

APPENDIX C: DWS RISK ASSESSMENT MATRICES

RISK MATRIX (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)

Risk to be scored for construction and operational phases of the project. MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

Upgrad	e of existing district r	oads to widening / strengthen current o all of the Wind Relic proje	rossings for some of the road options but no cts	×		Sev	verity																
No	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	Severity	Spatial scale Dura	ation	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Confidence level	Control Measures	Borderline LOW MODERATE Rating Classes	PES AND EIS OF WATERCOURSE
	1 Construction	Uggade of existing district dash to widening at anegthen correct crossings	Disturbance and clearing of vegetation within the bed and banks of unsate courses to access the bridge crossing site to increase within and required. Plant and associated machinery will be used to remove / e.g. Increase cubit associated approach neads, result of within and expression protection and energy approach neads, result of with and energy in vegetation clearing and or asil compaction), and or sail compaction).	Loss of riparian and or instream equatic vegetation fincupils the disturbance, which could result in and or estimatestation. The will also result in be disturbance of equatic blob as well as order habits hagemetiation if any such vegetation is preserve as the activities with could be activities with order that disturbance of equations in the exciting disturbance.	1		2	1	1,25		1	135	2	3	5	1	11	35,75	LOW	90-100	Rehabilities areas where active ension is identified to re- instance nature topography and hydrological conduction. Unclusion within affected aquatic resources, and where it pension interventions to simulate packing of these roots, geneticative such as out a server, and packing of these roots, geneticative such as out a server, and exactly and the server and the server and packing of these roots, geneticative such as out a server, and exactly and the server and packing of these roots and the server and packing of these roots and the server and packing of these roots and packing of the server and		PES = C & D EIS = Moderate to Low
	2 Construction		Localised potential changes to the flow regime, by the impedance created by structures are placed higher than the natural riverbed levels	Surface water flow may be impeded within the natural channels when a structure to placed within the bed of the watercourse during the construction phase. (i.e. any laced structures higher than the current natural rever place. This is especially true when considering that a number of these esting structures were constantled with due consideration of the natural rivebed levels and do already create a small degree of impendence.	2			1	1.25		2	43	2	2	5		10	42,5	LOW	90-100	The final design should take cognisance of typical baselibore and should take cognisance of typical control of the state and should be control of the state value of the state of the state of the state of the state value of the state of the state of the state of the state value of the state of the state of the state of the state value of the state of the state of the state of the state value of the state of the state of the state of the state value of the state of th		PES = C & D EIS = Moderate to Low
3	Construction		Water quality may be affected by various construction activities which lacide all and lexity, says of activities of the second second of or dry cement etc.	During construction various materials, such as sections, speech construction of the section of the construction of the construction functioning of downstream areas. If by dance it is dispersed via surface run-off, or are allowed to permeate into the groundwater.	•	3	·	2	1,76		1	3.75	t	1	5	ſ		30	LOW	99-100	Chemicals used for construction must be stored safely on alls and sinuranced by hunds. I. Chemical atorgie contains even the sinurance of the sinura sinura and detected even the sinurance of the sinurance of the sinurance of the sinurance of the sinurance of the sinurance All terring and contentiation of where sources during construction must be in place in case of spillages on and aufoce and wave courses. All terring and contentiation of the sinurance of the sinurance areas where courd by the minimed, and source areas where courd by the minimed, and subtract by bunds. Course and sections of the sinurance minimed through the effective stabilisation (galation and the construction) and the recessive and any statuted and the sinurance of the sinurance of the sinurance of the sin	đ	PES = C & D EIS = Moderate to Low
4	Construction		Destruction of habitat that may contain listed and / or protected aqualic blots critical blothvenshy / ecological support area	Los of any species of special occess and habitat continuity / shabat fragmentations in a result works within the bed or banks	2	2	2	1	1,75	2	1	475	2	2	5	1	10	47.5	LOW	90-100	• The field design should take septement of typical baseflows and exolute for create any impedances of flows "basefund new review care many memory of the set should be maintained, thus allowing for continuity within the reviewed, it, not create any obstruction implicit any flausa flow moving up or downstream. "Above construction has been completed, all disturbed areas do care should be also completed and be also be construction. "Which movement within the watercourse should be limited the works areas to provent under any compaction of solit design to prevent bank instability and administration.		PES = C & D EIS = Moderate to Low

