### **Table of Contents**

Executive Summary		ES.1	
Chapter 1 Introduction			
1.1	Background	1	
1.2	Approval process	2	
1.3	Overview of the approved project	9	
1.4	Need for the modification	9	
1.5	The proponent	10	
1.6	Purpose of this report	11	
Chapter 2	Proposed modification	13	
2.1	Description of the existing environment	13	
	2.1.1 Overview	13	
	2.1.2 Land parcels and ownership	13	
	2.1.3 Seaham section	14	
	2.1.4 Brandy Hill section	16	
	2.1.5 Millers Forest section	17	
	2.1.6 Tomago section	20	
2.2	Overview of the proposed modification	22	
2.3	Pipeline construction – description of approved activities	23	
	2.3.1 Site preparation	23	
	2.3.2 General construction process	24	
	2.3.3 Construction techniques for infrastructure and waterway crossings	28	
	2.3.4 Ancillary activities	30	
	2.3.5 Construction plant and equipment	33	
	2.3.6 Construction staging and hours	34	
	2.3.7 Construction workforce	35	
2.4	Pipeline operation – description of approved activities	35	
	2.4.1 General	35	
	2.4.2 Patrolling and inspections	35	
	2.4.3 Line of sight clearance	35	
	2.4.4 Weed control	35	
	2.4.5 Cathodic protection and coating integrity surveys	36	
	2.4.6 Supervisory control and data acquisition system (SCADA)	36	
	2.4.7 Pigging	36	
	2.4.8 Main line valve	36	
2.5	Tomago Receiving Station	36	
2.6	Pipeline decommissioning – description of approved activities	39	

i

Consultation	41
Consultation approach	41
Consultation methods and outcomes	42
3.2.1 Identified stakeholders	42
3.2.2 Consultation to date	42
Ongoing stakeholder consultation	46
Conflict management	47
Complaint management	47
Statutory framework	49
Environmental Planning and Assessment Act 1979	49
Other NSW legislation	50
4.2.1 Coastal Protection Act 1979	50
4.2.2 Gas Supply Act 1996	51
4.2.3 Heritage Act 1977	51
4.2.4 Hunter Water Regulation 2010	51
4.2.5 National Parks and Wildlife Act 1974	51
4.2.6 Native Vegetation Act 2003	52
4.2.7 Petroleum (Onshore) Act 1991	52
4.2.8 Pipelines Act 1967	52
4.2.9 Protection of the Environment Operations Act 1997	52
4.2.10 Roads Act 1993	52
4.2.11 Rural Fires Act 1997	53
4.2.12 Threatened Species Conservation Act 1995	53
4.2.13 Water Management Act 2000 and Water Act 1912	53
NSW policies	53
4.3.1 State environmental planning policies	53
4.3.2 Local environmental plans	61
Environment Protection and Biodiversity Conservation Act 1999	73
4.4.1 Overview	73
4.4.2 Controlled action – EPBC 2008/4432	74
4.4.3 Proposed modification	74
Environmental risk analysis	75
Ecology	79
Existing environment	79
6.1.1 Method	79
6.1.2 Results	80
6.1.3 Threatened species, populations and ecological communities	89
	Consultation approach Consultation methods and outcomes 3.2.1 Identified stakeholders 3.2.2 Consultation to date Ongoing stakeholder consultation Conflict management Complaint management  Statutory framework Environmental Planning and Assessment Act 1979 Other NSW legislation 4.2.1 Coastal Protection Act 1979 4.2.2 Gas Supply Act 1996 4.2.3 Heritage Act 1977 4.2.4 Hunter Water Regulation 2010 4.2.5 National Parks and Wildlife Act 1974 4.2.6 Native Vegetation Act 2003 4.2.7 Petroleum (Onshore) Act 1991 4.2.8 Pipelines Act 1967 4.2.9 Protection of the Environment Operations Act 1997 4.2.11 Rural Fires Act 1997 4.2.12 Threatened Species Conservation Act 1995 4.2.13 Water Management Act 2000 and Water Act 1912 NSW policies 4.3.1 State environmental planning policies 4.3.2 Local environmental plans Environment Protection and Biodiversity Conservation Act 1999 4.4.1 Overview 4.4.2 Controlled action – EPBC 2008/4432 4.4.3 Proposed modification  Environmental risk analysis  Ecology Existing environment 6.1.1 Method 6.1.2 Results

