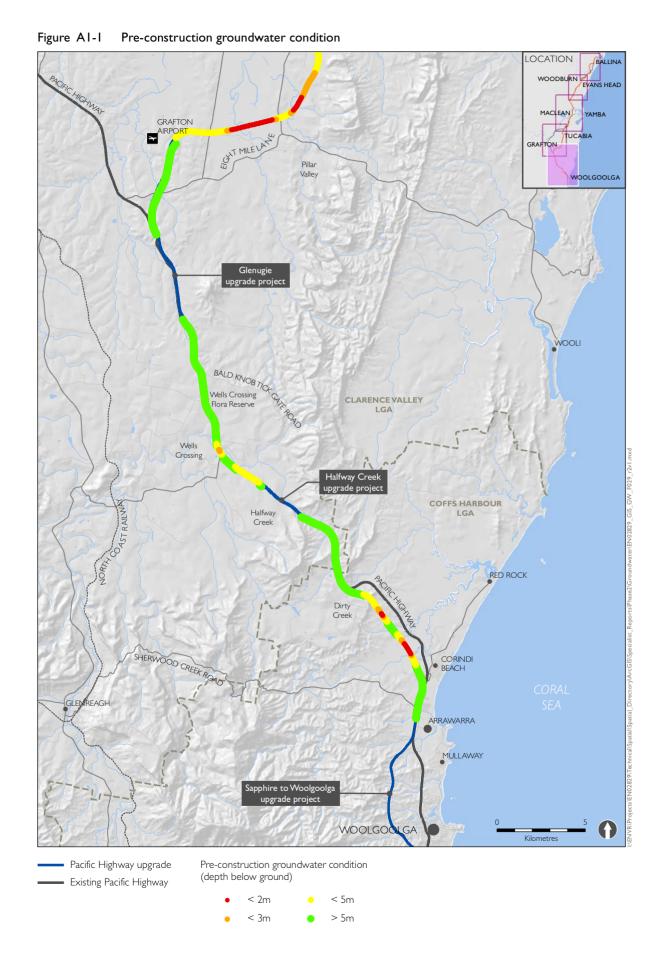
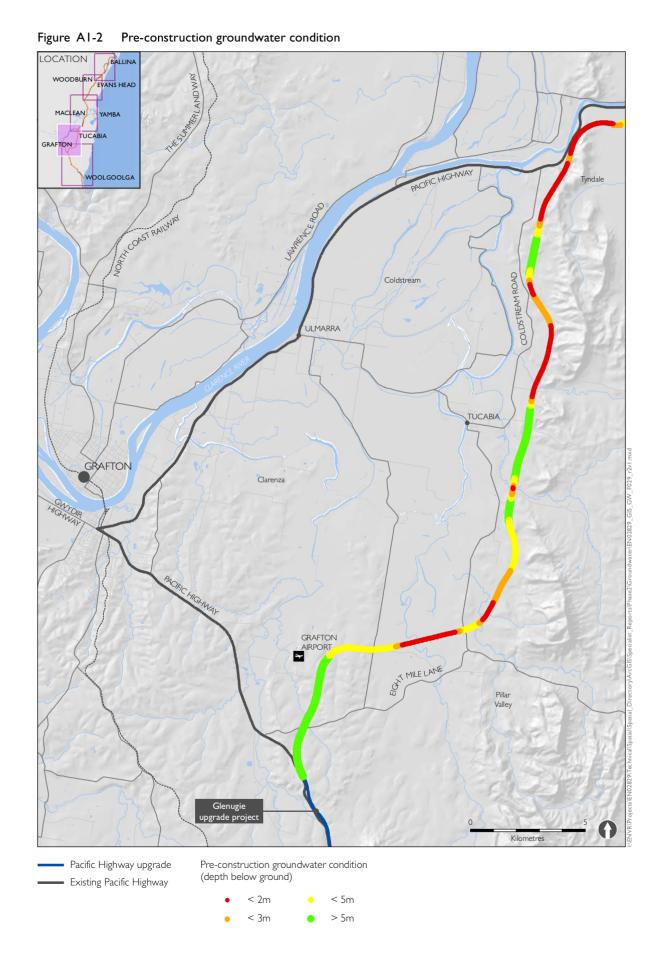
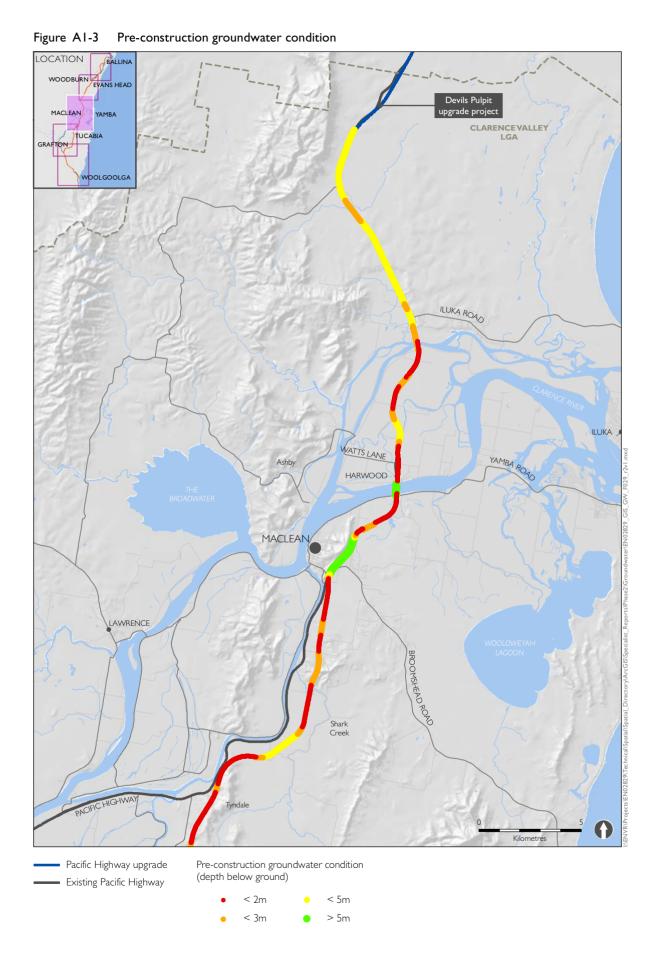
Appendix A Additional maps for the project