5	Dperations	Operational activit verhicles using the b the only and operating and repair and mainten infrastructure (out erosion probes manageme	ridge crossings, with activities within the ng the occasional ance of the crossing erts, guard rails and ion/stormwater	h Limited disturbance of the beds and banks while maintenance and repairs are conducted, but would be limited to the existing crossing footprinted which	1	1	1	4	1	1	1	3	t	1	6	1	8	24	LOW	Rehabilitate areas where active erosion is identified to re-instate natura topography and Monitor for erosion and inciden within affects aquast erospectation must be installed which can incide the packing of iso strock, genetaries such as a sol savery; and implement alive vegetation control pogram & enure excludingtion agriculture within areas where alive vegetation was identified	PES = C & D ES = Moderate to Low
6	Operations	Stormwater nano ph	f in the operations	Increased velocity of surface water flow generated by hardened works and flowing harges encounter management increase the potential for ensuin and then sedimentation downstream.		2	2	ſ	1,5	1	1	35	1	1	5	t	8	28	LOW	A stormwater management plan must be developed in the preconstruction phase, detailing the atomwater structures and management interviewing minima being the structures management interviewing minima being and the natural systems. Elective statismate in a structure include effective statismate (applicable and the re- weights) and the structure structure and the mathematic structure and the structure structure mathematic structure and the structure mathematic structure and the structure mathematic structure and the structure of an annual basis and manifatived / improved as negatived during the structure and token and exceeding in the structure of water and would then change in nature and attributes, i.e. atomwater detention pond.	PES = C & D ES = Moderate to Low

SUPPO	TING INFRASTRUCT	URE OF THE WIND FARMS (TURBINES,	INOR WATERCOURSE CROSSINGS ONLY AS SUBSTATIONS AND LAYDOWN AREAS HAVE BUFFER HAVE ALSO BEEN AVOIDED BY THE			Se	verity															
No.	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Confidence level Control Measures	Borderline LOW MODERATE Rating Classes	PES AND EIS OF WATERCOURSE
	Construction	NEW MITEINAL ACCESS ROADS AND UNDERGROUND CABLES - MINOR WITEINCURSE CROSSINGS ONLY AS SUPPORTING WITRASTRUCTURE OF THE WITRASTRUCTURE OF THE SUBSTATIONS AND LATOOW WATERCOURSES, ALL PASS AND WEILANDS INCL. OF AND WEILAN	Disturbance and clearing of vegetation within the bed and banks of waterourses to access the bridge crossing site to install culverts as required. Plant and associated machinery will be used to the crossing holge infrastructure e.g. culvert, shape approach noads, build wing walls and dissipation structures, which will result	Loss of riparian and or instream aquatic vegetation through the distubstance, which could result in and or sedimentation. This will also result in the disturbance of aquatic bloba as well as relate habitat fragmentation if any such vegetation is present.	'	2	2	2	1,75	1	2	478	2	3	5	1	11	52,25	LOW	Rehabiliste areas where active ension is identified to re- instate natural (soggraphy and hydrological conditions; Monito for encion and brainish informations to annutate second and the installed which can include the receptation must be installed which can include the memory and or loss ord, explained such as a soli savers; and implement all encycles active species while exabilities of indigenous packets while areas where allow registion was identified		PES = C & D EIS = Moderate to Low
	2 Construction		regime, by the impedance created by the culverts when structures are placed	Surface water flow may be imposed within the natural channels when a surface is placed within the bal of the watercome during the construction black, i.e. any raised structures higher than the current natural river levels may create impedance while construction takes place.	2	•		2	1,5	1	2	45	2	2	5	t	10	45	LOW	-The final design should take cognisance of typical baseflows and should not create any impedance of flows Maturi inter levels upstheam and downstream of the should be approximately and the should be limit toom moving up or downstream. -Weble novement within the valancourse aloud be limit to the works are to prevert unde any comparison of only the works are to prevert unde any comparison of only designs to prevent bank instability and sedimentation.	d	PES = C & D IIS = Moderate to Low

