

**APPENDIX 9/4  
RISK ASSESSMENT**

**Appendix D - Table A Risk Assessment Summary**

Hazard	Source	Pathway	Receptor	Receptor Sensitivity	Magnitude of Impact	Potential Significance of Effect	Embedded Mitigation	Likelihood of Occurrence	Residual Risk after Mitigation
Plant and vehicle fuels and lubricants	Hydrocarbons & additives	Spillage of liquids at surface, and infiltration to groundwater	GW; Padarn Tuff Formation	Medium	Medium	Moderate	Best practice in quarrying activities and conforming to environmental standards reduces likelihood of occurrence, e.g., banded fuel / oil stores; regular plant maintenance; hardstanding maintenance areas	Very Unlikely	None
			GW; Llanberis Slate Formation	Low	Very Low	Negligible	Best practice in quarrying activities and conforming to environmental standards reduces likelihood of occurrence, e.g., banded fuel / oil stores; regular plant maintenance; hardstanding maintenance areas	Very Unlikely	None
			SW; Gwaen Gynfi Heathland	Very High	High	Major	Best practice in quarrying activities and conforming to environmental standards reduces likelihood of occurrence, e.g., banded fuel / oil stores; regular plant maintenance; hardstanding maintenance areas	Very Unlikely	Very Low
			SW; Galedffrwd Watercourse	Low	Low	Negligible	Best practice in quarrying activities and conforming to environmental standards reduces likelihood of occurrence, e.g., banded fuel / oil stores; regular plant maintenance; hardstanding maintenance areas	Very Unlikely	None
			GW; Superficial Deposits	Low	Very Low	Negligible	Best practice in quarrying activities and conforming to environmental standards reduces likelihood of occurrence, e.g., banded fuel / oil stores; regular plant maintenance; hardstanding maintenance areas	Very Unlikely	None
Slate Reject tipping's	Flushing of fines / oxides during rainfall events	Surface runoff & infiltration to groundwater	SW; Afon Ogwen (Lower)	High	Very Low	Minor	Historic tipping's have been established for many years (decades) with no historic issues. New tipping's are contained within quarry void and all runoff infiltrated to ground or directed to settlement lagoons. Placement of tipping's encourage groundwater infiltration to percolate to old quarry void water body providing a very high water storage capacity and dilution / settlement factor	Very Unlikely	None
			SW; Galedffrwd Watercourse	Low	Very Low	Negligible	Historic tipping's have been established for many years (decades) with no historic issues. New tipping's are contained within quarry void and all runoff infiltrated to ground or directed to settlement lagoons. Placement of tipping's encourage groundwater infiltration to percolate to old quarry void water body providing a very high water storage capacity and dilution / settlement factor	Very Unlikely	None

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Slate Reject tipping's	Flushing of fines / oxides during rainfall events	Surface runoff & infiltration to groundwater	GW; Bronllwyd Grit Formation	Medium	Very Low	Negligible	Historic tipping's have been established for many years (decades) with no historic issues. New tipping's are contained within quarry void and all runoff infiltrated to ground or directed to settlement lagoons. Placement of tipping's encourage groundwater infiltration to percolate to old quarry void water body providing a very high water storage capacity and dilution / settlement factor	Very Unlikely	None
			GW; Llanberis Slate Formation	Low	Very Low	Negligible	Historic tipping's have been established for many years (decades) with no historic issues. New tipping's are contained within quarry void and all runoff infiltrated to ground or directed to settlement lagoons. Placement of tipping's encourage groundwater infiltration to percolate to old quarry void water body providing a very high water storage capacity and dilution / settlement factor	Very Unlikely	None
			GW; Padarn Tuff Formation	Medium	Very Low	Negligible	Historic tipping's have been established for many years (decades) with no historic issues. New tipping's are contained within quarry void and all runoff infiltrated to ground or directed to settlement lagoons. Placement of tipping's encourage groundwater infiltration to percolate to old quarry void water body providing a very high water storage capacity and dilution / settlement factor	Very Unlikely	None
Discharge of polluted water / increase in water discharge	Quarry runoff / trade effluent / sewage effluent	Direct discharge to surface water	SW; Afon Ogwen (Lower)	High	High	Moderate	Surface runoff is captured by main quarry void or settlement lagoons before entering the old quarry void water body. Sewage effluent is treated via a package treatment plant that is regularly maintained and serviced before discharging to old quarry void water body Discharge from site is from the old quarry void water body which provides a very high water storage capacity and dilution / settlement factor	Unlikely	Very Low
Dewatering	Shallow and deep groundwater / surface water runoff	Cone of depression/ intercept of groundwater throughflow / Fracture networks / bedding planes/ geological faults/ drainage channels	SW; Afon Ogwen (Lower)	High	Very Low	Minor	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested	Very Unlikely	None
			SW; Gwaen Gynfi Heathland	Very High	High	Major	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested.	Unlikely	Low

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Dewatering	Shallow and deep groundwater / surface water runoff	Cone of depression/ intercept of groundwater throughflow / Fracture networks / bedding planes/ geological faults/ drainage channels					Gwaen Gynfi Heathland is considered to be surface water dependent and disparate from the groundwater system. Interceptor and recharge leat for the extension area will maintain water balance to the heathland during the quarry extension phase		
			SW; Galedffrwd Watercourse	Low	Low	Negligible	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested. Interceptor and recharge leat for the extension area will maintain water balance to the heathland during the quarry extension phase	Unlikely	None
			GW; Superficial Deposits	Low	Low	Negligible	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested. Groundwater component of the superficial deposits in the extension is limited.	Likely	Very Low
			GW; Bronllwyd Grit Formation	Medium	Very Low	Negligible	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested	Very Unlikely	None
			GW; Padarn Tuff Formation	Medium	Very Low	Negligible	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested	Very Unlikely	None
			GW; Llanberis Slate Formation	Low	Very Low	Negligible	Current quarry void is located within slates of Llanberis Formation having very low permeability and has been below the elevation of the watercourse for several years. Quarry activity only has minor component of groundwater dewatering indicating very limited extent for a dewatering cone of depression. Impacts, if any, attributed to the quarry void would have already manifested	Very Unlikely	None

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Hazard	Source	Pathway	Receptor	Receptor Sensitivity	Magnitude of Impact	Potential Significance of Effect	Embedded Mitigation	Likelihood of Occurrence	Residual Risk after Mitigation
Soil Movement	Flushing of soils during rainfall events.	Overland and flushing of drainage channels	SW; Gwaen Gynfi Heathland	Very High	High	Major	Overburden stripping of extension area will be carried out according to best practice and giving consideration to minimising soil mobilisation. The interceptor and recharge leat will act as a buffer for soil mobilisation. The leat has a management plan for keeping free from silts. De-silting of leat will be undertaken in a manner as to avoid the off-site mobilisation of the silts.	Unlikely	Low
			SW; Galedffrwd Watercourse	Low	Low	Negligible	Overburden stripping of extension area will be carried out according to best practice and giving consideration to minimising soil mobilisation. The interceptor and recharge leat will act as a buffer for soil mobilisation. The leat has a management plan for keeping free from silts. De-silting of leat will be undertaken in a manner as to avoid the off-site mobilisation of the silts.	Very Unlikely	None