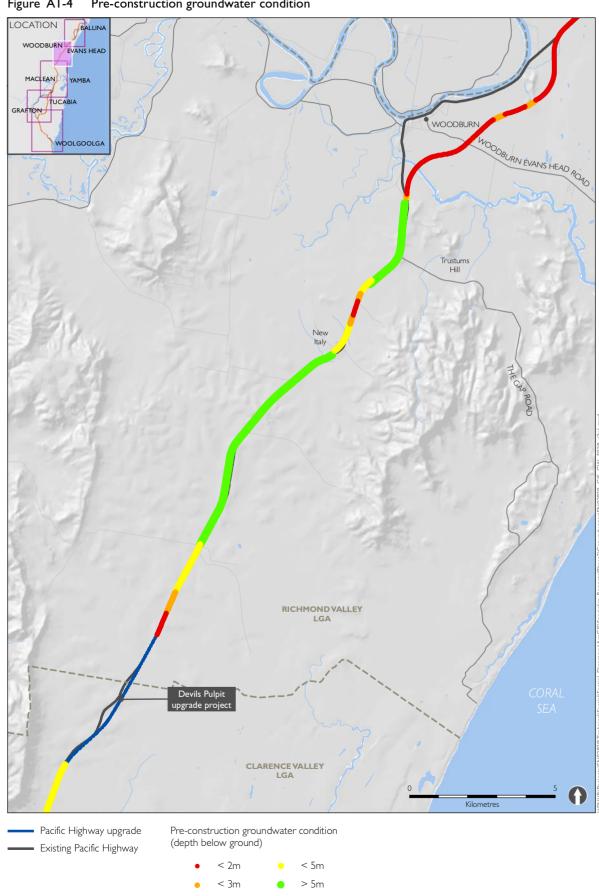
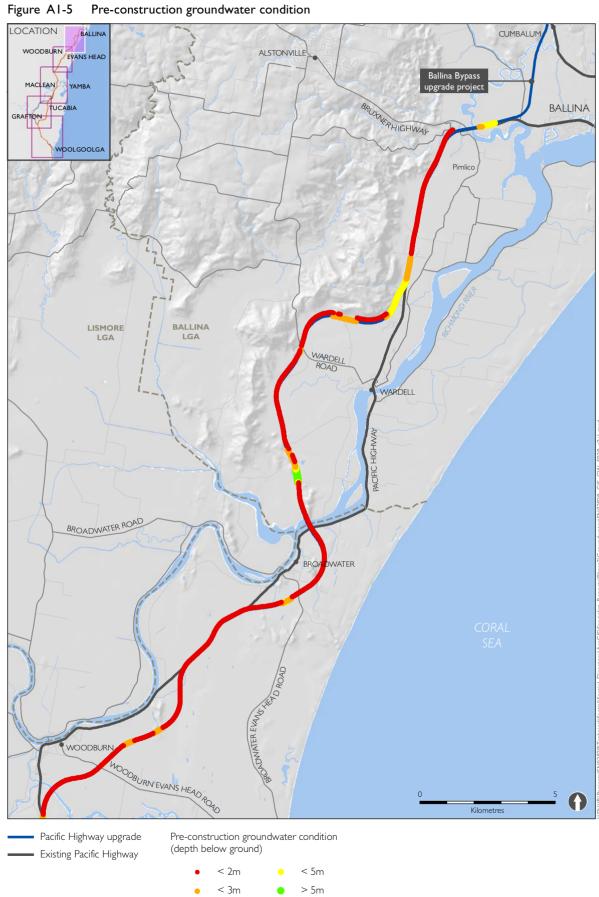


Figure AI-4 Pre-construction groundwater condition



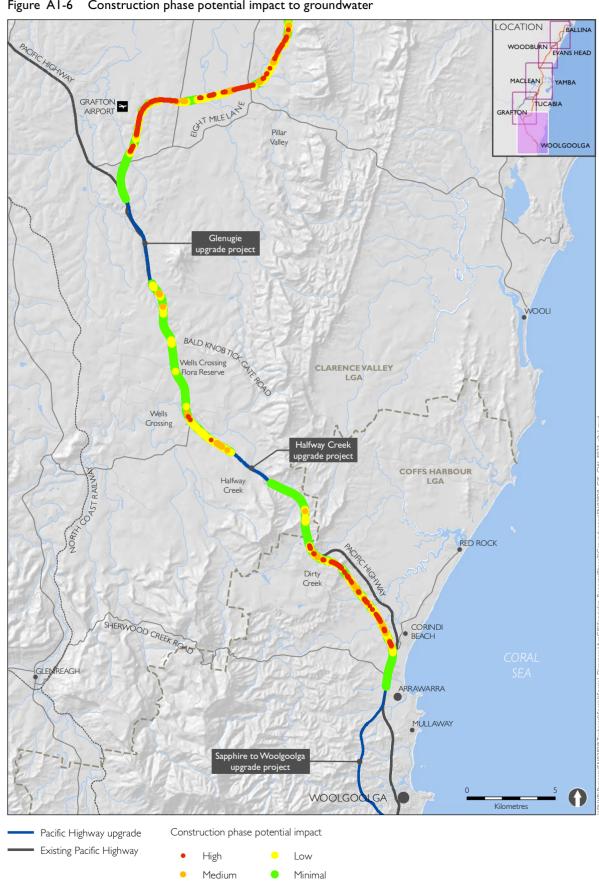
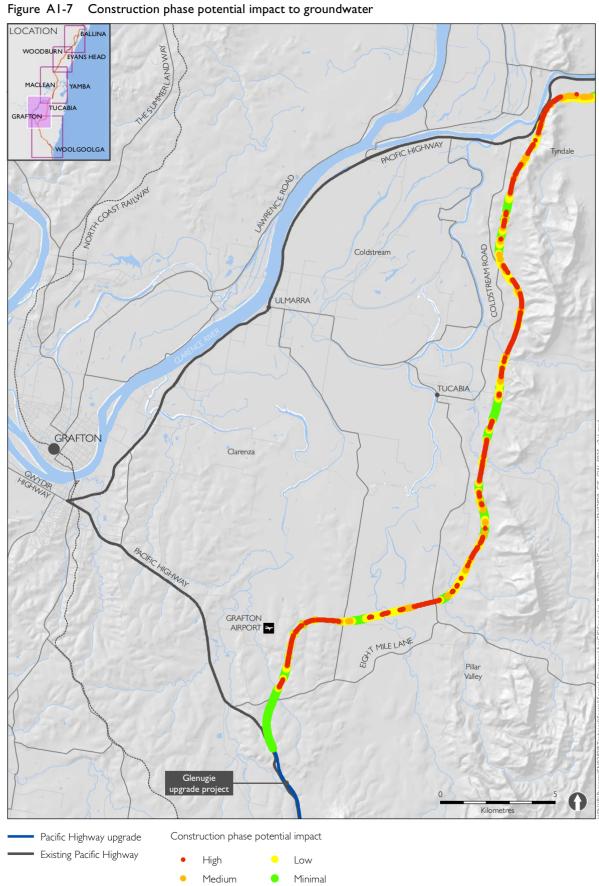