													_										
3	Construction	vari incli con	ater quality may be affected by from controller activities witch more activities witch activities and the seconcrete dry cement etc.	During contraction serious materials, such as seriments diesel, dis and center/forcente, coald pose a threat to the continued functioning of downleteam area. If y shane it is dispersed via surface run-of, or are allowed to permeate into the groundwater.		z		2	1,5			м	t					28	LOW	90-100	-Chemicals used for construction must be stored safely on more to engaging regulation of water sources during careful to engaging the photon of water sources during careful and contamination of water sources during careful and sources and the source of the source of the careful and the sources and the source of the careful and the sources and the source of the research water sources. And the source of the careful and the sources and the source of the careful and the sources and the sources of the minimised through the effective stabilisation (gabines and through the effective stabilisation (gabines and the construction events must be beyond the prove the effective stabilisation (gabines and the construction compared and the events and the sources and the the construction compared and the events and the sources and the sources and the sources and the sources and the construction compared and the sources		D EIS = Moderate to Low
4	Construction	liste (fau	struction of habitat that may contain led and / or protected aquatic bida us biodivenity / ecological support as	Loss of any species of special concern and habitat continuity / habitat fragmentation created by the works within the bed or banks	. 1	t		3	1,5	2	1	45	2	2	5	1	10	45	LOW	90-100	•The final design should take cognisance of typical baseflows and should not create any impedance of flows •Abstant after integrations and showing for continuity within the moving go of owner thermal should be appreciated on the should be endorsed by an owner thermal should be appreciated by the •Once construction has been completed, all disturbed areas should be monitored with regard reception which should could be continued with regard reception which should only occur if faults are not stable within 6 months post construction. •Vehick movement within the watercourse should be limited to the works area to prevent under any construction of a should be integrated to the should be limited to the surfs area to prevent under any construction.		D EIS – Moderate to Low
5	Operations	veh the v rep infi	Operational activities will be limited to hickes using the bridge crossings, with well-coverse being the occessional pair and maintenance of the crossing frastructure (culvest, guard raits and erosion protection/stormwater management features).	maintenance and repairs are conducted, but would be limited to the existing crossing footprinted which	1	1	1	1	1	1	1	3	1	1	5	1	8	24	LOW	90-100	Rehabilitate areas where active ension is identified to re-instate natural topography and Monitor for mybiological conditions; Monitor for mybiological conditions; recognition must be installed with can include the packing of loss cock generations are include and a packing of loss cock generations and a server; and implement allow vegetation control grogram & ensure estabilishment of longtomous generation was identified	PES = C & D E	D EIS = Moderate to Low
6	Operations	5	Stormwater runoff in the operations phase	Increased velocity of surface water flows generated by hardened surfaces and through improper stomwater management increase the potential for erosion and then sedimentation downstream.	2	2	2	1	1,75	1	1	335		t	5	1		30	LOW	90-100	A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater siructures and management interventions that must be installed to manage the increase of surface water flows directly into any native scales. The file vision storement is the store that any store store the store of the storemeter of management must be inspected on an annual basis and markined. I imported a required during elementation is structurer must be inspected on an annual basis and discharged or direction of basis and the store of the storemeter of the store of the storemeter of elementation has become evident in the operational phase. No rundi may be discharged or direction for the man, as these are not blenart of excessive / regular volumes of vale and would then change in nature and attributes, i.e. stormwater detention pond.		D EIS = Moderate to Low

		ADS AND UNDERGROUND CABLES - WIT IS INCL OF BUFFER HAVE ALSO BEEN AV	HIN 500m OF A WETLAND BOUNDARY. ALL OIDED BY THE PROPOSED LAYOUTS.			Ser	erity																	
No.	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Confidence level	Control Measures	Borderline LOW MODERATE Rating Classes	PES AND EIS OF WATERCOURSE	

