

ATTACHMENT 3

Expert report: Dr Tanya Mason

Requesting agency: EDO / Protect Our Water Catchment

Date of request: 25th May 2022

Date of submission: 6th June 2022

Background: I am a vegetation ecologist and Research Fellow at UNSW. My CV is attached. I have worked extensively on upland swamps within Dharawal National Park, to the north of the proposed Dendrobium Extension Project area. I have also researched the effects of underground mining on swamp vegetation in the Avon and Cordeaux catchment areas. My research study sites include swamps above longwalls of Dendrobium Area 3B. I have also designed and conducted an *ex-situ* mesocosm experiment investigating hydrological and fire effects on swamp conservation.

As author of this expert report, I acknowledge that I have read and agree to comply with Part 31 Division 2 of the Uniform Civil Procedure Rules 2005 (NSW) and the Expert Witness Code of Conduct.

Summary:

I present primary research results and a review of literature to assert that an extension project of longwall mining in Area 5 would represent a significant impact on upland swamp ecology and function. Subsidence effects from underground mining are extensive, persistent and defy remediation or restoration effort. The Project would compound existing mining impacts with cumulative effects threatening conservation of the endangered swamp network on the Woronora Plateau. The endangered status and restricted distribution of upland swamp communities means that avoidance is the only mechanism of effective intergenerational stewardship and conservation.

Requested focus of expert opinion:

a. [In your opinion, is the redesigned Project likely to have a significant impact on upland swamp ecosystems? Please provide reasoning for your answer.](#)

Coastal Upland Swamps are climatically marginal ecosystems on uplands and plateaus of south eastern mainland Australia and Tasmania (Keith et al. 2014). Their restricted distribution means that **any diminution of extent and condition threatens their conservation**. Commonwealth Conservation Advice (including listing advice) (Department of the Environment 2014) for Coastal Upland Swamps in the Sydney Basin Bioregion states: “The landscape distribution of swamp ecosystems is a function of local climate, landform, substrate variables and sub-catchment features and activities which influence hydrological regimes. **Given the very specific set of variables required for the Coastal Upland Swamps to develop and persist, the areas currently occupied and the associated sub-catchment are considered to be areas critical to the survival of the community**” (p. 8).

The Project identifies 22 Coastal Upland Swamps within 600m of the proposed longwalls in Area 5 (IMC Section 7 – Environmental Assessment) and therefore potentially affected by mining subsidence. Sixteen of these swamps are within 60m of proposed longwalls and this swamp area is estimated at 8.6 ha (Appendix D, p. 360). We have demonstrated that subsidence disturbance has persistent and severe effects on overlaying swamp hydrology (Mason et al. 2021) and has long term effects on swamp condition metrics such as species richness, above ground biomass and species composition (Mason et al. in review). While the Project proposes a fundamental alteration to

hydrological drivers for at least 8.6 ha of swamp extent, it does not account for associated sub-catchments in the assessment. Furthermore, swamps up to ~600 m from footprint perimeters may experience dewatering (Watershed HydroGeo 2022) and as such a full inventory of affected swamp extents may not be captured in the Applicant's impact assessment. Ultimately, a reduction in any accounted and unaccounted swamp biodiversity and function reduces extent and condition and necessarily threatens Coastal Upland swamp conservation.

The Applicant's Biodiversity Report asserts:

"Whilst not predicted, if at an extreme scale, if [sic] all 8.6 ha of Coastal Upland Swamp were to be impacted and transition to non-EEC units, this would account for less than 1% of the known occurrence of Coastal Upland Swamps. As such, the remaining areas of Coastal Upland Swamp, much of which are already informally protected within WaterNSW landholdings, would still persist" (Appendix D, p. 363).

This statement is a clear example of **inappropriate accounting and inadequate recognition of cumulative detrimental effects on swamp conservation.**

There appears to be discord between the Biodiversity Report (Appendix D) and Aquatic Ecology Assessment (Appendix E) provided by the Applicant. While cumulative impacts are acknowledged in both documents, only the Aquatic Ecology Assessment quantifies this cumulative impact on Upland Swamp communities. Specifically, the Assessment asserts:

"Previous longwall and bord and pillar mines have impacted approximately 5 square kilometres (km²) or 35% of the total 14.3 km² of swamp habitat within the upper Avon and Cordeaux River catchments. Longwall mining in Areas 1, 2, 3A, 3B at the Dendrobium Mine resulted in increased rates of groundwater recession, reduced soil moisture, reductions in size and/or changes in the vegetation community in swamps. Following extraction of Longwalls 9 to 12 in Area 3B, each overlying swamp (at least those monitored: Swamps 1a, 1b, 3, 5, 8 and 10) experienced reductions in shallow groundwater. Reductions in soil moisture was observed in Swamps 5, 8 and 11 (BHP Billiton Illawarra Coal [BHPBIC] 2015, South32 2016b, 2017). Examination of shallow groundwater levels in swamps suggests reductions of up to 1 to 2 m in groundwater levels following longwall extraction. Water levels generally return to baseline levels following large rainfall events, but only for short periods of time (several days following the rainfall event)." (Appendix E, p. 31).

By the Applicant's own assessment, completed longwall mining represents a major and persistent threat to Coastal Upland swamp viability on the Woronora Plateau with cumulative disturbance to 35% of swamp habitat. **The proposal represents an extension of the existing mining footprint and the clumped configuration of impact (landscape contagion) would also extend.** The uniform landscape pattern of undermining may be expected to magnify swamp ecosystem function loss (water regulation).

It is essential that decision makers fully consider the cumulative impact of multiple longwall mining actions and the resultant capacity of Upland Swamps to maintain landscape representation. Focusing only on swamp area affected by the extension component of the Project and largely ignoring cumulative extant undermined swamp area is a clear example of **"death by a thousand cuts"** or the **"tyranny of small decisions"** (Raiter et al. 2014) where the cumulative effect on swamp fragmentation and function cannot be appropriately assessed.

b. The Applicant claims that the design of the Project (revised from the earlier refused SSD application) "includes avoidance of key surface features, which would reduce potential impacts to aquatic habitat [and] upland swamp" (e.g. "approximately 40% reduction in the number of swamps

(listed as threatened) longwall mined beneath”; “avoidance of the ‘Area 4’ swamp cluster”). In your opinion, are these justifiable and accurate statements?

Coastal Upland Swamps are listed as “endangered” ecological communities under both state and Commonwealth legislation. This Endangered determination indicates the conservation challenge facing swamp communities. Swamp disturbance following subsidence is a key threatening process as it disrupts hydrological resources – a fundamental driver of wetland conservation.

The Applicant emphasises that the Project “...includes the continuation of longwall mining at the approved Dendrobium Mine within a new underground mining area (Area 5)” (EIS Executive Summary, p. ES-1). In addition, the Aquatic Ecology Assessment (Appendix E) acknowledges that **35% of swamp habitat in the Avon and Cordeaux River catchments have been affected by mining**. The Assessment does not appear to formally analyse how the extension project will affect the strength of spatial contagion in the pattern of habitat destruction or hydrological modification (refer to Boakes et al. 2010 for a related analysis). Regardless of comparative reduction in the newly proposed mine footprint extension, the inventory of completed longwalls combined with the addition of new proposals will reduce the extent of Coastal Upland Swamp habitat. Obligate swamp species such as hydrophilous plant species and stygofauna dependent on perched upland swamp and shallow Hawkesbury sandstone aquifer habitat will be adversely affected. **Population dynamics may be irretrievably disrupted with local species extinction and loss of ecosystem function.**

c. Mining subsidence can have deleterious effects on local water resources. In your opinion, have the risks of subsidence been evaluated appropriately as to their potential to harm local water resources—quantity or quality?

Upland swamps within a catchment assist in regulating water quantity and quality, moderating sedimentation, attenuating stream flows and sustaining flows in dry periods. These ecosystem functions are threatened by subsidence and dewatering from longwall mining. We monitored the effect of longwall mining on soil moisture in the root zone of swamp communities using automatic hydrological stations over a five-year period (Mason et al. 2021). A qualitative comparison of hydrological signatures for Cyperoid heath in unmined and mined states showed that groundwater levels and vadose soil moisture responded to rainfall events more closely in the mined upland swamp than in the unmined upland swamp. The unmined upland swamp retained higher root zone soil moisture and elevated groundwater levels for long durations after a rainfall event. In contrast, the mined upland swamp exhibited short-lived spikes in both root zone soil moisture and groundwater levels, with the magnitude of spikes corresponding to the magnitude of contemporaneous rainfall events. **Our results comparing mined and unmined swamps clearly demonstrated the reduced water regulating ecosystem function of swamps after mining disturbance.**

When combined with extant longwall mining effects and their strengthening pattern of spatial habitat-loss contagion, further mining subsidence will reduce local water quantity. However, the assessment does not spatially contextualise the proposed extension within existing longwall disturbance. The Aquatic Ecology and Biodiversity Report Assessments indicate only minor or localised effect on water quantity in part because they predominantly address the proposed extension only. While the assessments acknowledge the potential for cumulative effects, they do not quantify the full mining disturbance on water quantity and quality.

d. In your opinion, is the impact of water use by the mine as envisaged in its extension fully considered in the environmental impact statement, as it applies to surface water and drainage?