Figure A1-6 Construction phase potential impact to groundwater



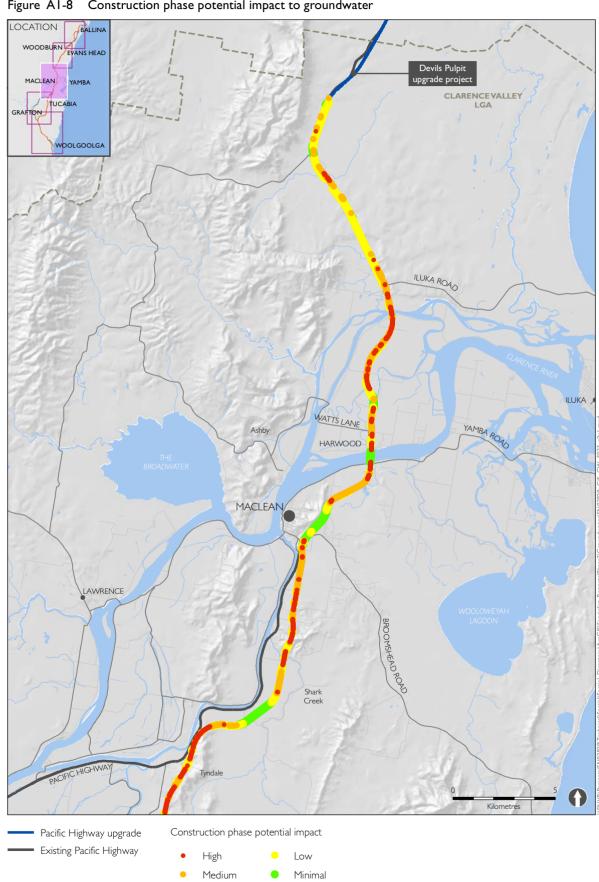


Figure A1-8 Construction phase potential impact to groundwater

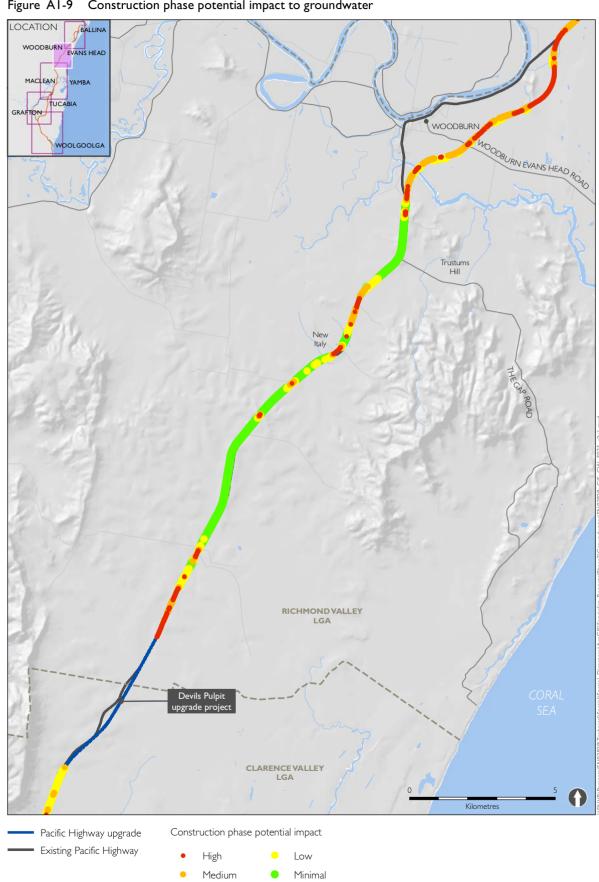


Figure A1-9 Construction phase potential impact to groundwater

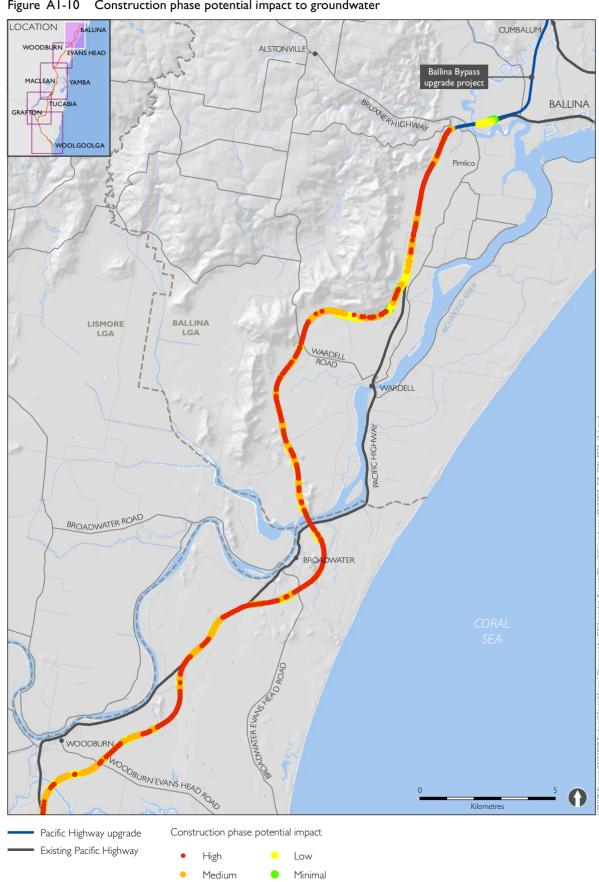


Figure A1-10 Construction phase potential impact to groundwater

AI-II Construction phase potential impact to targeted environmental receptors BALLINA LOCATION WOODBURN EVANS HEAD YURAYGIR STATE ONSERVATION AREA Halfway Creek NEW PORD PORD upgrade project WOOLGOOLGA Halfway NEWFOUNDLAND STATE FOREST YURAYGIR NATIONAL PARK Interchange at Range Roa **CLARENCE VALLEY** LGA RANGEROAD COFFS HARBOUR High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between 1 and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface D CREEK ROAD Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments WEDDING BELLS STATE FOREST ARRAWARRA Disturbed terrain No known occurrence VATURE RESERVE Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Threatened ecological communities Nationally Important Medium