10	onstruction	NEW INTERNAL ACCESS ROADS AND UNCERSIONUMO WITLAND BOUNDARY. ALL PARS AND WETLANDS INCL AVOIDED BY THE PROPOSED AVOIDED BY THE PROPOSED AVOIDED BY THE PROPOSED AVOIDED BY THE PROPOSED AVOIDED BY THE PROPOSED and Valley Bottom systems such have been avoided	what in the bed and barns of	Loss of riparian and or instream aquatic vegetation brough the diatutance, which could result in unstable sols that has the potential to create endout disturbance of aquate blobs as well as create habita fragmentation if any such vegetation is present.	1	2	2	2	1,75	1	2	4,75	2	3	5	1	11	52,25	LOW	96-160	Rehabilitate areas where solve encours is identified to re- instate natural topography and hydrological conditions; Monitor for encours and incision within affected aquatic rescurces, and where it penasis interventions to simulate packing of two solves, and where it penasis interventions to a simulate activity of two solves of the solves and intervention of the solves of the solves of the solves of the packing of two solves of penasis of the solves of the intervention of the solves of the solves of the intervention of the solves of the solves of the intervention of the solves of the intervention of the solves of the intervention of the solves of the monitor of the solves of the intervention of intervention of interventio	PES = C & D EIS = Moder Low
2 C	onstruction		coordined potential changes to be from regime, by the impodutions created by the culverts when attructures are placed higher than the natural riverbed levels	Surface water flow may be impeded within the natural channels when a structure is placed within the bed of rated structures higher than the current natural river levels may create impedance while construction takes place.	2	1		2	1,5	1	2	45	2	2	5	1	10	45	LOW	90-100	•The final design should take occysisence of typical baseflows and should not create any impedance of lows *Natural rivel revelue upsteam and downstream of the site should be maintained, thus allowing for contrally within the from mority up or downstream. In thinking any fauna *Vehicle movement within the watercome should be limited to the works area to prevent undue any compaction of acid deal and bank reans protection should be included in the designs to prevent bank instability and sedimentation.	PIS = C & D EIS = Moder Low
3	Construction		Water quality may be affected by various construction activities which include al and fuel splits, split of construction chemicals such as concrete or dry cement etc.	During construction various materials, such as sediments, diesel, ofs and cement/concrete, could pore a threat to the continued functioning of surface run-off, or are allowed to permeate into the groundwater.	1	2		2	1.5		1	35	1	ı	5	,		28	LOW	98-100	Chemicals used for construction must be stored safely on site and surrounded by bunds. Chemical storage containers early, any imported so that any basis are detected early. Litting and containingtion of weak sources during construction must be prevented by effective construction construction must be prevented by effective construction in and surfaces and water course. We stocking individual take place within a water course, whill adopties must be provented from erosion, streed on flat by bunds. "Economical section of the minimide, and the surrounded "biologies must be located arows from fiver channels. "Economical section of the environment on why disturbed minimized intrody the effective sublination (galations and investmants)." "The construction coviers must be leving the propose buffins aloun in Figure 6 as shown in the Aguate Assessment Allached	PES = C & D EIS = Moder Low
4	Construction	-	Dedruction of habital that may contain listed and / or protected aquatic bolds (furma and floring in fragmentation of critical bodivensity / ecological support ance	Loss of any species of special concern and habitat continuity / habitat fragmentation created by the works within the bed of banks	. 1	۹.		3	1,5	2	1	45	2	2	5	,	10	45	LOW	90-100	The final design should take contracts of typical baseflows and should not create any impedance of finas **batani five levels optimeram and downtimeram of the tile should be maintained, thus allowing for continuity within the moving or of downtimera. Control mining any finan Strong *One construction has been completed, all disturbed areas should be monitoring with finanged regression which should bound be providing unsable sails. Seeding should contraction, the preventing unsable sails. Seeding should construction and the should be motion for any whole movement within the watercourse should be limited to be works areas to prevent under any construction of soils existing the prevent should be limited to the designs to prevent bank insability and addimentation.	PES = C & D EIS = Meder
5	Operations		Questional adultes will be limited to welcate-using the bridge crossings, will be only ambiguited adultes within the waterourse being the occasional regain and maintenance of the crossing instantuutice (curve), guard rates management features).	Limited disturbance of the beds and banks while maintenance and repairs are conducted, but would be limited to the existing crossing footprinted which	1			1	1	1	1		1	1	5	1		24	LOW	90-100	Rehabilitate areas where active erosion is identified to re-instate natural loggraphy and material loggraphy and Montro for erosion and incident within affected agustic reception must be installed which can include the packing of loss rots, generating such as a service and the service of the service of the service and establishment of indigenous species within areas where allen vegetation was identified	PES = C & D EIS = Meder Low