I cannot provide expert opinion on the assumptions and limitations of submitted surface water and drainage modelling. However, as a general observation, I find it perplexing that the Surface Water Assessment (Appendix C) does not interrogate the modelling using known scouring and erosion events which have following subsidence disturbance at swamp locations of the Southern Coalfield. Evidence of mining-related surface water impacts has accumulated from anecdotes, logical argument and unstructured observations. A review noted observed scouring and erosion effects following subsidence at Drillhole Swamp, Swamp 18 and Swamp 19 (Advisian WorleyParsons Group 2016, Table 7.5, p. 159-160). How does the model perform using known subsidence, biotic and geomorphological parameters when applied to swamps where erosive impacts have been observed? Is the model validated by known subsidence-driven erosion events?

e. The Project proposal indicates that the Applicant will continue to conduct aquatic ecology monitoring under 'Mitigation Measures and Monitoring' (see IMC 2020). In your view is the monitoring sufficiently rigorous and robust to meet its aims, track deleterious environmental changes, and inform mitigation activities, if required?

Our peer-reviewed, scientifically rigorous research has indicated **major disruption of ecosystem function** due to persistent hydrological change following longwall mining (Mason et al. 2021). Mason et al. (2021) used monitoring sites which have also been used for monitoring by the Applicant (Swamp 1a, 1b and 5 of Area 3B). I therefore query how the Applicant could conclude "minor changes in the ecosystem functionality of the swamp" (IMC 2020) with such overlap in site selection. Compared with my research findings, the monitoring outcomes as reported in the Environmental Performance document (IMC 2020) are **misleading and insufficient**. I must therefore query the rigor and robustness of a program that does not seem to deliver credible monitoring findings.

Furthermore, the monitoring program does not actually appear to directly measure change in ecosystem function. Wetland formation and persistence are fundamentally driven by hydrologic conditions (Zedler and Kercher 2005). However, hydrological change, through soil moisture change or groundwater recession, is not assessed (IMC 2020). In contrast, our study (Mason et al. 2021) used dielectric soil moisture probes, shallow groundwater piezometers and rainfall gauges to monitor hydrological parameters and ecosystem function.

Our study contemporaneously monitored unmined and mined swamps across the Woronora Plateau. We addressed the necessary clustering of mined swamps by controlling for spatial covariables and upland swamps. In addition, our study followed hydrological change over 5 years and we used Accelerated Failure Time models to analyse soil moisture persistence (Mason et al. 2021). It is unclear whether monitoring by the Applicant (IMC 2020) follows similar rigorous experimental design.

The existing monitoring approach includes repeat mapping of swamp boundaries (IMC 2020). However, this approach **does not adequately account for temporal lags in vegetation response to hydrological change**. Our recent research (Mason et al. in review) has demonstrated that biomass and species richness metrics may lag in their effect following hydrological change. However, when compounded with fire disturbance or over time alone, community effects are significant and persistent. Monitoring document references offered by the Applicant in IMC (2020) are not up to date (latest reports are dated 2015) and generally coincide with end of panel extraction. Longwall mining impacts are lagged and persistent and therefore require ongoing monitoring (beyond three years) to identify effects. **It is misleading to surmise that effects are minor when monitoring is clearly truncated.**

f. Provide any further observations or opinions which you consider to be relevant.

The effects of **hydrological disturbance cannot be comprehensively assessed by planning bodies without also considering a landscape context of recurrent fire disturbance**. Wherever long-term hydrological disturbance of wetland ecosystems occurs, policymakers should expect persistent ecosystem function and biodiversity impacts. When overlaid with recurrent, endogenous disturbance such as fire, hydrological impacts may be magnified and community transformations may occur (Figure 1, reproduced from Mason et al. in review).

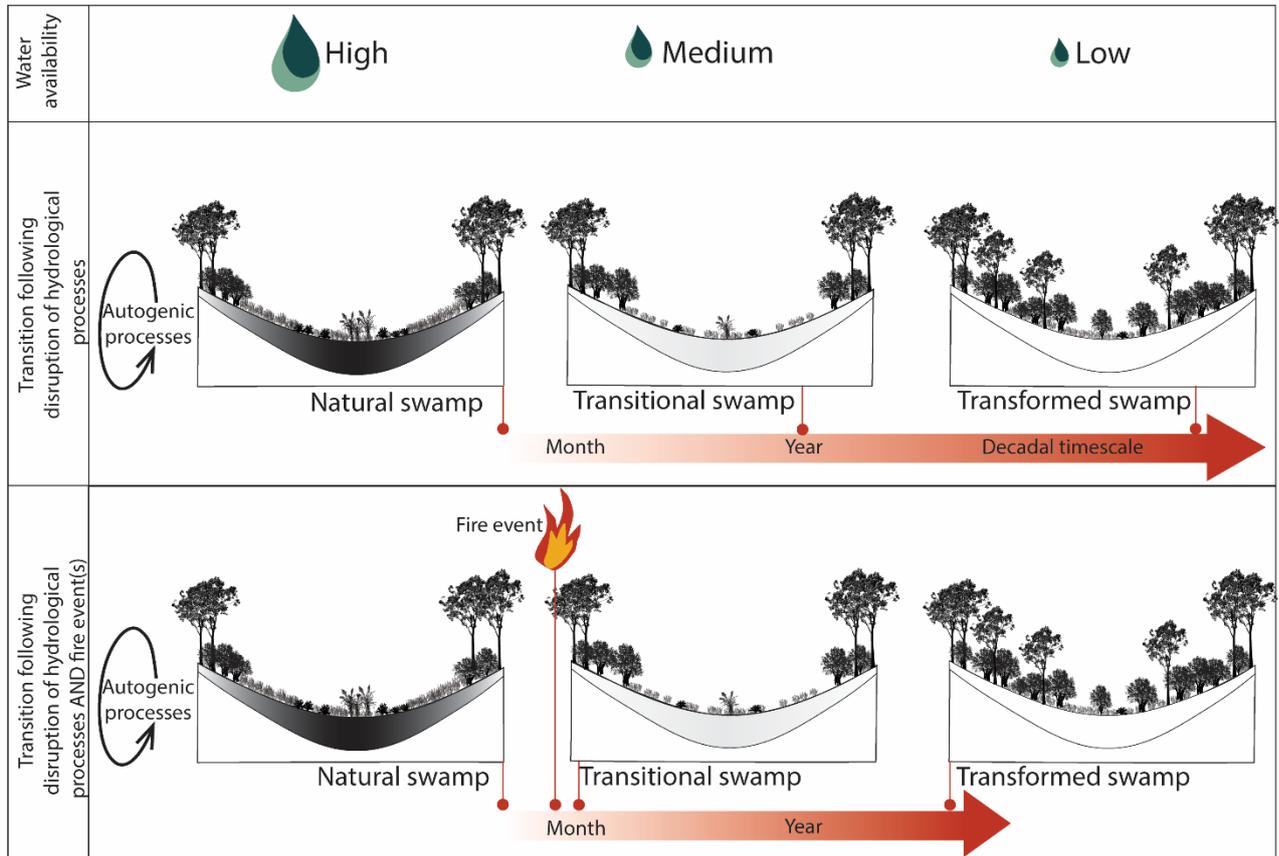


Figure 1: Conceptual model of swamp transition after changes to bottom up (underground longwall mining) and top-down (periodic fire) processes over decadal time periods. Note that wet to dry soil conditions are illustrated with black (wet) gradation to white (dry) for the idealised hydrological gradient in the Natural swamp. Vegetation properties may differ among transformed swamps experiencing hydrological disruption alone vs. hydrological and fire disturbance.

Mining disturbance may entrain unidirectional change where communities transition from wet to dry swamp and then onto terrestrial subcommunities.

The Biodiversity Report (Appendix D) for the project asserts:

“Whist IMC acknowledges that a groundwater change may be experienced in Coastal Upland Swamps in the Subject Land, there is strong evidence that indicates native vegetation and fauna habitat would still persist following mining. In fact there is little evidence to the contrary, and as such IMC propose that this be taken into consideration when determining the biodiversity offset liability associated with Coastal Upland” (p. 432).

The **BDAR statement erroneously interprets** the time lag in swamp productivity and biodiversity response to undermining as indicating “little evidence” of impact. In contrast, **statistically robust**

and peer-reviewed research indicates that longwall mining represents an **unambiguous hydrological disruption** with short and long-term physical change (Mason et al. 2021). It is intuitive that groundwater-dependent ecosystems such as swamps will experience **fundamental change to vegetation communities**. Concordantly, we have found lagged but strong evidence for biotic changes in above ground biomass and species richness during a 3.5 year swamp mesocosm glasshouse experiment (Mason et al. in review).

Furthermore, Keith et al. (2022) found that relative to burnt reference swamps on the Newnes Plateau, burnt and mined swamps showed greater loss of peat via substrate combustion, reduced cover, height and biomass of regenerating vegetation, reduced post-fire plant species richness and abundance, altered plant species composition, increased mortality rates of woody plants, reduced post-fire seedling recruitment, and local extinction of a hydrophilic fauna species. Fire is an endogenous and recurrent disturbance in the subject landscape. It is therefore incumbent on the Applicant and decisionmakers to consider the periodic occurrence of fire and its capacity to transform undermined swamp vegetation. Keith et al. (2022) concluded that mined swamps showed **strong symptoms of post-fire ecosystem collapse**. This is where lasting loss or displacement of biota occurs with reorganisation of structure and ecological processes. It is incorrect to assert minimal impact on swamp communities when **temporal lags, multiple disturbance (hydrological change and fire disturbance) and ecosystem collapse** have not been appropriately considered in the Biodiversity Report.