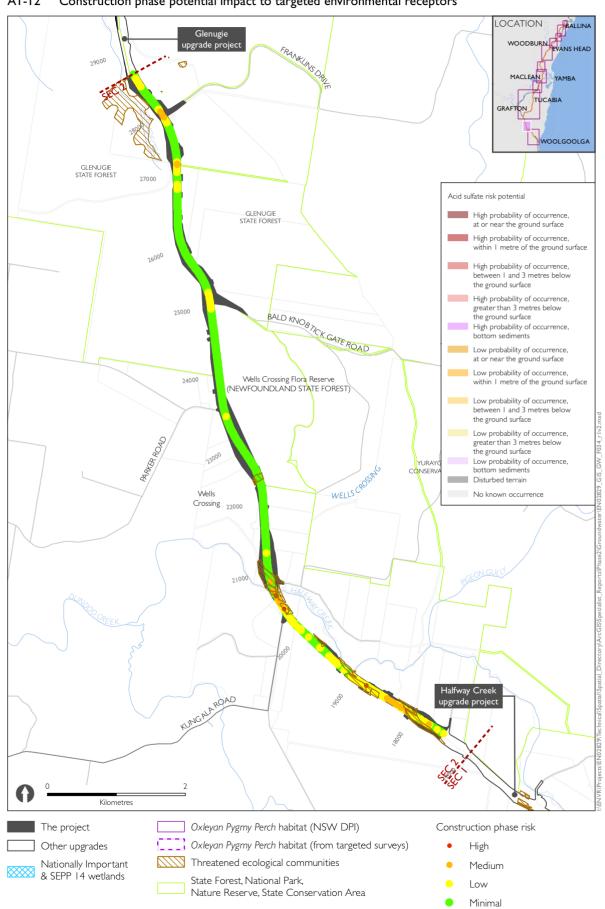
State Forest, National Park,

Nature Reserve, State Conservation Area

Low

Minimal

AI-12 Construction phase potential impact to targeted environmental receptors



AI-13 Construction phase potential impact to targeted environmental receptors LOCATION WOODBURN EVANS HEAD Woodford WOOLGOOLGA Interchange at Tyndale Acid sulfate risk potential High probability of occurrence, at or near the ground surface 233 High probability of occurrence, within I metre of the ground surface PINE BRUSH STATE FOREST High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, SOMERVALE ROAD OSTREAM ROAD bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface BOSTOCK ROAD Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain CANDOLE STATE FOREST No known occurrence Clarenza GRAFTON AIRPORT Pillar BOM BOM STATE FOREST WOOLI RO DIVINES STATE FOREST Eight Mile Lane NEWFOUNDLAND STATE FOREST at Glenugie Glenugie Glenugi Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Other upgrades Oxleyan Pygmy Perch habitat (from targeted surveys) High Threatened ecological communities Nationally Important Medium & SEPP 14 wetlands

State Forest, National Park,

Nature Reserve, State Conservation Area

Low

AI-14 Construction phase potential impact to targeted environmental receptors LOCATION WOODBURN EVANS HEAD MACLEAN WOOLGOOLGA ILARWILL Interchange Acid sulfate risk potential at Maclean High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, ODFORD NORTH STATE FOREST between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface

High probability of occurrence,
bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface YCINTYRES! ALE Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface
Low probability of occurrence, Woodford Island bottom sediments Disturbed terrain No known occurrence WOODFORD ISLAND NATURE RESERVE Kilometres

Oxleyan Pygmy Perch habitat (NSW DPI)

Threatened ecological communities

State Forest, National Park,

Oxleyan Pygmy Perch habitat (from targeted surveys)

Nature Reserve, State Conservation Area

Construction phase risk

Medium

Minimal

High

Low

The project

Other upgrades

Nationally Important

AI-15 Construction phase potential impact to targeted environmental receptors LOCATION WOODBURN EVANS HEAD Interchange at Iluka Road GIBBERAGEE STATE FOREST SWORTH HILL NSERVATION AREA Acid sulfate risk potential High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, Island bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain WATTS LANE No known occurrence Interchange at Island Watts Lane HARWOOD Interchange at CREEK ROAD MACLEAN lames Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Threatened ecological communities Nationally Important Medium

State Forest, National Park,

Nature Reserve, State Conservation Area

Low

Minimal

BALLINA LOCATION WOODBURN EVANS HEAD CLARENCE VALLEY upgrade project BUNDJALUNG STATE CONSERVATION AREA DEVILS PULPIT STATE FOREST WOOLGOOLGA Acid sulfate risk potential Jacky Bulbi Flat High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments

Disturbed terrain No known occurrence ILUKA ROAD Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Threatened ecological communities Nationally Important Medium & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area Minimal

AI-16 Construction phase potential impact to targeted environmental receptors

AI-17 Construction phase potential impact to targeted environmental receptors LOCATION WOODBURN EVANS HEAD WOOLGOOLGA SWAN BAY NEW ITALYROA MINYUMAR DOUBLEDUKE STATE FOREST Acid sulfate risk potential TARRIMORI E SWAMP NATURE RESERVE High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface GLENCOE FOREST ROAD High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, TABBIMOBLE STATE FOREST at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between 1 and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain No known occurrence Devils Pulpit upgrade project Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Threatened ecological communities Nationally Important Medium & SEPP 14 wetlands