Table	Of Contents (conta)	
6.2	Impact assessment	90
	6.2.1 Approach to impact assessment	90
	6.2.2 Direct impacts	91
	6.2.3 Indirect impacts	93
	6.2.4 Threatened species, populations and ecological communities	94
	6.2.5 Cumulative impacts	95
6.3	Management and monitoring	95
6.4	Conclusion	96
Chapter 7	Aboriginal cultural heritage	97
7.1	Existing environment	97
	7.1.1 Environmental, landscape and ethnographic context	97
	7.1.2 Previous archaeological investigations	97
	7.1.3 Aboriginal Heritage Information Management System search	98
	7.1.4 Method	98
	7.1.5 Predictive model and survey strategy	100
	7.1.6 Survey results	101
	7.1.7 Significance assessment	102
7.2	Impact assessment	102
7.3	Management and monitoring	103
7.4	Conclusions	103
Chapter 8	Noise and vibration	105
8.1	Existing environment	105
	8.1.1 Potentially affected receptors	105
	8.1.2 Ambient noise environment	110
8.2	Impact assessment	111
	8.2.1 Construction	111
	8.2.2 Operations	116
8.3	Management and monitoring	120
8.4	Conclusions	121
Chapter 9	Hazard and risk	123
9.1	Existing environment	123
9.2	Impact assessment	123
	9.2.1 Assessment method	123
	9.2.2 Modified pipeline corridor alignment	124
	9.2.3 TRS and odourant facility	129
9.3	Management and monitoring	131
9.4	Conclusions	132

Chapter 10	Other environmental considera	ations 133	
10.1	Soils and agricultural suitability	133	
	10.1.1 Existing environment	133	
10.1 10.2 10.3 10.4 10.5	10.1.2 Impact assessment	139	
	10.1.3 Management and monitoring	141	
	10.1.4 Conclusion	141	
10.2	Surface water and flooding	141	
	10.2.1 Existing environment	141	
	10.2.2 Impact assessment	143	
	10.2.3 Management and monitoring	145	
	10.2.4 Conclusion	146	
10.3	Groundwater	146	
	10.3.1 Existing environment	146	
	10.3.2 Impact assessment	149	
	10.3.3 Management and monitoring	150	
	10.3.4 Conclusion	150	
10.4	Air quality	151	
	10.4.1 Existing environment	151	
	10.4.2 Impact assessment	151	
	10.4.3 Management and monitoring	153	
	10.4.4 Conclusion	154	
10.5	Socio economic	155	
	10.5.1 Existing environment	155	
	10.5.2 Impact assessment	158	
	10.5.3 Management and monitoring	159	
	10.5.4 Conclusion	159	
10.6	European and non-Aboriginal heritage	160	
	10.6.1 Existing environment	160	
	10.6.2 Impact assessment	160	
	10.6.3 Management and monitoring	162	
	10.6.4 Conclusion	162	
10.7	Visual	162	
	10.7.1 Existing environment	162	
	10.7.2 Impact assessment	162	
	10.7.3 Management and monitoring	163	
	10.7.4 Conclusion	163	
10.8	Greenhouse gases	163	
10.9	Traffic and access	164	
10.10	Bushfire	164	

Table of contents (conta)	
10.11 Cumulative impacts	165
Chapter 11 Statement of commitments	167
11.1 Introduction	167
11.2 Statement of commitments	167
11.3 Amendments to Project and Concept Plan approvals	169
Chapter 12 Conclusions and justification	173
12.1 Introduction	173
12.2 Justification for the proposed modification	173
12.3 Objects of the EP&A Act	174
12.4 Principles of ESD	175
12.4.1 The precautionary principle	175
12.4.2 Inter-generational equity	176
12.4.3 Conservation of biological diversity and ecological integrity	176
12.4.4 Valuation and pricing of resources	176
12.5 Conclusion	177
References	
Acronyms	

### Appendices

Α	Project Approval and Concept Plan Approval
В	Schedule of Lands
С	Ecological assessment
D	Aboriginal cultural heritage assessment
E	Noise and vibration assessment
F	Addendum to the GGP preliminary hazard analysis

### Tables

2.1	Land parcels and ownership	14
3.1	Communication tools	43
3.2	Consultation and notification record	44
4.1	Consideration of relevant Mining SEPP, Part 3 matters	55
4.2	Consideration of relevant SEPP 71, Clause 8 matters	59
4.3	Consideration of Williams River Catchment Plan aims and objectives	61