Upland swamps near (a buffer zone up to ~600m) the footprint of underground longwall mining may experience drying due to increased permeability of sandstone aquifers in the surface cracking zone (Watershed HydroGeo 2022). Within the lateral buffer zone, swamps that source water from a regional water table rather than relying on rainfall alone may also experience drying or partial drying (David et al. 2017). Our glasshouse swamp mesocosm experiment found that **even under partial dewatering, swamp species richness was disproportionately diminished by fire disturbance** (Mason et al. in review). Consequently, swamps within and near the longwall mine footprint may be vulnerable to transition when fire follows hydrological disturbance and mine-related subsidence impacts cannot be considered by decision makers to be confined to the absolute underground mining footprint. Swamp Den98 – which has been recognised as having “special significance” (IMC Section 7 Environmental Assessment, p. 7-59) - is located greater than 400m, but within 600m of a proposed longwall. It may therefore express subsidence effects if hydrological and fire effects are allowed to interact.

A review of mitigation and remediation techniques found that 'no strategies - other than changes in mine plan layout - have been proven to effectively mitigate longwall mining impacts', and that existing remediation techniques are unproven and appear insufficient without destruction of the surface environment' (Commonwealth of Australia 2014). As there is no evidence that losses could be compensated with gains of similar magnitude, **impact avoidance through changes in mine design is the only strategy within the mitigation hierarchy that could ensure no-net-loss of biodiversity and hydrological function**.

References

Advisian WorleyParsons Group (2016). Literature review of underground mining beneath catchments and water bodies.
https://www.waternsw.com.au/__data/assets/pdf_file/0011/127559/20161223-WaterNSW-Literature-Review-Underground-Mining-V3.pdf, WaterNSW.

Boakes, E. H., G. M. Mace, P. J. K. McGowan and R. A. Fuller (2010). "Extreme contagion in global habitat clearance." Proceedings of the Royal Society of London Series B - Biological Sciences **277**: 1081-1085.

Commonwealth of Australia (2014). Temperate highland peat swamps on sandstone: evaluation of mitigation and remediation techniques, knowledge report, prepared by the Water Research Laboratory, University of New South Wales, for the Department of the Environment. Canberra, Commonwealth of Australia: 106.

David, K., W. A. Timms, S. L. Barbour and R. Mitra (2017). "Tracking changes in the specific storage of overburden rock during longwall coal mining." Journal of Hydrology **553**: 307-320.

Department of the Environment (2014). Conservation advice (including listing advice) for Coastal Upland Swamps in the Sydney Basin Bioregion. Canberra, Department of the Environment.

Keith, D. A., D. H. Benson, I. R. C. Baird, L. Watts, C. C. Simpson, M. Krogh, S. Gorissen, J. R. Ferrer-Paris and T. J. Mason (2022). "Interactions between anthropogenic stressors and recurring perturbations mediate ecosystem resilience or collapse." Conservation Biology preprint <https://biorxiv.org/cgi/content/short/2022.03.27.485937v1>.

Keith, D. A., J. Elith and C. C. Simpson (2014). "Predicting distribution changes of a mire ecosystem under future climates." Diversity & Distributions **20**: 440-454.

Mason, T. J., M. Krogh, G. C. Popovic, W. Glamore and D. A. Keith (2021). "Persistent effects of underground longwall coal mining on freshwater wetland hydrology." Science of the Total Environment **772**: 144772.

Mason, T. J., G. C. Popovic, M. McGillicuddy, D.A. Keith (in review) "Effects of hydrological change in fire-prone wetland vegetation: an empirical simulation." Journal of Ecology

Raiter, K. G., H. P. Possingham, S. M. Prober and R. J. Hobbs (2014). "Under the radar: mitigating enigmatic ecological impacts." Trends in Ecology and Evolution **29**: 635-644.

Watershed HydroGeo (2022). Illawarra Metallurgical Coal Dendrobium mine extension project (DMEP) Groundwater assessment. <https://www.planningportal.nsw.gov.au/major-projects/projects/dendrobium-mine-extension-project-0>, Watershed HydroGeo Pty Ltd: 439.

Zedler, J. B. and S. Kercher (2005). "Wetland resources: status, trends, ecosystem services, and restorability." Annual Review of Environment and Resources **30**: 39-74.

Dr Tanya Mason

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Research interests

I am a community plant ecologist with particular interest in long term vegetation dynamics, disturbance ecology and invasion ecology. In my current research, I use field survey, glasshouse and microcosm experiments and remote sensing approaches to investigate the effects of disturbance on vegetation communities. My research informs both ecological theory and conservation practice.

Education

2002-2006: PhD, University of Wollongong. Recipient of APA and CSIRO scholarships

1994-1998: Bachelor of Science, University of New South Wales. First class Honours in Environmental Science (Biology)

Employment history

2018-present: Senior Scientist (Level 9), Department of Planning, Industry and Environment, Lidcombe

2012-present: Research Fellow (Level B), University of New South Wales

2006-2011: Associate Research Fellow (Level A), University of Wollongong

July 2008-December 2008: Casual Lecturer (Level B) and Subject Coordinator, University of Technology Sydney

February-June 2008 Part time Lecturer (Level B), University of Wollongong

April-December 2006: Casual Research Assistant, University of Wollongong

2002-2006: PhD candidate, University of Wollongong

2002-2006: Casual Lecturer, Demonstrator, Tutor and Marker University of Wollongong

2005: Casual Teaching Associate, Illawarra Environmental Education Centre

2000-2002: Project officer *Bushfire & Environmental Services Pty Ltd, Bush & Land Care Services*

Feb-April 1999: Volunteer for the Sagarmatha Community Agro-Forestry Project (SCAFP) World Wide Fund for Nature Nepal Programme, Everest Region, Nepal

Oct 1998-Nov 1998 Temporary Research Assistant UNSW, Sydney

Major research projects

Senior scientist research 2018-present: *Effects of environmental flows on vegetation of wetlands in the northern Murray-Darling Basin*

Postdoctoral fellow research 2015-present: *Predicting swamp community persistence after underground mining*

Postdoctoral fellow research 2012-present: *Vegetation, biogeography and conservation status of temperate highland swamps*

Postdoctoral fellow research 2006-2011: *Understanding and determining mechanisms to prevent invasion in coastal vegetation*

Herman-Slade Foundation and Natural Heritage Trust Grant research 2006: *Understanding seed bank and competition dynamics of fore dune communities*

PhD thesis 2002-2006: *Impacts of plant invaders and management techniques on native communities: ecological and social perspectives at regional and global levels*

Honours thesis 1998: *Weed invasion and native vegetation responses at urban edges in Northern Sydney*

Fellowships and Scholarships

2018-present: NSW Environmental Trust \$349 757

2015-2018: NSW Environmental Trust \$149 133

2012-2015: Temperate Highland Swamps on Sandstone \$223 730

Dec 2006-2011: Land and Water Defeating the Weed Menace (Prof French principal investigator) \$286 371

2008: NSW Environmental Trust – Restoration and Rehabilitation Community Grants Program (Prof French principal investigator) \$88 465

2008: NSW Environmental Trust - Environmental Research Program Seeding Grant (Prof French principal investigator) \$19 840

2002-2005: Australian Postgraduate Award \$60 000

2004-2010: Institute for Conservation Biology and Environmental Management travel grants \$2 500

2002-2004: CSIRO Doctoral Scholarship including stipend, project funding and travel assistance \$38 000

Other skills and qualifications

2013 & 2019 **Statistics and R workshop**, UNSW

2013 **St John Ambulance Australia Apply First Aid and Remote Area First Aid**

2008 **4WD skills course**

2003-present Journal reviewer (*PLOS One*, *Conservation Biology*, *Journal of Ecology*, *Austral Ecology*, *Biological Invasions*, *Natural Areas Journal*)

2006 Recertification for **Senior First Aid Certificate**

2005 **Science-writing Workshop**, University of Wollongong

2001 **Bushlands Regeneration Certificate 4**, TAFE, Yallah Campus

2001 **National Farm Chemical Users Accreditation**

1993-present Current unblemished **driver's licence**

Selected publications

Mason, T.J., Krogh, M., Popovic, G., Glamore, W. and Keith, D.A. (in review) Persistent effects of underground longwall coal mining on freshwater wetland hydrology. *Science of the Total Environment*.

Lyons, M.B., Keith, D. A., Phinn, S.R., **Mason, T.J.** & Elith, J. (2018) A comparison of resampling methods for remote sensing classification and accuracy assessment. *Remote Sensing of Environment* **208**: 145-153.

Mason, T.J., Keith, D.A. and Letten, A.D. (2017) Detecting state changes for ecosystem conservation with long-term monitoring of species composition. *Ecological Applications* **27**(2): 458-468.

Mason, T.J., French, K. and Jolley, D.F. (2017) Functional richness and identity do not strongly affect invasibility of constructed dune communities. *PLoS ONE* **12**(1): e0169243.doi: 10.1371/journal.pone.0169243

Mason, T.J. and Keith, D.A. (2016) Vegetation change and conservation status of Coastal Upland Swamps. *Ecological Management and Restoration* **17**(3): 1-4.

French, K., Gooden, B. **Mason, T.** (2014) Invasion of woody shrubs and trees Pages 285-303 in H. Prins and I. Gordon, editors. *Invasion Biology and Ecological Theory*. Cambridge University Press, New York.

Mason, T.J., French, K. Jolley, D. (2013) Arrival order among native plant functional groups does not affect invasibility of constructed dune communities. *Oecologia*. **173** (2): 557-568.

Mason, T.J., French, K. and Russell, K.G. (2012) Are competitive effects of native species on an invader mediated by water availability? *Journal of Vegetation Science*. **23**: 657-666.