State Forest, National Park,

Nature Reserve, State Conservation Area

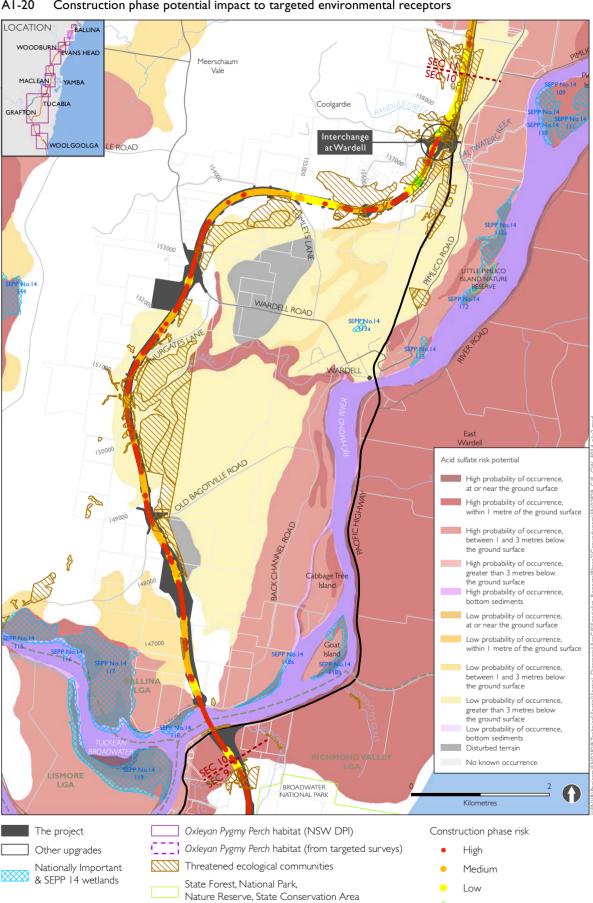
Low

LOCATION EVANS HEAD WOOLGOOLGA Kilgin North RICHMOND VALLEY ADWATER WOODBURN EVANS HEAD ROAD Doonbah Interchange at Woodburn Acid sulfate risk potential Low probability of occurrence, within I metre of the ground surface High probability of occurrence, at or near the ground surface Low probability of occurrence, between 1 and 3 metres below High probability of occurrence, the ground surface within I metre of the ground surface Low probability of occurrence, High probability of occurrence, between 1 and 3 metres below greater than 3 metres below the ground surface
Low probability of occurrence, the ground surface bottom sedimen High probability of occurrence, greater than 3 metres below the ground surface Disturbed terrain No known occurrence High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Threatened ecological communities Nationally Important Medium & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area

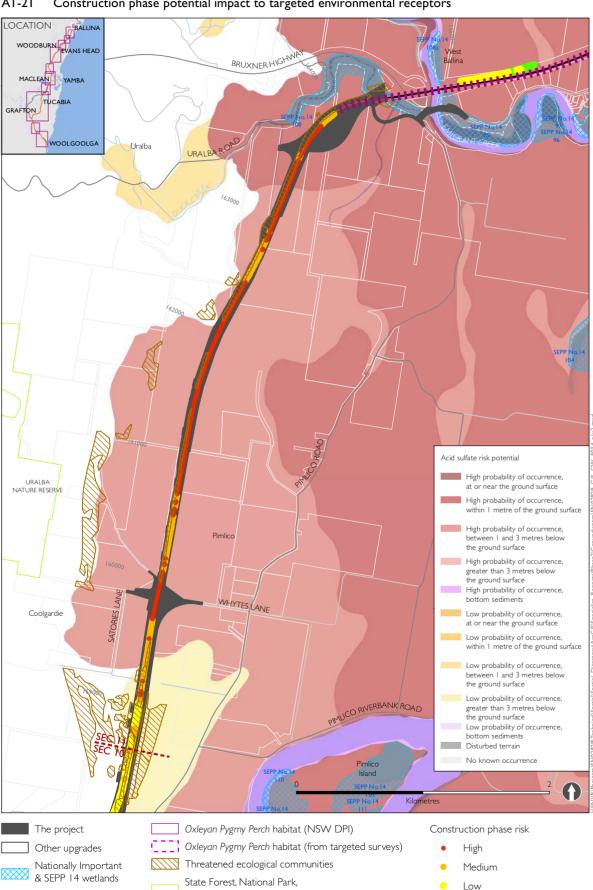
AI-18 Construction phase potential impact to targeted environmental receptors

LOCATION WOODBURN EVANS HEAD LISMORE LGA BROADWATER 4000 BROADWATER JATIONAL PARK RICHMOND STREET Interchange at Broadwater BROADWATER NATIONAL PARK Acid sulfate risk potential Low probability of occurrence, within I metre of the ground surface High probability of occurrence, at or near the ground surface Low probability of occurrence, between 1 and 3 metres below High probability of occurrence, the ground surface within I metre of the ground surface Low probability of occurrence, High probability of occurrence, between I and 3 metres below greater than 3 metres below the ground surface
Low probability of occurrence, the ground surface bottom sedimen High probability of occurrence, greater than 3 metres below the ground surface Disturbed terrain No known occurrence High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Oxleyan Pygmy Perch habitat (NSW DPI) The project Construction phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Threatened ecological communities Nationally Important Medium & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area

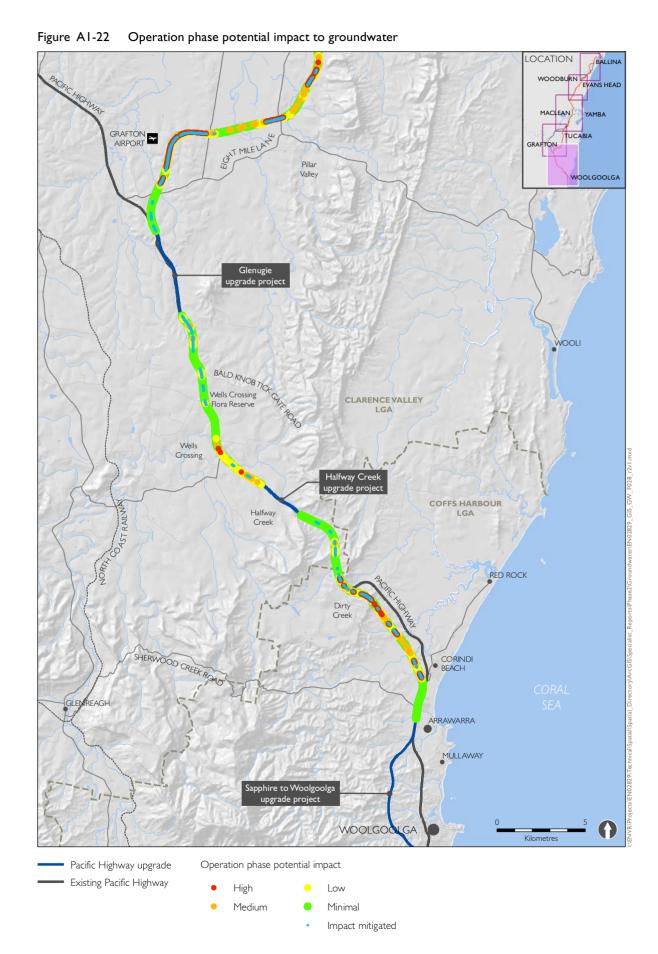
AI-19 Construction phase potential impact to targeted environmental receptors