### **Tables**

4.4	Relevant LEP provisions	66
5.1	General qualitative environmental risk analysis results – unmitigated scenario	75
6.1	Waterways intersected by the modified pipeline corridor alignment at Seaham	88
6.2	Waterways intersected by the modified pipeline alignment at Millers Forest	89
6.3	Waterways intersected by the modified pipeline alignment at Tomago	89
6.4	Threatened fauna species assessed	90
6.5	Comparison of vegetation clearing for the approved and realigned sections	92
6.6	Design optimisation to minimise vegetation disturbance	92
6.7	Key ecological features and recommendations	96
8.1	Short term 15-minute attended background noise measurements, 4 October 2013	112
8.2	Construction noise criteria – standard and out of hours	113
8.3	Predicted pipeline construction noise levels L <sub>eq(15-min)</sub> , dB(A)	114
8.4	Predicted TRS construction noise levels L <sub>eq(15-min)</sub> , dBA	114
8.5	Predicted construction noise levels L <sub>eq(15-min)</sub> , dB(A)	116
8.6	Airblast overpressure and ground vibration limits	118
8.7	Operational criteria – TRS	119
8.8	Recommended acceptable and maximum amenity criteria – cumulative noise	120
8.9	Modelled meteorological conditions – TRS operation	120
8.10	Predicted operational noise levels at receptors – TRS	121
8.11	Cumulative noise assessment at sensitive receptors	122
9.1	Pipeline design cases – PHA results	129
9.2	Changes to hazards and risks for the Seaham section	130
9.3	Changes to hazards and risks for the Brandy Hill section	131
9.4	Changes to hazards and risks for the Millers Forest section	132
9.5	Changes to hazards and risks for the Tomago section	132
9.6	Gas-related infrastructure (ie HDS) risk profile	134
10.1	Watercourse crossing assessment for re-aligned gas transmission pipeline route	148
10.2	Dual water bath heater maximum ground level concentrations (μg/m³)	158
10.3	Maximum allowable discharge concentration limits (Air) <sup>1</sup>	159
10.4	Periodic pollutant and parameter monitoring (air) <sup>1</sup>	159
10.5	Socio-economic characteristics summary: Lower Hunter sub-region	162
10.6	Heritage items in vicinity of proposed modification	165
10.7	Estimated annual greenhouse gas emission - Scopes 1, 2 and 3	169
11.1	Summary of relevant Project approval conditions	171
11.2	Amendment to 3 – Operational Noise Limits	173
11.3	Amendment to 4 – Identification of Air Monitoring and Discharge Points	174
11.4	Amendment to 5 – Maximum Allowable Discharge Concentration Limits (Air)	175
11.5	Amendment to 6 –Periodic Pollutant and Parameter Monitoring (Air)	175

### Figures

ES1	Locality plan showing the proposed modification	ES.3
1.1	Gloucester Gas Project and the proposed modification	3
1.2	Locality plan showing the proposed modification	4
1.3	Seaham section	5
1.4	Brandy Hill section	6
1.5	Millers Forest section	7
1.6	Tomago section	8
2.1	Seaham section – photo log	15
2.2	Brandy Hill section – photo log	18
2.3	Millers Forest section – photo log	19
2.4	Tomago section – photo log	21
2.5	Pipeline right of way – schematic diagrams	25
2.6	Thrust boring and HDD - schematic diagrams	31
2.7	Photos of typical pipeline construction processes	32
2.8	Tomago Receiving Station – indicative layout	38
4.1	Millers Forest and Tomago sections – Mining SEPP CSG buffer zones	57
4.2	Seaham section – land zoning and cadastre map	62
4.3	Brandy Hill section – land zoning and cadastre map	63
4.4	Millers Forest section – land zoning and cadastre map	64
4.5	Tomago section – land zoning and cadastre map	65
6.1	Seaham section – surveyed vegetation and watercourse crossings	81
6.2	Brandy Hill section – surveyed vegetation	82
6.3	Millers Forest section – watercourse crossings	84
6.4	Tomago section – surveyed vegetation and watercourse crossings	85
6.5	Brandy Hill section – Potential Koala habitat	87
7.1	Locality plan showing AHIMS search results	101
8.1	Seaham section - short term monitoring locations and sensitive receptors	108
8.2	Brandy Hill section - short term monitoring locations and sensitive receptors	109
8.3	Millers Forest section - sensitive receptors	110
8.4	Tomago section - short term monitoring locations and sensitive receptors	111
10.1	Seaham section – soil landscapes	138
10.2	Brandy Hill section – soil landscapes	139
10.3	Millers Forest section – soil landscapes	140
10.4	Tomago section – soil landscapes	141
10.5	Brandy Hill section to Tomago section – acid sulfate soils	142
10.6	Groundwater management areas	153
10.7	Seaham section – historic heritage items	166

### Photographs

10.1 Constructed drainage line

147