French, K., **Mason, T.** and Sullivan, N. (2011) Recruitment limitation of native species in invaded coastal dune communities. *Plant Ecology* **212** (4): 601-609.

Mason, T.J., French, K. and Lonsdale, W.M. (2009) Do graminoid and woody invaders have different effects on species richness within plant functional groups in native communities? *Journal of Applied Ecology*, **46**: 426-433.

Mason, T.J. and French, K. (2008). Impacts of a woody invader vary in different vegetation communities. *Diversity and Distributions*. **14**: 829-838.

French, K., Ens, E., Gosper, C.R., Lindsay, E., **Mason, T.** Owers, B. Sullivan, N. (2008). Management implications of recent research into the effect of bitou bush invasion. *Plant Protection Quarterly* **23** (1): 24-28.

Mason, T.J. and French, K. (2007). Management regimes for plant invaders differentially impact resident communities. *Biological Conservation* **136**: 246-259.

Mason, T.J., French, K. and Russell, K.G. (2007). Moderate impacts of plant invasion and management regimes in coastal hind dune seed banks. *Biological Conservation* **134**: 428-439.

Mason, T.J., Lonsdale, W.M. and French, K. (2005) Environmental weed control policy in Australia: current approaches, policy limitations and future directions. *Pacific Conservation Biology* **11** (4): 233-245

Professional societies

2015-present Associate Editor *Austral Ecology* and member Ecological Society of Australia



Environmental Defenders Office

25 May 2022

Dr Tanya Mason
Research Fellow
Centre for Ecosystem Science
University of NSW

By email: t.mason@unsw.edu.au

CONFIDENTIAL AND PRIVILEGED

Dear Dr Mason,

Brief to Expert – Dendrobium Mine Extension Project SSI – 33143123

1. We act for Protect Our Water Catchment (**POWC**) in relation to the proposed [Dendrobium Mine Extension Project \(SSI - 33143123\)](#) (**Project**) by Illawarra Coal Holdings Pty Ltd (**Applicant**), a subsidiary of South32 Limited.
2. The Project is an extension of the Applicant's existing underground coal mine located around 8 km west of Wollongong in the Southern Coalfield of New South Wales (**NSW**). The Applicant is seeking development consent to extract up to 5.2 million tonnes per annum (Mtpa) of ROM coal, through underground mining operations within Area 5 (location of the Project) until approximately 2035, in extending the life of Dendrobium Mine until 2041. The Project is a redesign of the Applicant's previous Significant State Development (**SSD**) application ([Dendrobium Extension Project, SSD 8194](#)).
3. Our client intends to make a submission on the Project, which is currently being publicly exhibited, to ensure the decision-maker has independent expert advice on the Project.
4. We seek to engage you on behalf of our client to review the environmental impact statement (**EIS**) for the Project and prepare an independent expert report in relation to your area of expertise, upland swamp ecosystems, in accordance with the *Uniform Civil Procedure Rules 2005* (UCPR) and the Expert Witness Code of Conduct.

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Background

5. On 5 February 2021, the Applicant's SSD application ([Dendrobium Extension Project, SSD 8194](#)) for the Project was refused by the Independent Planning Commission (**IPC**). The Applicant appealed the IPC's decision, which is currently the subject of a judicial review proceedings in the Land and Environment Court of New South Wales.
6. On or around December 2021, the Applicant submitted a [scoping report](#) for the re-designed SSD Project in support of the application for the Project to be assessed as 'State significant infrastructure' (**SSI**).
7. On 2 December 2021, the Project was declared SSI by the Minister for Planning and Public Spaces.
8. On 23 December 2021, the Department of Planning, Industry and Environment (now the Department of Planning and Environment) issued the Planning Secretary's environmental assessment requirements (SEARs) for the Project.
9. On 4 May 2022, the Project application, EIS and accompanying documents were placed on public exhibition.

Purpose of your expert report

10. We note as a preliminary matter that our primary purpose in briefing you to prepare your report is to provide independent expert advice in your area of expertise. We do not ask you to be an advocate for our client/s. You are requested to prepare an independent report that is clear and well-written.
11. In this respect, we draw your attention to Part 31 Division 2 of the *Uniform Civil Procedure Rules 2005* (NSW) (**UCPR**) and the Expert Witness Code of Conduct (**Code of Conduct**) which govern the use of expert evidence in NSW Courts (**attached**). The SSI public exhibition process is not a Court proceeding; however, we are of the view that the same Code of Conduct should be adhered to in this instance.
12. In particular, clause 2 of the Code of Conduct states that:

“An expert witness is not an advocate for a party and has a paramount duty, overriding any duty to the party to the proceedings or other person retaining the expert witness, to assist the court impartially on matters relevant to the area of expertise of the witness.”
13. Your expert report must contain an acknowledgment that you have read the Expert Witness Code of Conduct and that you agree to be bound by it.
14. Your expert report will be used as evidence in chief of your professional opinion. Information of which you believe the decision maker should be aware must be contained in your expert report.

15. In providing your opinion to the decision maker you must set out all the assumptions upon which the opinion is based. This may include, for example, facts observed as a result of fieldwork or ‘assumed’ facts based on a body of scientific opinion. If the latter, you should provide references which demonstrate the existence of that body of opinion.
16. Your expert report must also set out the process of reasoning which you have undertaken in order to arrive at your conclusions. It is insufficient for an expert report to simply state your opinion or conclusion reached without an explanation as to how this was arrived at. The purpose of providing such assumptions and reasoning is to enable the decision maker and experts engaged by other parties to make an assessment as to the soundness of your opinion.

Overview of work requested

17. We request that you undertake the following work:
 - a. review the documents listed below;
 - b. prepare a written expert report that addresses the issues identified below (‘Issues to address in your expert report’); and
 - c. ensure that the work is prepared in accordance with independent expert advice as indicated above.

Documents

18. We enclose the Code of Conduct and Part 31 Division 2 of the UCPR.
19. If you have previously reviewed relevant EIS documents for the previous SSD application (Dendrobium Extension Project, SSD 8194) you may wish to review your previous expert advice.
20. Full Project documentation is available at the following website:
 - a) NSW Government Planning Portal: <https://www.planningportal.nsw.gov.au/major-projects/projects/dendrobium-mine-extension-project-0>
21. The following documents relating to the Project are provided for your particular consideration:
 - Environmental Impact Statement
 - Executive Summary,
<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220427T061031.074%20GMT>
 - Section 1 – Introduction,
<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220427T061031.900%20GMT>
 - Section 4 – Project Description,
<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220429T025120.565%20GMT>, p. 4-24

Section 7 – Environmental Assessment,

<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220427T061037.452%20GMT>, pp. 7-5 to 7-13, 7-37 to 7-64

Appendix C – Surface Water Assessment,

<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220427T061046.806%20GMT>

Appendix D – Biodiversity Report (BDAR),

<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220427T061057.788%20GMT>

Appendix E – Aquatic Ecology Assessment,

<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-33143123%2120220427T061047.301%20GMT>

22. IMC (2020). Illawarra Metallurgical Coal. Dendrobium Area 3B Watercourse Impact Monitoring, Management and Contingency Plan. https://www.south32.net/docs/default-source/illawarra-coal/dendrobium/subsidence-management-plans---longwalls-14-19/attachment-s-dendrobium-area-3-environmental-performance.pdf?sfvrsn=18df35db_4
23. Other documents relating to the SSD application that may be of relevance include:
 - a) Dendrobium Extension Project SSD 8194 – Project Area (see attached).
24. You are not limited to the above documents, if there is other material relevant to your expert report, you may wish to refer to this material.

Issues to address in your expert report

25. We ask that your report addresses the following issues in regard to any impacts arising as a result of the Project:
 - a. In your opinion, is the redesigned Project likely to have a significant impact on upland swamp ecosystems? Please provide reasoning for your answer.
 - b. The Applicant claims that the design of the Project (revised from the earlier refused SSD application) “includes avoidance of key surface features, which would reduce potential impacts to aquatic habitat [and] upland swamp” (e.g. “approximately 40% reduction in the number of swamps (listed as threatened) longwall mined beneath”; “avoidance of the ‘Area 4’ swamp cluster”). In your opinion, are these justifiable and accurate statements?
 - c. Mining subsidence can have deleterious effects on local water resources. In your opinion, have the risks of subsidence been evaluated appropriately as to their potential to harm local water resources—quantity or quality?
 - d. In your opinion, is the impact of water use by the mine as envisaged in its extension fully considered in the environmental impact statement, as it applies to surface water and drainage?

- e. The Project proposal indicates that the Applicant will continue to conduct aquatic ecology monitoring under 'Mitigation Measures and Monitoring' (see IMC 2020). In your view is the monitoring sufficiently rigorous and robust to meet its aims, track deleterious environmental changes, and inform mitigation activities, if required?
 - f. Provide any further observations or opinions which you consider to be relevant.
26. We request that you provide us with a draft of your report for review before finalising it. We emphasise that the purpose of this is not to influence the conclusions or recommendations you make but to ensure that the language and expression of the report is clear and complies with the formal legal requirements of an expert report.

Key dates

27. The Project application, EIS and accompanying documents are on public exhibition from Wednesday 4 May 2022 until 14 June 2022.
28. We kindly request a draft of your expert advice by no later than **Monday 6 June 2022**.
29. Please provide your final expert advice by no later than **Thursday 9 June 2022**.

Duty of confidentiality

30. Please treat your work as strictly confidential, unless authorised otherwise by us. Please mark all documents prepared for the purposes of this brief as "Privileged & Confidential".