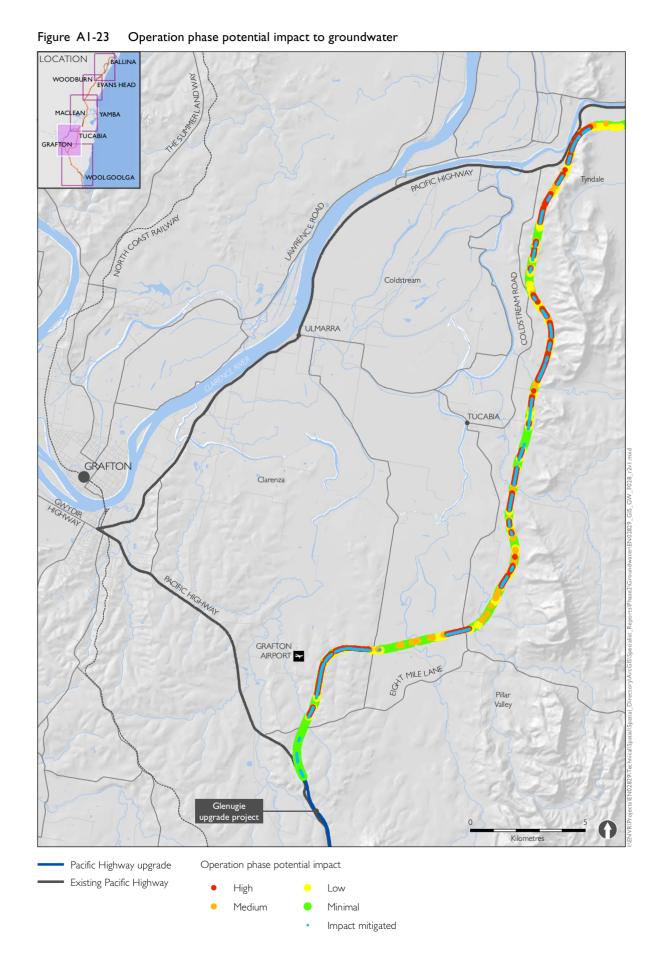


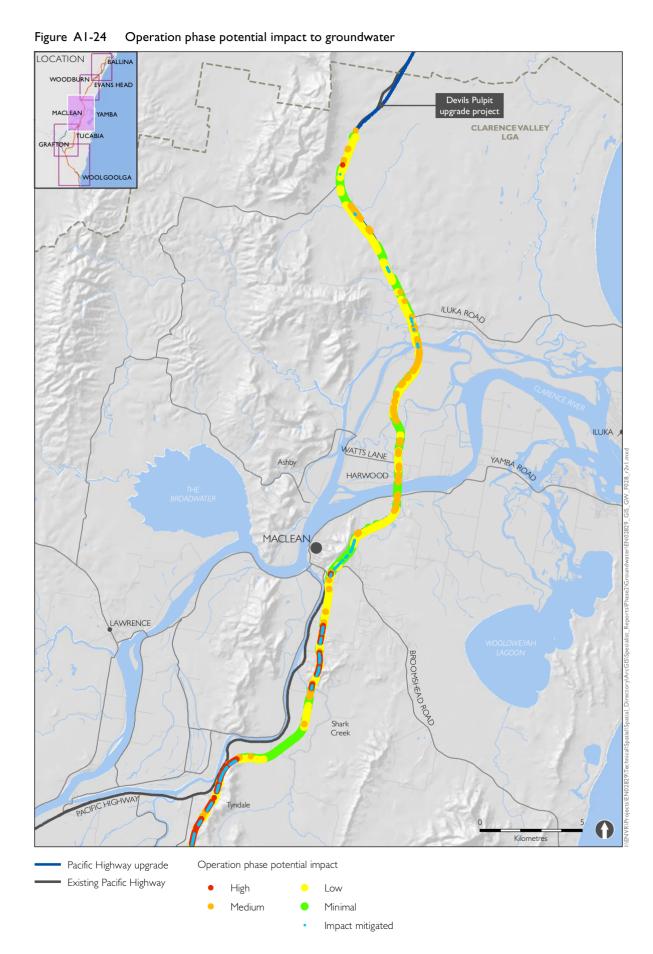
A1-20 Construction phase potential impact to targeted environmental receptors



