

Appendix 4 Risk matrix: Section 21 (c) and (i) water use Risk Assessment Protocol

No.	1	2	3	4	5	6	7
Phases	Construction & Decommissioning phase	Construction & Decommissioning phase	Construction & Decommissioning phase	Construction & Decommissioning phase	Construction & Decommissioning phase	Operational Phase	Cumulative impacts
Activity	Clearing of vegetation within wetland crossings	Clearing of vegetation within riverine (with riparian and or alluvial systems) crossings	Loss of Species of Special Concern	Spills and leaks from construction vehicles / machinery when working in or near the delineated systems	Erosion and Sedimentation	Creation of hard surfaces	All activities within delineated areas, when combined with present day activities
Aspect	Clearing of valley bottom wetland vegetation within the delineated systems, while Pans/Depression will be avoided	Clearing of within any of the delineated channel	Several plant species within the region are conservation worthy or are protected by the respective Provincial bodies of legislation, but no listed species were observed within any of the systems.	Impact on localised surface water quality	Impact on localised surface water quality and habitat degradation	Additional hard surface areas although limited to manhole structures and any supporting infrastructure	The cumulative impact of the present day roads combined with the proposed project require assessment
Impact	Clearing of wetland vegetation would be limited as present the R381 crosses these systems, while the larger systems south of Rosedene towards Beaufort West will have overhead lines, i.e. spanned and thus avoided). Regardless, both means of crossing these system would thus limit the impact on flow regime through avoidance, thus limiting the potential impact on water quality, habitat and biota	Clearing of any riparian vegetation or disturbance of any bed or banks of alluvial systems would be limited as presently the R381 crosses these systems. This would limit the impact on flow regime through avoidance, thus reducing the potential impact on water quality, habitat and biota	Loss of threatened or protected plant species	Leaks from plant / machinery during the construction phase	Unstable soils will erode and create sedimentation downstream	Unstable soils will erode and create sedimentation downstream	When assessing the impacts, it is unlikely that additional large scale impacts on the aquatic environment would occur, this being based on the fact that once stable / vegetated the buried cable sleeves would not create any additional disturbances to the flow regime and or aquatic habitats observed. This is assuming that the mitigation in the construction and operational phase are adhered to.
Flow Regime	1	1	1	1	1	1	1
Physico & Chemical (Water Quality)	1	1	1	2	2	2	1

Square Kilometre Array fibre optic cable between Beaufort West and Carnarvon.

Appendices

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Habitat (Geomorph + Vegetation)	1	1	1	1	2	2	1
Biota	1	1	3	3	2	1	1
Severity	1	1	1.5	1.75	1.75	1.5	1
Spatial scale	2	1	1	1	1	1	1
Duration	2	2	1	1	1	2	1
Consequence	5	4	3.5	3.75	3.75	4.5	3
Frequency of activity	2	2	1	2	2	2	1
Frequency of impact	3	3	1	2	2	2	1
Legal Issues	5	5	5	5	5	5	5
Detection	1	1	1	1	1	1	1
Likelihood	11	11	8	10	10	10	8
Significance	55	44	28	37.5	37.5	45	24
Risk Rating	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Confidence level	90-100	90-100	100	90-100	90 - 100	90-100	90-100
Control Measures	Where wetland areas aren't spanned with the OHL, then the cables should be tied into the existing bridges. Should this not be an option, and the crossing distance suitable, then directional drilling is recommended. Failing these options, then it is suggested that hand dug trenching occur in these areas (i.e. no plant is allowed to access these areas). Any of the activities, should also be monitored by the appointed EO/ECO on a daily basis, especially during periods of river flow.	Where riverine areas aren't spanned with the OHL, then the cables should be tied into the existing bridges. Should this not be an option, and the crossing distance suitable, then directional drilling is recommended. Any of the activities, should also be monitored by the appointed EO/ECO on a daily basis, especially during periods of river flow. Any points of erosion should be stabilised immediately (sand bags in the short term) using gabions and reno mattress as required.	Search and Rescue should be initiated prior to construction. Construction EMP, Monitoring and Rehabilitation Plan	Construction EMP, Monitoring via EO / ECO and daily inspection of plant. No refuelling and or servicing of plant should occur within the delineated systems.	Construction EMP, Monitoring via EO /ECO with daily inspection of works areas, where any unstable soils occur, these must be protected with temporary stabilisation (sand bags or hay bales dependent on the scale of the operation) until areas become revegetated. If any areas require permanent erosion protection (e.g. gabions or stone pitching) then this must be included into the GA application, however it is recommended that active revegetation of	Monitoring should occur on a monthly basis for 6 months post construction and where any unstable soils occur, these must be protected with temporary stabilisation dependent on the scale of the impact i.e. sand bags - hay bales) until areas become revegetated. If any areas require permanent erosion protection (e.g. gabions or stone	With the combination of the proposed buried and OHL cables, limited to an existing road servitude it is envisaged that the impacts would remain LOW. This is assuming the mitigation listed above are implemented. It is therefore envisaged that the PES & EIS of the systems would remain the same

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	Any points of erosion should be stabilised immediately (sand bags in the short term) using gabions and reno mattress as required. No activities should take place outside of the demarcated servitude, to prevent additional cumulative impacts on these systems	No activities should take place outside of the demarcated servitude, to prevent additional cumulative impacts on these systems			the area be encouraged, i.e. once construction has been completed, the disturbed areas are demarcated as exclusion areas, thus preventing compaction / disturbance of area.	pitching) then this must be include into the GA application	
PES AND EIS OF WATERCOURSE	Wetland PES scores ranged between B & B/C within the road servitude assessed, with the exception of the road crossings the impacts within the greater area are minimal. The EIS was rated as High for the systems, as they provide habitat / refugia for several animal species, and contribute to downstream systems (Fish)	PES scores ranged between B - C within the road servitude assessed, with the exception of the road crossings, the impacts within the greater area are minimal. The EIS was rated as High to Moderate for the systems, as they provide habitat / refugia for several animal species, and contribute to downstream systems (Fish)	Wetland PES = B & B/C Rivers B - C EIS High to Moderate	Wetland PES = B & B/C Rivers B - C EIS High to Moderate	Wetland PES = B & B/C Rivers B - C EIS High to Moderate	Wetland PES = B & B/C Rivers B - C EIS High to Moderate	Wetland PES = B & B/C Rivers B - C EIS High to Moderate