Fees and Terms

31. Thank-you for agreeing to provide your advice in this matter on a pro bono basis. EDO relies on experts such as you to assist in matters with very little financial compensation.
32. Please note the following terms:
- a. your work will only be used by EDO to relation to this matter;
 - b. Either EDO or our client may choose to make your expert advice publicly available. Any public release of your report may result in disclosure of any works in your report over which you may claim copyright;
 - c. EDO will take all reasonable steps to prevent your work being used for purposes other than that mentioned above, but we accept no responsibility for the actions of third parties;
 - d. regardless of the above points, EDO may choose not to use your work; and
 - e. you will not be covered by the EDO's insurance while undertaking the above tasks.
33. If you would like to discuss this brief further, please contact Jayme Cooper via email jayme.cooper@edo.org.au (cc: matthew.floro@edo.org.au and edward.butler@edo.org.au).

We are grateful for your assistance in this matter.

Yours sincerely,

Environmental Defenders Office

A handwritten signature in black ink, appearing to read 'Jayme Cooper', with a large, stylized initial 'J'.

Jayme Cooper
Solicitor

Reference number: s 3326



Uniform Civil Procedure Rules 2005

Current version for 1 December 2021 to date (accessed 25 May 2022 at 13:36)

Schedule 7

Schedule 7 Expert witness code of conduct

(Rule 31.23)

1 Application of code

This code of conduct applies to any expert witness engaged or appointed—

- (a) to provide an expert's report for use as evidence in proceedings or proposed proceedings, or
- (b) to give opinion evidence in proceedings or proposed proceedings.

2 General duties to the Court

An expert witness is not an advocate for a party and has a paramount duty, overriding any duty to the party to the proceedings or other person retaining the expert witness, to assist the court impartially on matters relevant to the area of expertise of the witness.

3 Content of report

Every report prepared by an expert witness for use in court must clearly state the opinion or opinions of the expert and must state, specify or provide—

- (a) the name and address of the expert, and
- (b) an acknowledgement that the expert has read this code and agrees to be bound by it, and
- (c) the qualifications of the expert to prepare the report, and
- (d) the assumptions and material facts on which each opinion expressed in the report is based (a letter of instructions may be annexed), and
- (e) the reasons for and any literature or other materials utilised in support of each such opinion, and
- (f) (if applicable) that a particular question, issue or matter falls outside the expert's field of expertise, and
- (g) any examinations, tests or other investigations on which the expert has relied, identifying the person who carried them out and that person's qualifications, and
- (h) the extent to which any opinion which the expert has expressed involves the acceptance of another person's opinion, the identification of that other person and the opinion expressed by that other person, and
- (i) a declaration that the expert has made all the inquiries which the expert believes are desirable and appropriate (save for any matters identified explicitly in the report), and that no matters of significance which the expert regards as relevant have, to the knowledge of the expert, been withheld from the court, and
- (j) any qualification of an opinion expressed in the report without which the report is or may be incomplete or inaccurate, and

(k) whether any opinion expressed in the report is not a concluded opinion because of insufficient research or insufficient data or for any other reason, and

(l) where the report is lengthy or complex, a brief summary of the report at the beginning of the report.

4 Supplementary report following change of opinion

(1) Where an expert witness has provided to a party (or that party's legal representative) a report for use in court, and the expert thereafter changes his or her opinion on a material matter, the expert must forthwith provide to the party (or that party's legal representative) a supplementary report which must state, specify or provide the information referred to in clause 3(a), (d), (e), (g), (h), (i), (j), (k) and (l), and if applicable, clause 3(f).

(2) In any subsequent report (whether prepared in accordance with subclause (1) or not), the expert may refer to material contained in the earlier report without repeating it.

5 Duty to comply with the court's directions

If directed to do so by the court, an expert witness must—

(a) confer with any other expert witness, and

(b) provide the court with a joint report specifying (as the case requires) matters agreed and matters not agreed and the reasons for the experts not agreeing, and

(c) abide in a timely way by any direction of the court.

6 Conferences of experts

Each expert witness must—

(a) exercise his or her independent judgment in relation to every conference in which the expert participates pursuant to a direction of the court and in relation to each report thereafter provided, and must not act on any instruction or request to withhold or avoid agreement, and

(b) endeavour to reach agreement with the other expert witness (or witnesses) on any issue in dispute between them, or failing agreement, endeavour to identify and clarify the basis of disagreement on the issues which are in dispute.



Uniform Civil Procedure Rules 2005

Current version for 1 December 2021 to date (accessed 25 May 2022 at 13:36)

[Part 31](#) > Division 2

Division 2 Provisions applicable to expert evidence generally

Note—

The provisions of this Division replace those of former Divisions 2 and 3, as in force immediately before 8 December 2006. The numbering of the individual provisions of this Division varies considerably from that of the provisions of the former Divisions. The following Table identifies the new rules corresponding to former rules 31.17–31.35.

Table

Former rule	New rule
Rule 31.17	Rule 31.18
Rule 31.18	Rule 31.28
Rule 31.18A	Rule 31.29
Rule 31.19	Rule 31.30
Rule 31.20	Rule 31.31
Rule 31.21	Rule 31.32
Rule 31.22	Rule 31.33
Rule 31.23	Rule 31.27
Rule 31.24	Rule 31.34
Rule 31.25	Rules 31.24 and 31.26
Rule 31.26	Rule 31.35
Rule 31.27	Rule 31.36
Rule 31.28	Rule 31.18
Rule 31.29	Rule 31.46
Rule 31.30	Rule 31.23
Rule 31.31	Rule 31.49
Rule 31.32	Rule 31.51
Rule 31.33	Rule 31.52
Rule 31.34	Rule 31.53
Rule 31.35	Rule 31.54

Subdivision 1 Preliminary

31.17 Main purposes of Division (cf Queensland *Uniform Civil Procedure Rules 1999*, rule 423; United Kingdom *Civil Procedure Rules 1998*, rule 35.1)

The main purposes of this Division are as follows—

- (a) to ensure that the court has control over the giving of expert evidence,
- (b) to restrict expert evidence in proceedings to that which is reasonably required to resolve the proceedings,
- (c) to avoid unnecessary costs associated with parties to proceedings retaining different experts,
- (d) if it is practicable to do so without compromising the interests of justice, to enable expert evidence to be given on an issue in proceedings by a single expert engaged by the parties or appointed by the court,
- (e) if it is necessary to do so to ensure a fair trial of proceedings, to allow for more than one expert (but no more than are necessary) to give evidence on an issue in the proceedings,
- (f) to declare the duty of an expert witness in relation to the court and the parties to proceedings.

31.18 Definitions (cf SCR Part 36, rules 13A and 13C; DCR Part 28, rule 8; LCR Part 23, rule 1D)

In this Division—

court-appointed expert means an expert appointed pursuant to rule 31.46.

expert, in relation to any issue, means a person who has such knowledge or experience of, or in connection with, that issue, or issues of the character of that issue, that his or her opinion on that issue would be admissible in evidence.

expert witness means an expert engaged or appointed for the purpose of—

- (a) providing an expert's report for use as evidence in proceedings or proposed proceedings, or
- (b) giving opinion evidence in proceedings or proposed proceedings.

expert's report means a written statement by an expert (whether or not an expert witness in the proceedings concerned) that sets out the expert's opinion and the facts, and assumptions of fact, on which the opinion is based.

hospital report means a written statement concerning a patient, made by or on behalf of a hospital, that the party serving the statement intends to adduce in evidence in chief at the trial.

parties' single expert means an expert engaged pursuant to rule 31.37.

Subdivision 2 Expert witnesses generally

31.19 Parties to seek directions before calling expert witnesses

- (1) Any party—
 - (a) intending to adduce expert evidence at trial, or
 - (b) to whom it becomes apparent that he or she, or any other party, may adduce expert evidence at trial,
 must promptly seek directions from the court in that regard.
- (2) Directions under this rule may be sought at any directions hearing or case management conference or, if no such hearing or conference has been fixed or is imminent, by notice of motion or pursuant to liberty to restore.
- (3) Unless the court otherwise orders, expert evidence may not be adduced at trial—
 - (a) unless directions have been sought in accordance with this rule, and
 - (b) if any such directions have been given by the court, otherwise than in accordance with those directions.
- (4) This rule does not apply to proceedings with respect to a professional negligence claim.

31.20 Court may give directions regarding expert witnesses

- (1) Without limiting its other powers to give directions, the court may at any time give such directions as it considers appropriate in relation to the use of expert evidence in proceedings.
- (2) Directions under this rule may include any of the following—
 - (a) a direction as to the time for service of experts' reports,
 - (b) a direction that expert evidence may not be adduced on a specified issue,
 - (c) a direction that expert evidence may not be adduced on a specified issue except by leave of the court,
 - (d) a direction that expert evidence may be adduced on specified issues only,
 - (e) a direction limiting the number of expert witnesses who may be called to give evidence on a specified issue,
 - (f) a direction providing for the engagement and instruction of a parties' single expert in relation to a specified issue,
 - (g) a direction providing for the appointment and instruction of a court-appointed expert in relation to a specified issue,
 - (h) a direction requiring experts in relation to the same issue to confer, either before or after preparing experts' reports in relation to a specified issue,
 - (i) any other direction that may assist an expert in the exercise of the expert's functions,
 - (j) a direction that an expert who has prepared more than one expert's report in relation to any proceedings is to prepare a single report that reflects his or her evidence in chief.