A1-21 Construction phase potential impact to targeted environmental receptors







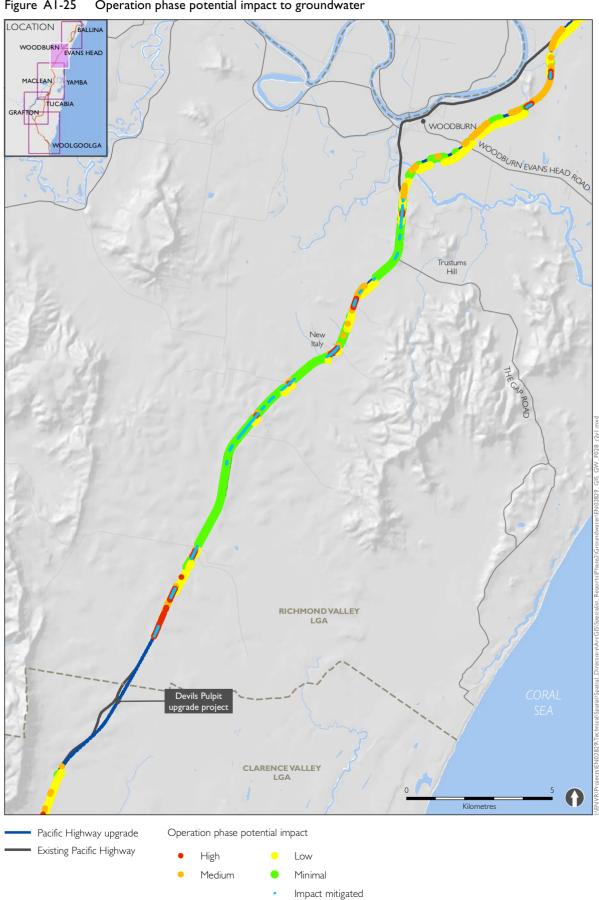
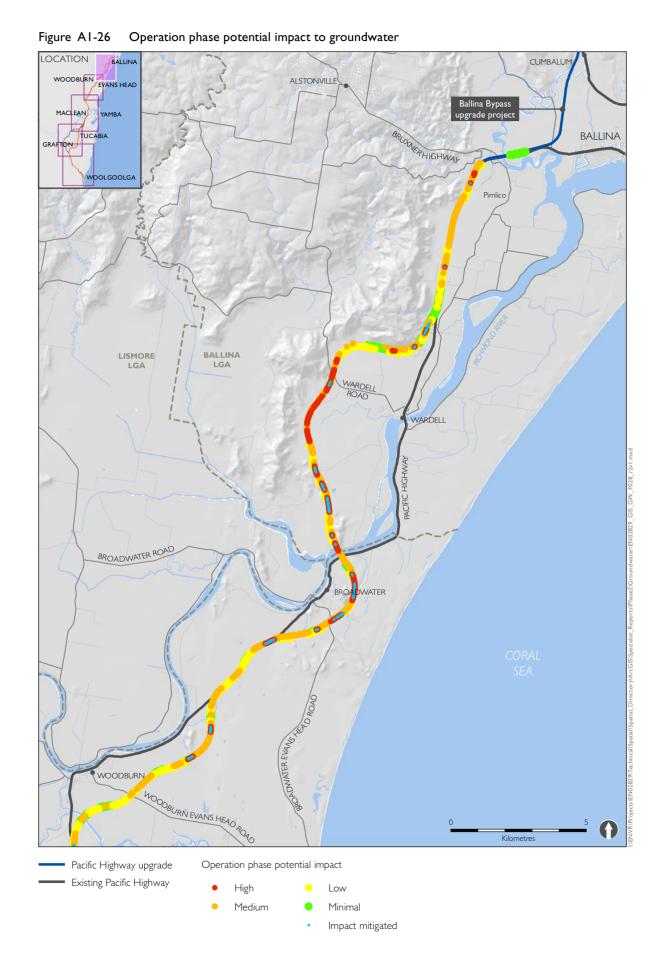
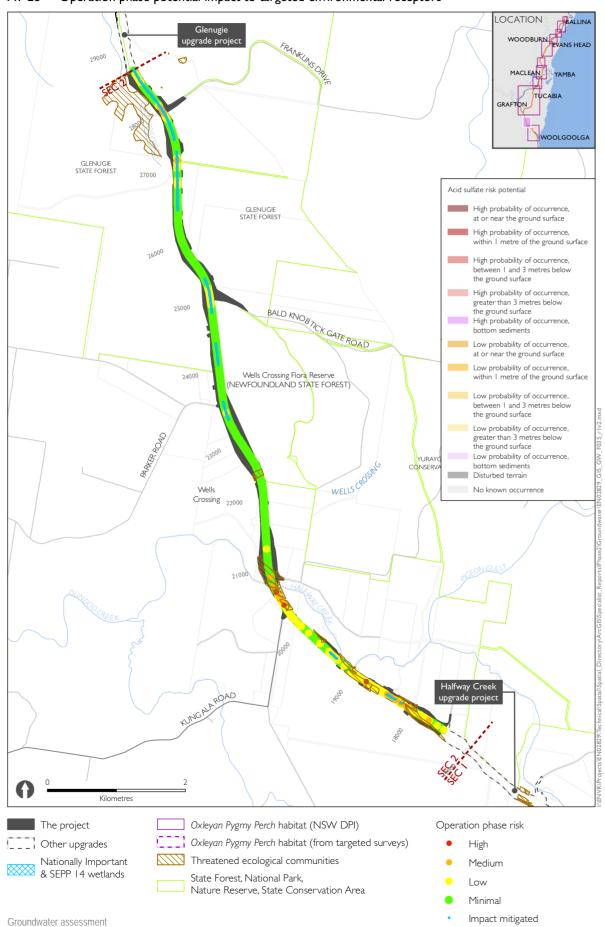


Figure A1-25 Operation phase potential impact to groundwater



A1-27 Operation phase potential impact to targeted environmental receptors BALLINA LOCATION WOODBURN EVANS HEAD YURAYGIR STATE ONSERVATION AREA Halfway Creek upgrade project WOOLGOOLGA NEWFOUNDLAND STATE FOREST YURAYGIR NATIONAL PARK Interchange at Range Roa **CLARENCE VALLEY** LGA RANGEROAD COFFS HARBOUR Acid sulfate risk potential High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface D CREEK ROAD Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between 1 and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments WEDDING BELLS STATE FOREST ARRAWARRA Disturbed terrain No known occurrence NATURE RESERVE Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Nationally Important Threatened ecological communities Medium & SEPP 14 wetlands State Forest, National Park, Low

A1-28 Operation phase potential impact to targeted environmental receptors



LOCATION WOODBURN EVANS HEAD Woodford WOOLGOOLGA Interchange at Tyndale Acid sulfate risk potential High probability of occurrence, at or near the ground surface 233 High probability of occurrence, within I metre of the ground surface PINE BRUSH STATE FOREST High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface SOMERVALE ROAD High probability of occurrence, OSTREAM ROAD bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface BOSTOCK ROAD Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain CANDOLE STATE FOREST No known occurrence Clarenza GRAFTON AIRPORT Pillar BOM BOM STATE FOREST MILE LANE WOOLI RO DIVINES STATE FOREST Eight Mile Lane NEWFOUNDLAND STATE FOREST at Glenugie Glenugi The project Oxleyan Pygmy Perch habitat (NSW DPI) Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area Minimal Impact mitigated

A1-29 Operation phase potential impact to targeted environmental receptors

A1-30 Operation phase potential impact to targeted environmental receptors LOCATION WOODBURN EVANS HEAD MACLEAN WOOLGOOLGA ILARWILL Acid sulfate risk potential Interchange at Maclean High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface ODFORD NORTH STATE FOREST High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface YCINTYRES! ALE Low probability of occurrence, between 1 and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Woodford Low probability of occurrence, Island bottom sediments Disturbed terrain WOODFORD ISLAND NATURE RESERVE Kilometres The project Oxleyan Pygmy Perch habitat (NSW DPI) Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low