6 Operations		Stormwater runoff in the operations phase	Increased velocity of surface water flows generated by hardened surfaces and through improper stormwater management increase the potential for erasion and then sedimentation downstream.	2	2			1,75	1	1	375	1	1	5	T		30	LOW	90-100	A stormwater management plan must be developed in the procorreluction phase, detailing the stormwater structure manage the increase of surface water flows directly inclu- maning the increase of surface water flows directly inclu- matice and the structure management must include effective stabilisation (galories and Reno Matthe Systems). Effective stormwater management must adjust a systems. Effective stormwater management must manage the structure must be inspected on an amount basis and management that be inspected on a manage based on an antibater of the stormwater / energy dissipation structures must be inspected on a stormwater based on the storm existence of the stormwater / adjusted in the storm existence in the operational phase adjusted has been existence of regular volumes of water these are not blemart of excessive / regular volumes of water adjusted in the storm existence in the operational phase adjusted biotecharge in nature and attitutes, i.e. dormwater detertion pool.		PES = C & D EIS = Moderate to Low
	BLADE LAYDOWNS WITHIN SOOM OF A WETLAN WE BEEN AVIOLOED INCL OF BUFFER THEREFORE	D BOUNDARY - ALTHOUGH ALL PARS AND WETLAND NO DIRECT IMPACTS	s		Ser	verity																
No. Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Confidence leve	f Control Measures	Borderline LOW MODERATE Rating Classes	PES AND EIS OF WATERCOURSE
1 Construction	Turbines, hurdistands and ingrown areas only within 500m of welfand boundary, but not within any verticed aces or the associated buffers	Disturbance and clearing of vegetation within 500m of a welfand boundary	All welfands (gans and valley bottom areas) have been avcided by the proposed layouts thus no direct disturbance of any vegetation or soils associated with these systems are anticipated			·	1	,	1	,		,		5	1		24	LOW	90-100	Approval of the current layout is provided in which wetland areas will be avoided		PES = C & D EIS = Moderate to Low
2 Construction		Water quality may be affected by various construction activities which include oil and use guilts, spill of radiade oil and use guilts, spill of activities of the second second of or dry cement etc.	All wellands (pans and valley bottom areas) have been avcided by the proposed layouts thus no direct distuttuince of trace systems are articipated		Ţ		2	125	1	٢	3,29	1	1	5	1		26	LOW	90-100	Chemicals used for construction must be stored safely on alle and surranded by burdt. Chemical alonge oralinary environment of the store of the store of the store of the environment of the store of the store of the store of the store of the store of the store of the store of the difference of difference		PES = C & D EIS = Moderate to Low
3 Construction		Destruction of habitat that may contain listed and / or protected aquatic bida (tana and flora) or fragmentation of critical biodivensity / ecclogical support area	Loss of my species of special occent and habits contently. It haves for paratulations and by the sector concerner, wetland (apps and nafler) pattern in reals have been avoided by the proposed layouts thus no direct disturbance of any operation or soils accounted with these systems are anticipated	1				1		1	3	1	1	5		8	24	LOW	99-100	•The final design should take cognisance of typical baseflows and should not create any impedance of flows + shourd new levels upstream and downstream of the site interfeed. I. and create any solution limiting any flow and for moving up or downstream. •Once construction have any solution limiting any flow and for moving up or downstream. •Once construction have nonpolecting. (all studied areas should be monitored with regard newspatial in which should should be monitored with regard newspatial in the should be construction. Should be initial to construction, the new call all should be initial to week and the mercanic pretection should be initial the week and shark recompretencies not be initial to deal and have recompretencies not be initial to design to prevent bank instability and sedimentation.	,	PES = C & D EIS = Moderate to Low

4 Construction	Placement of elevate structures	Localised potential changes to the flow regime, by the impedance created when structures are placed higher than the natural levels	1		۰.	1	1	1			1	5	1	8	24	LOW	90-100	-The final design should take cognisance of typical baselows and should not create any impedance of flows + + + + + + + + + + + + + + + + + + +	
5 Operations	Stomwaler ruroff in the operations phase due to placement of hard suffaces	Increased velocity of surface water flows generated by hard-oned surface and through improper stormwater management increase the postnitid for existing and then sedimentation downstream.	1	1		1	1	1	3	1	1	6	1	8	24	LOW	90-100	A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to any natural systems. Effective stormwater management must include effective stoructures must be inspected on an annual basis and maintained / improved as nequired during this he operational place, appendity where any endois or an annual basis and maintained / improved as nequired during this he operational concession / england volumes of water and would then change in nature and attributes, i.e. adornwater detention pool.	PEs + C & D ES + Moderate to Low