31.21 Expert evidence in chief to be given by way of experts' reports

Unless the court otherwise orders, an expert witness's evidence in chief must be given by the tender of one or more expert's reports.

31.22 Expert witness to provide details of contingency fees or deferred payment schemes

- (1) A person who is engaged as an expert witness in relation to any proceedings must include information as to any arrangements under which—
 - (a) the charging of fees or costs by the expert witness is contingent on the outcome of the proceedings, or
 - (b) the payment of any fees or costs to the expert witness is to be deferred,in, or in an annexure to, any report that he or she prepares for the purposes of the proceedings.
- (2) If a report referred to in subrule (1) indicates the existence of any such arrangements, the court may direct disclosure of the terms of the engagement (including as to fees and costs).

31.23 Code of conduct (cf SCR Part 39, rule 2; DCR Part 28A, rule 2; LCR Part 38B, rule 2)

- (1) An expert witness must comply with the code of conduct set out in Schedule 7.
- (2) As soon as practicable after an expert witness is engaged or appointed—
 - (a) in the case of an expert witness engaged by one or more parties, the engaging parties, or one of them as they may agree, or
 - (b) in the case of an expert witness appointed by the court, such of the affected parties as the court may direct, must provide the expert witness with a copy of the code of conduct.

- (3) Unless the court otherwise orders, an expert's report may not be admitted in evidence unless the report contains an acknowledgment by the expert witness by whom it was prepared that he or she has read the code of conduct and agrees to be bound by it.
- (4) Unless the court otherwise orders, oral evidence may not be received from an expert witness unless the court is satisfied that the expert witness has acknowledged, whether in an expert's report prepared in relation to the proceedings or otherwise in relation to the proceedings, that he or she has read the code of conduct and agrees to be bound by it.

31.24 Conference between expert witnesses (cf SCR Part 36, rule 13CA; DCR Part 28, rule 9D; LCR Part 23, rule 1E)

- (1) The court may direct expert witnesses—
 - (a) to confer, either generally or in relation to specified matters, and
 - (b) to endeavour to reach agreement on any matters in issue, and
 - (c) to prepare a joint report, specifying matters agreed and matters not agreed and reasons for any disagreement, and
 - (d) to base any joint report on specified facts or assumptions of fact,and may do so at any time, whether before or after the expert witnesses have furnished their experts' reports.
- (2) The court may direct that a conference be held—
 - (a) with or without the attendance of the parties affected or their legal representatives, or
 - (b) with or without the attendance of the parties affected or their legal representatives, at the option of the parties, or
 - (c) with or without the attendance of a facilitator (that is, a person who is independent of the parties and who may or may not be an expert in relation to the matters in issue).
- (3) An expert witness so directed may apply to the court for further directions to assist the expert witness in the performance of his or her functions in any respect.
- (4) Any such application must be made by sending a written request for directions to the court, specifying the matter in relation to which directions are sought.
- (5) An expert witness who makes such an application must send a copy of the request to the other expert witnesses and to the parties affected.
- (6) Unless the parties affected agree, the content of the conference between the expert witnesses must not be referred to at any hearing.

31.25 Instructions to expert witnesses where conference ordered before report furnished

If a direction to confer is given under rule 31.24(1)(a) before the expert witnesses have furnished their reports, the court may give directions as to—

- (a) the issues to be dealt with in a joint report by the expert witnesses, and
- (b) the facts, and assumptions of fact, on which the report is to be based,

including a direction that the parties affected must endeavour to agree on the instructions to be provided to the expert witnesses.

31.26 Joint report arising from conference between expert witnesses (cf SCR Part 36, rule 13CA; DCR Part 28, rule 9D; LCR Part 23, rule 1E)

- (1) This rule applies if expert witnesses prepare a joint report as referred to in rule 31.24(1)(c).
- (2) The joint report must specify matters agreed and matters not agreed and the reasons for any disagreement.
- (3) The joint report may be tendered at the trial as evidence of any matters agreed.
- (4) In relation to any matters not agreed, the joint report may be used or tendered at the trial only in accordance with the rules of evidence and the practices of the court.
- (5) Except by leave of the court, a party affected may not adduce evidence from any other expert witness on the issues dealt with in the joint report.

Subdivision 3 Experts' reports and expert evidence

31.27 Experts' reports (cf SCR Part 36, rule 13C; DCR Part 28, rule 9C; LCR Part 23, rule 1D)

- (1) An expert's report must (in the body of the report or in an annexure to it) include the following—
 - (a) the expert's qualifications as an expert on the issue the subject of the report,
 - (b) the facts, and assumptions of fact, on which the opinions in the report are based (a letter of instructions may be annexed),
 - (c) the expert's reasons for each opinion expressed,
 - (d) if applicable, that a particular issue falls outside the expert's field of expertise,
 - (e) any literature or other materials utilised in support of the opinions,
 - (f) any examinations, tests or other investigations on which the expert has relied, including details of the qualifications of the person who carried them out,
 - (g) in the case of a report that is lengthy or complex, a brief summary of the report (to be located at the beginning of the report).
- (2) If an expert witness who prepares an expert's report believes that it may be incomplete or inaccurate without some qualification, the qualification must be stated in the report.
- (3) If an expert witness considers that his or her opinion is not a concluded opinion because of insufficient research or insufficient data or for any other reason, this must be stated when the opinion is expressed.
- (4) If an expert witness changes his or her opinion on a material matter after providing an expert's report to the party engaging him or her (or that party's legal representative), the expert witness must forthwith provide the engaging party (or that party's legal representative) with a supplementary report to that effect containing such of the information referred to in subrule (1) as is appropriate.

31.28 Disclosure of experts' reports and hospital reports (cf SCR Part 36, rule 13A; DCR Part 28, rule 8; LCR Part 23, rule 3)

- (1) Each party must serve experts' reports and hospital reports on each other active party—
 - (a) in accordance with any order of the court, or
 - (b) if no such order is in force, in accordance with any relevant practice note, or
 - (c) if no such order or practice note is in force, not later than 28 days before the date of the hearing at which the report is to be used.
- (2) An application to the court for an order under subrule (1) (other than an order solely for abridgment or extension of time) may be made without serving notice of motion.

- (3) Except by leave of the court, or by consent of the parties—
 - (a) an expert's report or hospital report is not admissible unless it has been served in accordance with this rule, and
 - (b) without limiting paragraph (a), an expert's report or hospital report, when tendered under section 63, 64 or 69 of the [Evidence Act 1995](#), is not admissible unless it has been served in accordance with this rule, and
 - (c) the oral expert evidence in chief of any expert is not admissible unless an expert's report or hospital report served in accordance with this rule contains the substance of the matters sought to be adduced in evidence.
- (4) Leave is not to be given as referred to in subrule (3) unless the court is satisfied—
 - (a) that there are exceptional circumstances that warrant the granting of leave, or
 - (b) that the report concerned merely updates an earlier version of a report that has been served in accordance with subrule (1).

31.29 Admissibility of expert's report (cf SCR Part 36, rule 13B)

- (1) If an expert's report is served in accordance with rule 31.28 or in accordance with an order of the court, the report is admissible—
 - (a) as evidence of the expert's opinion, and
 - (b) if the expert's direct oral evidence of a fact on which the opinion was based would be admissible, as evidence of that fact,

without further evidence, oral or otherwise.
- (2) Unless the court otherwise orders, a party may require the attendance for cross-examination of the expert by whom the report was prepared by notice served on the party by whom the report was served.
- (3) Unless the court otherwise orders, such a requirement may not be made later than—
 - (a) in the case of proceedings for which the court has fixed a date for trial, 35 days before the date so fixed, or
 - (b) in any other case, 7 days before the date on which the court fixes a date for trial.
- (4) The parties may not by consent abridge the time fixed by or under subrule (3).
- (5) If the expert's attendance for cross-examination is required under subrule (2), the report may not be tendered under section 63, 64 or 69 of the [Evidence Act 1995](#) or otherwise used unless the expert attends or is dead or the court grants leave to use it.
- (6) The party using the report may re-examine the expert if the expert attends for cross-examination pursuant to a requirement under subrule (2).
- (7) This rule does not apply to proceedings in the District Court or the Local Court or to proceedings on a trial with a jury.

31.30 Admissibility of expert's report in District Court and Local Court (cf DCR Part 28, rule 9; LCR Part 23, rule 2)

- (1) This rule applies to proceedings in the District Court or the Local Court.
- (2) If an expert's report is served in accordance with rule 31.28 or in accordance with an order of the court, the report is admissible—
 - (a) as evidence of the expert's opinion, and

- (b) if the expert's direct oral evidence of a fact on which the opinion was based would be admissible, as evidence of that fact,

without further evidence, oral or otherwise.

- (3) Unless the court orders otherwise—
- (a) it is the responsibility of the party requiring the attendance for cross-examination of the expert by whom an expert's report has been prepared to procure that attendance, and
- (b) the party requiring the expert's attendance must notify the expert at least 28 days before the date on which attendance is required.
- (4) Except for the purpose of determining any liability for conduct money or witness expenses, an expert does not become the witness for the party requiring his or her attendance merely because his or her attendance at court has been procured by that party.
- (5) A party who requires the attendance of a person as referred to in subrule (2)—
- (a) must inform all other parties to the proceedings that the party has done so at least 28 days before the date fixed for hearing, and
- (b) must pay to the person whose attendance is required (whether before or after the attendance) an amount sufficient to meet the person's reasonable expenses (including any standby fees) in complying with the requirement.
- (6) If the attendance of an expert is required under subrule (2), the report may not be tendered under section 63, 64 or 69 of the [Evidence Act 1995](#) or otherwise used unless the expert attends or is dead or the court grants leave to use it.
- (7) The party using an expert's report may re-examine an expert who attends for cross-examination under a requirement under subrule (2).
- (8) This rule does not apply to proceedings on a trial with a jury.