A1-31 Operation phase potential impact to targeted environmental receptors LOCATION WOODBURN EVANS HEAD GIBBERAGEE STATE FOREST Interchange at Iluka Road SWORTH HILL NSERVATION AREA Acid sulfate risk potential High probability of occurrence, at or near the ground surface High probability of occurrence, vithin I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface Chatswort High probability of occurrence, Island bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between 1 and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain WATTS LANE Interchange at Island Watts Lane HARWOOD Interchange at CREEK ROAD MACLEAN lames Kilometre The project Oxleyan Pygmy Perch habitat (NSW DPI) Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Nationally Important Threatened ecological communities ${\sf Medium}$

State Forest, National Park,

Nature Reserve, State Conservation Area

Low

Minimal Impact mitigated

BALLINA LOCATION WOODBURN EVANS HEAD CLARENCE VALLEY upgrade project BUNDJALUNG STATE CONSERVATION AREA WOOLGOOLGA DEVILS PULPIT STATE FOREST Acid sulfate risk potential Jacky Bulbi Flat High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain ILUKA ROAD Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area Minimal Impact mitigated Groundwater assessment

A1-32 Operation phase potential impact to targeted environmental receptors

LOCATION WOODBURN EVANS HEAD WOOLGOOLGA SWAN BAY NEW ITALYROA MINYUMAR DOUBLEDUKE STATE FOREST Acid sulfate risk potential TARRIMORI E SWAMP NATURE RESERVE High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between I and 3 metres below the ground surface GLENCOE FOREST ROAD High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, bottom sediments Low probability of occurrence, TABBIMOBLE STATE FOREST at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain No known occurrence Devils Pulpit upgrade project Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area Minimal

Impact mitigated

A1-33 Operation phase potential impact to targeted environmental receptors

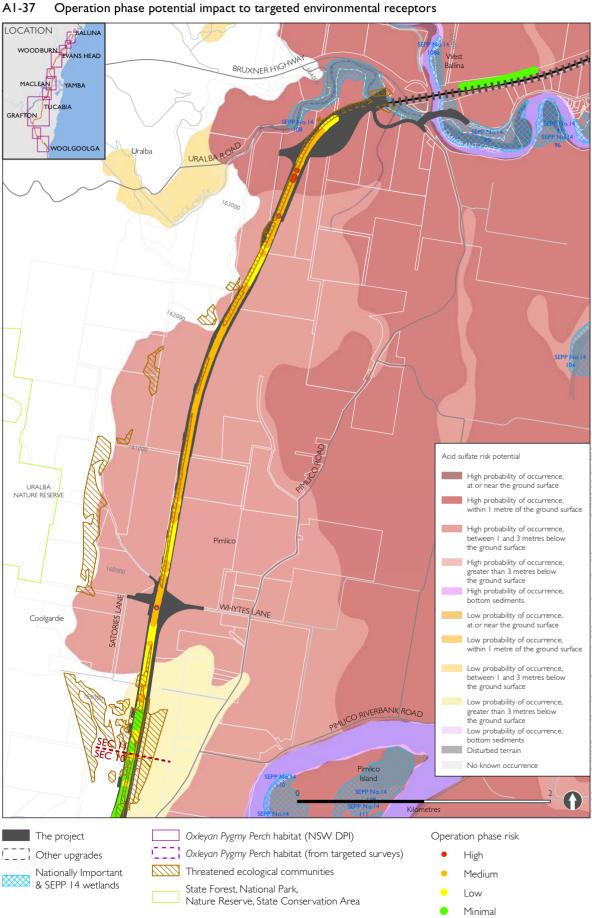
A1-34 Operation phase potential impact to targeted environmental receptors LOCATION EVANS HEAD WOOLGOOLGA Kilgin North RICHMOND VALLEY ADWATER WOODBURN EVANS HEAD ROAD Doonbah Interchange at Woodburn Low probability of occurrence, within I metre of the ground surface Acid sulfate risk potential High probability of occurrence, at or near the ground surface Low probability of occurrence, between I and 3 metres below the ground surface High probability of occurrence, vithin I metre of the ground surface Low probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, bottom sediments High probability of occurrence, Disturbed terrain greater than 3 metres below the ground surface No known occurrence High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) Other upgrades High Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low

LOCATION WOODBURN EVANS HEAD LISMORE LGA BROADWATER 400 RICHMOND STREET Interchange at Broadwater BROADWATER NATIONAL PARK Low probability of occurrence, within I metre of the ground surface Acid sulfate risk potential High probability of occurrence, Low probability of occurrence, at or near the ground surface between I and 3 metres below the ground surface High probability of occurrence, vithin I metre of the ground surface Low probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, bottom sediments High probability of occurrence, Disturbed terrain greater than 3 metres below the ground surface No known occurrence High probability of occurrence, bottom sediments Low probability of occurrence, at or near the ground surface Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High __ Other upgrades Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area

A1-35 Operation phase potential impact to targeted environmental receptors

LOCATION WOODBURN EVANS HEAD Coolgardie WOOLGOOLGA LE ROAD at Wardell WARDELL ROAD OLD BACOTINUE ROAD Acid sulfate risk potential High probability of occurrence, at or near the ground surface High probability of occurrence, within I metre of the ground surface High probability of occurrence, between 1 and 3 metres below the ground surface High probability of occurrence, greater than 3 metres below the ground surface High probability of occurrence, hottom sediments Low probability of occurrence, at or near the ground surface Low probability of occurrence, within I metre of the ground surface Low probability of occurrence, between I and 3 metres below the ground surface Low probability of occurrence, greater than 3 metres below the ground surface Low probability of occurrence, bottom sediments Disturbed terrain No known occurrence LISMORE broadwater National Park Kilometres Oxleyan Pygmy Perch habitat (NSW DPI) The project Operation phase risk Oxleyan Pygmy Perch habitat (from targeted surveys) High Other upgrades Nationally Important Threatened ecological communities ${\sf Medium}$ & SEPP 14 wetlands State Forest, National Park, Low Nature Reserve, State Conservation Area

A1-36 Operation phase potential impact to targeted environmental receptors



Impact mitigated