining is also too close to the dam walls. WaterNSW stated that the 1000m setback from the dam walls is not enough and the setback should be at least 1500m, adding that, "Should any impacts occur to these dams, there is the potential that the risks and consequences could be extreme." [17]

Water quality

As water courses fracture due to mining induced subsidence, metals will be dissolved and leach into the water. This will lead to an increase in metals in the water courses and reservoirs. Furthermore, this increase will worsen in the 100 – 200 year period of groundwater recovery.[18]

WaterNSW in particular expressed concern about the levels of metal contamination, stating,

"WaterNSW is concerned that any increase in arsenic (or other heavy metals) may have a negative effect on water quality and aquatic ecology." [19]

Damage to Upland Swamps

The upland swamps of the Woronora Plateau play an important role in the water catchment by capturing and holding water, filtering it and in times of drought releasing it slowly into the creeks and rivers that feed into the reservoirs. These swamps are also classified as Endangered Ecological Communities (EEC) and are significant in terms of their biodiversity.

The upland swamps provide a mosaic of permanently wet peaty soil within a dry sandstone landscape. Each swamp is a unique island community containing rare plants and animals. The specialised flora and fauna of the EEC also carry individual protection at species level. Dewatering the swamps will result in local extinctions in breach of multiple layers of State and Federal legislative protection.

There are 46 swamps in the mining area and 25 of these are expected to be cracked by the mining. Water drains away from swamps into the mining void, the swamps dessicate, the flora and fauna die off, and dryland species take over. The swamps lose their capacity to hold water in drier times. They are more prone to erosion and more prone to bushfire. Research shows that swamps that have been undermined are less able to recover after bushfire compared to swamps that were not undermined.[20]

Coastal upland swamps also provide carbon capture and storage ecoservices. [21] Neither South32 or DPIE have considered or estimated greenhouse gas emissions associated with expected swamp destruction, or loss of carbon uptake that the swamps currently perform.

Bushfire risk

Dewatering of the forest, bushland and swamps above the mining will make the area more prone to bushfire. The water catchment was one of the few unburnt areas of bushland in the 2020 fires and it needs to be protected from mining induced degradation. It is also close to the highly populated residential areas of Wollongong that are located along the Illawarra Escarpment; making the catchment more fire prone makes the

escarpment more fire prone.

A legacy of water loss and contamination for future generations

It will take 100 years for groundwater levels to stabilise in Area 5 and 200 years for Area 6.[22] Thus the drawdown/dewatering impacts of the mining will remain long after we are gone. This is a problem that we will hand down to future generations, descendants that will be more challenged by climate change, subject to more extreme weather events, longer and more severe droughts and more serious bushfire risk.

The NSW Independent Advisory Panel for Underground Mining says that,

“At this stage, because there is a lack of clarity as to if and how Dendrobium Mine can be sealed, it should be assumed that surface losses from the catchment will occur over the long term and potentially in perpetuity.” [23]

The discharge water from the mining will also need to be managed and treated, perhaps in perpetuity, and this is another burden that we leave for future generations. Previous mining at Dendrobium has already burdened future generations with a legacy of water loss and contamination and this expansion will make it much worse.

NSW Government locking in 28 years of destructive coal mining is irresponsible economic planning

We need to rapidly reduce greenhouse gas emissions to address global warming. One of the obvious - and appropriately ambitious, given the climate emergency - ways to decarbonise industry is to start with steel.[24] Port Kembla has been identified as having good prospects for moving from existing fossil fuel-based steel-making to making low-emissions steel. This transition would not only retain jobs in the Illawarra, it would position Australia well in the emerging low-carbon future.

No alternative is provided to this shockingly destructive expansion which will cause permanent damage to our water catchment

There should be no mining in the Special Areas of Greater Sydney Water Catchment; this is the stated position of WaterNSW and the legislated purpose of Special Area protection.

It is outrageous that DPIE not only support this destructive mining expansion, but the Department also required no alternative mine design options to reduce the damage should an expansion proceed. Having failed to explore any alternatives, the DPIE is claiming without evidence that narrower longwalls would still cause significant damage and “would come at an unsustainable economic cost” for the mining company.[25]

The NSW government requires South32 to consider alternatives, including mining in domains for which they have existing approvals and modifying the design to “avoid key sensitive surface features, including swamps and water storage infrastructure”.[26]

South32 have failed to address these imperatives and yet the Department has supported the proposal rather than uphold standards of responsible planning.

In conclusion, this expansion project is not in the public interest and it should be rejected.

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- [6] WaterNSW Fact Sheet – Illawarra Water Security Project, November 2019, accessed 9.11.20 at: https://www.waternsw.com.au/_data/assets/pdf_file/0007/150757/Avon-Deep-Water-Access-Fact-Sheet-Nov-2019.pdf
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