31.31 Fees for medical expert for compliance with subpoena (cf SCR Part 36, rule 13BA)

- (1) If a subpoena is served on a medical expert who is to give evidence of medical matters but is not called as a witness, the expert is, unless the court orders otherwise, entitled to be paid, in addition to any other amount payable to the expert, the amount specified in item 2 of Schedule 3.
- (2) The amount payable under subrule (1) must be paid to the expert by the issuing party within 28 days after the date for the expert's attendance.
- (3) A party that requires an expert's attendance under rule 31.29(2), but subsequently revokes it, must pay to the issuing party any amount paid by the issuing party under subrule (2), but otherwise such an amount is not recoverable by the issuing party from any other party unless the court so orders.
- (4) In this rule, *issuing party* means the party at whose request a subpoena is issued.

31.32 Service of subpoena on medical expert (cf SCR Part 36, rule 13BB)

- (1) Service of a subpoena on a medical expert may be effected, at any place at which the expert's practice is carried on, by handing it over to a person who is apparently engaged in the practice (whether as an employee or otherwise) and is apparently of or above the age of 16 years.
- (2) If a person refuses to accept a subpoena when it is handed over, the subpoena may be served by putting it down in the person's presence after he or she has been told of its nature.

- (3) If a subpoena requires a medical expert to attend court on a specified date for the purpose of giving evidence on medical matters, it must be served on the expert not later than 21 days before the date so specified unless the court orders otherwise.
- (4) The parties may not by consent abridge the time fixed by or under subrule (3).

31.33 Subpoena requiring production of medical records (cf SCR Part 36, rule 13BC)

- (1) A subpoena for production may require a medical expert to produce medical records or copies of them.
- (2) A person is not required to comply with a subpoena for production referred to in subrule (1) unless the amount specified in item 3 of Schedule 3 is paid or tendered to the person at the time of service of the subpoena or a reasonable time before the date on which production is required.
- (3) Rule 33.6 (Compliance with subpoena) does not apply to a subpoena to which subrule (1) applies.
- (4) Rule 33.7 (Production otherwise than on attendance) applies to the photocopies in the same way as it applies to the records.
- (5) If, after service of a subpoena for production referred to in subrule (1), the party who requested the issue of the subpoena requires production of the original medical records without the option of producing copies of them, the party must request the issue of, and serve, another subpoena requiring production of the original medical records.

31.34 Supplementary reports by expert witness (cf SCR Part 36, rule 13C; DCR Part 28, rule 9C; LCR Part 23, rule 1D)

- (1) If an expert witness provides a supplementary report to the party by whom he or she has been engaged, neither the engaging party nor any other party having the same interest as the engaging party may use—
 - (a) the supplementary report, or
 - (b) any earlier report affected by the supplementary report,
 unless all of those reports have been served on all parties affected.
- (2) For the purposes of this rule, *supplementary report*, in relation to an earlier report provided by an expert witness, includes any report by the expert witness that indicates that he or she has changed his or her opinion on a material matter expressed in the earlier report.
- (3) This rule does not apply to a report prepared by a court-appointed expert.

31.35 Opinion evidence by expert witnesses (cf [Federal Court Rules](#), Order 34A, rule 3)

In any proceedings in which two or more parties call expert witnesses to give opinion evidence about the same issue or similar issues, or indicate to the court an intention to call expert witnesses for that purpose, the court may give any one or more of the following directions—

- (a) a direction that, at trial—
 - (i) the expert witnesses give evidence after all factual evidence relevant to the issue or issues concerned, or such evidence as may be specified by the court, has been adduced, or
 - (ii) the expert witnesses give evidence at any stage of the trial, whether before or after the plaintiff has closed his or her case, or
 - (iii) each party intending to call one or more expert witnesses close that party's case in relation to the issue or issues concerned, subject only to adducing evidence of the expert witnesses later in the trial,
- (b) a direction that, after all factual evidence relevant to the issue, or such evidence as may be specified by the court, has been adduced, each expert witness file an affidavit or statement indicating—

- (i) whether the expert witness adheres to any opinion earlier given, or
 - (ii) whether, in the light of any such evidence, the expert witness wishes to modify any opinion earlier given,
- (c) a direction that the expert witnesses—
- (i) be sworn one immediately after another (so as to be capable of making statements, and being examined and cross-examined, in accordance with paragraphs (d), (e), (f), (g) and (h)), and
 - (ii) when giving evidence, occupy a position in the courtroom (not necessarily the witness box) that is appropriate to the giving of evidence,
- (d) a direction that each expert witness give an oral exposition of his or her opinion, or opinions, on the issue or issues concerned,
- (e) a direction that each expert witness give his or her opinion about the opinion or opinions given by another expert witness,
- (f) a direction that each expert witness be cross-examined in a particular manner or sequence,
- (g) a direction that cross-examination or re-examination of the expert witnesses giving evidence in the circumstances referred to in paragraph (c) be conducted—
- (i) by completing the cross-examination or re-examination of one expert witness before starting the cross-examination or re-examination of another, or
 - (ii) by putting to each expert witness, in turn, each issue relevant to one matter or issue at a time, until the cross-examination or re-examination of all of the expert witnesses is complete,
- (h) a direction that any expert witness giving evidence in the circumstances referred to in paragraph (c) be permitted to ask questions of any other expert witness together with whom he or she is giving evidence as so referred to,
- (i) such other directions as to the giving of evidence in the circumstances referred to in paragraph (c) as the court thinks fit.

31.36 Service of experts' reports in professional negligence claims (cf SCR Part 14C, rules 1 and 6; DCR Part 28, rule 9B)

- (1) Unless the court orders otherwise, a person commencing a professional negligence claim (other than a claim against a legal practitioner) must file and serve, with the statement of claim commencing the professional negligence claim, an expert's report that includes an opinion supporting—
- (a) the breach of duty of care, or contractual obligation, alleged against each person sued for professional negligence, and
 - (b) the general nature and extent of damage alleged (including death, injury or other loss or harm and prognosis, as the case may require), and
 - (c) the causal relationship alleged between such breach of duty or obligation and the damage alleged.
- (2) In the case of a professional negligence claim against a legal practitioner, the court may order the plaintiff to file and serve an expert's report or experts' reports supporting the claim.
- (3) If a party fails to comply with subrule (1) or (2), the court may by order made on the application of a party or of its own motion dismiss the whole or any part of the proceedings, as may be appropriate.
- (4) Without limiting subrule (1) or (2), the court may, on the application of any of the parties, give directions as to the expert evidence to be adduced at trial.
- (5) Directions under subrule (4) may be sought at any directions hearing or case management conference or by notice of motion.

- (6) Unless the court otherwise orders, no party may adduce any expert evidence at trial unless the evidence—
- (a) has been filed and served under subrule (1) or (2), or
 - (b) has been served pursuant to directions given under subrule (4).

Subdivision 4 Parties' single experts

31.37 Selection and engagement

- (1) If an issue for an expert arises in any proceedings, the court may, at any stage of the proceedings, order that an expert be engaged jointly by the parties affected.
- (2) A parties' single expert is to be selected by agreement between the parties affected or, failing agreement, by, or in accordance with the directions of, the court.
- (3) A person may not be engaged as a parties' single expert unless he or she consents to the engagement.
- (4) If any party affected knows that a person is under consideration for engagement as a parties' single expert—
 - (a) the party affected must not, prior to the engagement, communicate with the person for the purpose of eliciting the person's opinion as to the issue or issues concerned, and
 - (b) if the party affected has previously communicated with the person for that purpose, he or she must notify the other parties affected as to the substance of those communications.

31.38 Instructions to parties' single expert

- (1) The parties affected must endeavour to agree on written instructions to be provided to the parties' single expert concerning the issues arising for the expert's opinion and concerning the facts, and assumptions of fact, on which the report is to be based.
- (2) If the parties affected cannot so agree, they must seek directions from the court.

31.39 Parties' single expert may apply to court for directions

- (1) The parties' single expert may apply to the court for directions to assist the expert in the performance of the expert's functions in any respect.
- (2) Any such application must be made by sending a written request for directions to the court, specifying the matter in relation to which directions are sought.
- (3) A parties' single expert who makes such an application must send a copy of the request to the parties affected.

31.40 Parties' single expert's report to be sent to parties

- (1) The parties' single expert must send a signed copy of his or her report to each of the parties affected.
- (2) Each copy must be sent on the same day and must be endorsed with the date on which it is sent.

31.41 Parties may seek clarification of report

- (1) Within 14 days after the parties' single expert's report is sent to the parties affected, and before the report is tendered in evidence, a party affected may, by notice in writing sent to the expert, seek clarification of any aspect of the report.
- (2) Unless the court orders otherwise, a party affected may send no more than one such notice.
- (3) Unless the court orders otherwise, the notice must be in the form of questions, no more than 10 in number.
- (4) The party sending the notice must, on the same day as it is sent to the parties' single expert, send a copy of it to each of the other parties affected.

- (5) Each notice sent under this rule must be endorsed with the date on which it is sent.
- (6) Within 28 days after the notice is sent, the parties' single expert must send a signed copy of his or her response to the notice to each of the parties affected.

