Why I Strongly Object to the Proposed Wambo Mine Expansion

Anthropogenic climate change is real and poses serious risks for the wellbeing of humans and our societies. These risks rise rapidly and nonlinearly with the rise in global average surface temperature. 2. Recognising that the risks to human wellbeing of unchecked climate change are too high to accept, governments around the world have agreed to limit warming to 1.5-2.0°C (the 2015 Paris accord). 3. The carbon budget approach is the most robust way to determine the rate of emissions reductions required to meet the goals of the Paris accord. This approach limits the cumulative amount of additional CO2 emissions that can be allowed consistent with the Paris accord. 4. To meet a 2°C carbon budget, a very rapid phase-out of all fossil fuel usage by 2050 at the latest, or preferably earlier, is required. The 1.5°C carbon budget is smaller, requiring an even more rapid phase-out of fossil fuel usage. 5. This means that the majority of the world's existing fossil fuel reserves must be left in the ground, unburned. Furthermore, no new fossil fuel developments, or extensions to existing fossil fuel mines or wells, can be allowed.

The rate of climate change is alarming. The rise in atmospheric CO2 concentration is up to 10 times faster than the most rapid changes in the geological record (Lüthi et al. 2008). Since 1970 global average surface temperature has been rising at a rate of 1.7°C per century, compared to a 7,000-year background rate of change of about 0.01°C per century (NOAA 2016; Marcott et al. 2013). 14. Many other features of the climate system, in addition to global average surface temperature, are changing as a result of anthropogenic greenhouse gas emissions (IPCC 2013). These include changes in the basic circulation patterns of the atmosphere and the ocean, increasing intensity and frequency of many extreme weather events, increasing acidity of the oceans, rising sea levels and consequent increases in coastal flooding, and intensification of the hydrological cycle. 15. The impacts of climate change are already being felt around the world. As reported by the IPCC (2013), the most authoritative assessment body on the science of climate change, some of the most important impacts are: a) Warmer and/or fewer cold days and nights over most land areas. b) Warmer and/or more frequent hot days and nights over most land areas. c) Increases in the frequency and/or duration of heat waves in many regions. d) Increase in the frequency, intensity and/or amount of heavy precipitation (more land areas with increases than with decreases). e) Increases in intensity and/or duration of drought in many regions since 1970. f) Increases in intense tropical cyclone activity in the North Atlantic since 1970. g) Increased incidence and/or magnitude of extreme high sea levels. 16. The impacts of climate change are also being felt in many ways across Australia, especially in the form of changes in extreme weather events (CSIRO and BoM 2015). 17. The evidence for the influence of climate change on worsening extreme weather include: a) The fact that all extreme weather events are now occurring in an atmosphere that is warmer and wetter than it was 70 years ago (Trenberth 2012); b) Long-term data records show observed changes in the nature of extreme weather; and 4 c) Climate models run with and without the additional greenhouse gases in the atmosphere from human emissions show the increase in likelihood that a specific extreme weather event would have occurred because of climate change. 18. The most important of these climate-related impacts are (CSIRO and BoM 2015): a) Australia's average surface temperature has increased by 0.9°C from 1910 to 2014 (and now to over 1.0°C). b) Many heat-related records were broken in the summer of 2012-2013, and again in the two most recent summers. 2013 was Australia's hottest year on record. c) Heat waves have increased in duration, frequency and intensity in many parts of the country. d) Cool-season rainfall has declined in southeast and southwest Australia and wet-season rainfall has increased in northern Australia. e) Heavy daily rainfall has accounted for an increased proportion of total annual rainfall over an increasing fraction of the Australian continent since the 1970s. f) Extreme fire weather days have increased at 24 out of 38

monitoring sites from 1973- 2010 due to warmer and drier conditions. g) For 1966-2009 the average rate of relative sea-level rise along the Australian coast was approximately 1.4 millimetres per year. 19. Southeast Australia has experienced many of the impacts that have been observed around Australia as a whole (CSIRO and BoM 2015). In particular, these include: a) Changes in heatwaves, such as more frequent occurrence, increasing number of heatwave days and the hottest day of a heatwave becoming even hotter. b) Increases in the Forest Fire Danger Index have occurred mostly in the southeast region of the continent. c) Strong drying trends in cool-season rainfall since 1990. d) Three-fold increase in coastal flooding in the Sydney region through the 20th century. 20. The NSW mid-north coast region and adjacent inland areas have also experienced many impacts of climate change. These include: 5 a)

The incidence of coastal flooding events has likely increased by approximately threefold through the 20th century, as observed in Sydney Harbour (the nearest observation station with long-term records) (Church et al. 2006). b) Heatwaves have worsened in the following ways: (i) the number of heatwave days is increasing; (ii) the first heatwave of the season is occurring earlier; and (iii) the hottest day of a heatwave is becoming hotter (Perkins and Alexander 2013). c) In terms of bushfire weather, there are no long-term monitoring stations in the NSW mid-north coast region, but further inland in central-west NSW there has been a significant increase in the McArthur Forest Fire Danger Index (FFDI) from 1973 to 2013 (CSIRO and BoM 2015). At Nowra on the NSW South Coast, there has also been an increase in the FFDI from 1973 to 2013, although of a smaller magnitude than for the central-west NSW station (Clarke et al. 2013). d) Observations show mixed changes in rainfall patterns for the region. For the northern wet season (October to April), rainfall has been above average for the 1997-2013 period. For the southern cool season (April to September), rainfall has been above average along the coast but below average in some inland areas (CSIRO and BoM 2015).

Sincerely,

Robert McLaughlin

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