31.42 Tender of reports and of answers to questions

- (1) Subject to rule 31.23(3) and unless the court orders otherwise, the parties' single expert's report may be tendered in evidence by any of the parties affected.
- (2) Unless the court orders otherwise, any or all of the parties' single expert's answers in response to a request for clarification under rule 31.41 may be tendered in evidence by any of the parties affected.

31.43 Cross-examination of parties' single expert

Any party affected may cross-examine a parties' single expert, and the expert must attend court for examination or cross-examination if so requested on reasonable notice by a party affected.

31.44 Prohibition of other expert evidence

Except by leave of the court, a party to proceedings may not adduce evidence of any other expert on any issue arising in proceedings if a parties' single expert has been engaged under this Division in relation to that issue.

31.45 Remuneration of parties' single expert

- (1) The remuneration of a parties' single expert is to be fixed by agreement between the parties affected and the expert or, failing agreement, by, or in accordance with the directions of, the court.
- (2) Subject to subrule (3), the parties affected are jointly and severally liable to a parties' single expert for his or her remuneration.
- (3) The court may direct when and by whom a parties' single expert is to be paid.
- (4) Subrules (2) and (3) do not affect the powers of the court as to costs.

Subdivision 5 Court-appointed experts

31.46 Selection and appointment (cf SCR Part 39, rule 1; DCR Part 28A, rule 1; LCR Part 38B, rule 1)

- (1) If an issue for an expert arises in any proceedings the court may, at any stage of the proceedings—
 - (a) appoint an expert to inquire into and report on the issue, and
 - (b) authorise the expert to inquire into and report on any facts relevant to the inquiry, and
 - (c) direct the expert to make a further or supplemental report or inquiry and report, and
 - (d) give such instructions (including instructions concerning any examination, inspection, experiment or test) as the court thinks fit relating to any inquiry or report of the expert or give directions concerning the giving of such instructions.
- (2) The court may appoint as a court-appointed expert a person selected by the parties affected, a person selected by the court or a person selected in a manner directed by the court.
- (3) A person must not be appointed as a court-appointed expert unless he or she consents to the appointment.
- (4) If any party affected knows that a person is under consideration for appointment as a court-appointed expert—
 - (a) the party affected must not, prior to the appointment, communicate with the person for the purpose of eliciting the person's opinion as to the issue or issues concerned, and

- (b) if the party affected has previously communicated with the person for that purpose, he or she must notify the court as to the substance of those communications.

31.47 Instructions to court-appointed expert

The court may give directions as to—

- (a) the issues to be dealt with in a report by a court-appointed expert, and
- (b) the facts, and assumptions of fact, on which the report is to be based,

including a direction that the parties affected must endeavour to agree on the instructions to be provided to the expert.

31.48 Court-appointed expert may apply to court for directions

- (1) A court-appointed expert may apply to the court for directions to assist the expert in the performance of the expert's functions in any respect.
- (2) Any such application must be made by sending a written request for directions to the court, specifying the matter in relation to which directions are sought.
- (3) A court-appointed expert who makes such an application must send a copy of the request to the parties affected.

31.49 Court-appointed expert's report to be sent to registrar (cf SCR Part 39, rule 3; DCR Part 28A, rule 3; LCR Part 38B, rule 3)

- (1) The court-appointed expert must send his or her report to the registrar, and a copy of the report to each party affected.
- (2) Subject to rule 31.23(3) and unless the court orders otherwise, a report that has been received by the registrar is taken to be in evidence in any hearing concerning a matter to which it relates.
- (3) A court-appointed expert who, after sending a report to the registrar, changes his or her opinion on a material matter must forthwith provide the registrar with a supplementary report to that effect.

31.50 Parties may seek clarification of court-appointed expert's report

Any party affected may apply to the court for leave to seek clarification of any aspect of the court-appointed expert's report.

31.51 Cross-examination of court-appointed expert (cf SCR Part 39, rule 4; DCR Part 28A, rule 4; LCR Part 38B, rule 4)

Any party affected may cross-examine a court-appointed expert, and the expert must attend court for examination or cross-examination if so requested on reasonable notice by a party affected.

31.52 Prohibition of other expert evidence (cf SCR Part 39, rule 6; DCR Part 28A, rule 6; LCR Part 38B, rule 6)

Except by leave of the court, a party to proceedings may not adduce evidence of any expert on any issue arising in proceedings if a court-appointed expert has been appointed under this Division in relation to that issue.

31.53 Remuneration of court-appointed expert (cf SCR Part 39, rule 5; DCR Part 28A, rule 5; LCR Part 38B, rule 5)

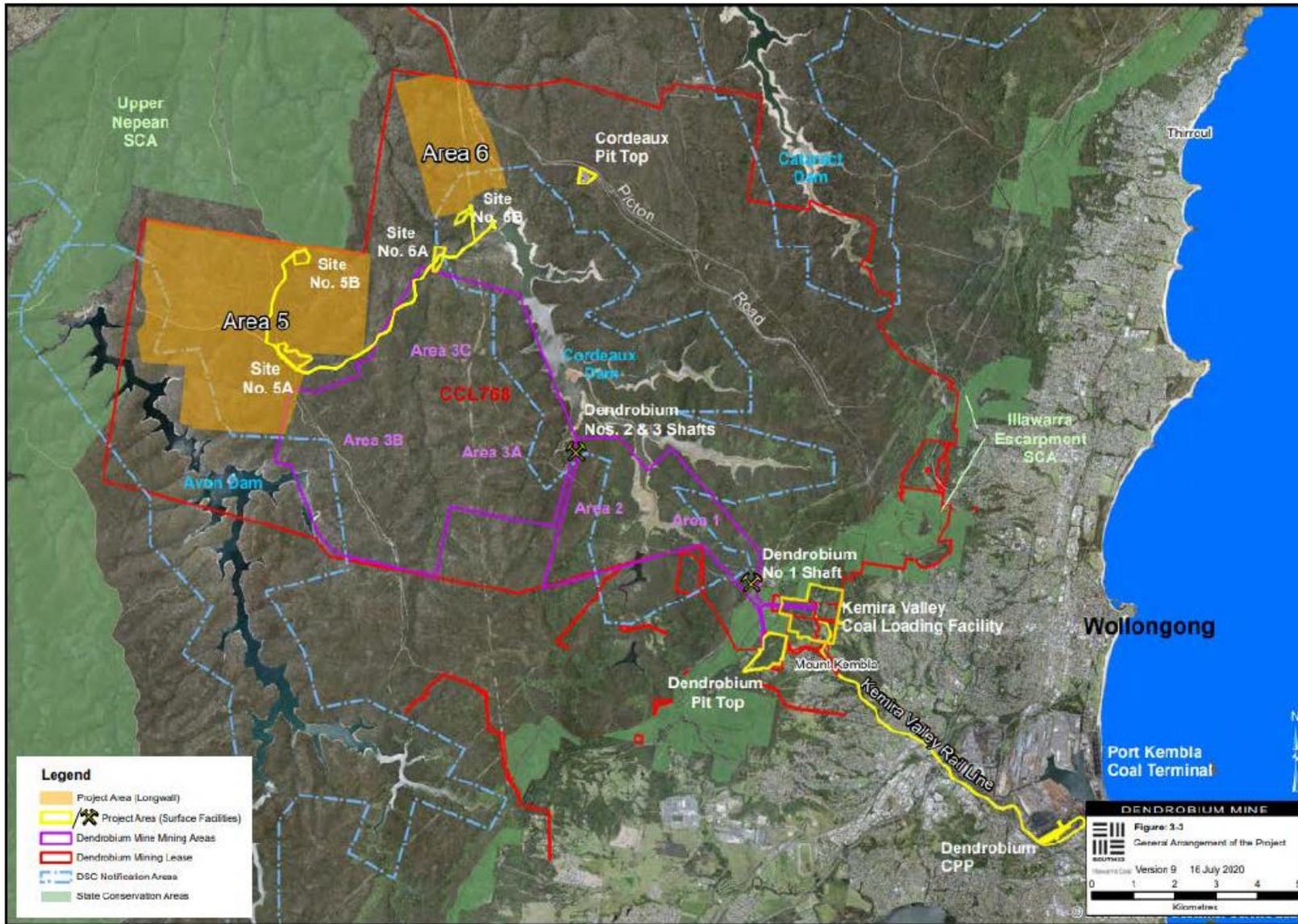
- (1) The remuneration of a court-appointed expert is to be fixed by agreement between the parties affected and the expert or, failing agreement, by, or in accordance with the directions of, the court.
- (2) Subject to subrule (3), the parties affected are jointly and severally liable to a court-appointed witness for his or her remuneration.
- (3) The court may direct when and by whom a court-appointed expert is to be paid.

(4) Subrules (2) and (3) do not affect the powers of the court as to costs.

31.54 Assistance to court by other persons (cf SCR Part 39, rule 7; DCR Part 28A, rule 7; LCR Part 38B, rule 7)

- (1) In any proceedings, the court may obtain the assistance of any person specially qualified to advise on any matter arising in the proceedings and may act on the adviser's opinion.
- (2) Rule 31.53 applies to and in respect of a person referred to in subrule (1) in the same way as it applies to and in respect of a court-appointed witness.
- (3) This rule does not apply to proceedings in the Admiralty List of the Supreme Court or to proceedings that are tried before a jury.

Figure 2 - Local Context & General Arrangement (Source: Amendment Report)



This map shows the spatial extent (Areas 5 & 6) of the Applicant's previous Significant State Development (SSD) application ([Dendrobium Extension Project, SSD 8194](#)), refused by the Independent Planning Commission.