Appendix F

Waterway crossing methodologies

Table F1 Summary of proposed waterway crossings

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
W1	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W2	Unnamed	Intermittent	Valley Fill	Moderate	No	Low - moderate	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Low-moderate risk of increasing bank instability, although considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W3	Kellys Creek	Perennial	Low Sinuosity Fine Grained	Moderate	No	Low	Underbore	Trenching or HDD	It is proposed to trench this waterway however aquatic ecology surveys have not been undertaken. The proposed method of waterway crossing will be determined once the surveys have been completed.
W4	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Low-moderate risk of increasing bank instability, although considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W5	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W6	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W7	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W8	Unnamed	Intermittent	Valley Fill	Moderate	No	Low - moderate	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Existing headward erosion, although considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W9	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W10	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W11	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W12	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W13	Unnamed	Intermittent	Channelised Fill	Poor	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W14	Medway Rivulet	Ephemeral	Low Sinuosity Fine Grained	Poor	No	Low	Trenching	Trenching	Stable waterway
W15	Unnamed	Ephemeral	Channelised Fill	Poor	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W16	Unnamed	Ephemeral	Low Sinuosity Fine Grained	Moderate	No	Low	Trenching	Trenching	Stable waterway
W17	Unnamed	Intermittent	Channelised Fill	Poor	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W18	Unnamed	Ephemeral	Channelised Fill	Poor	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W19	Wells Creek	Ephemeral	Channelised Fill	Poor	No	Low - moderate	Underbore	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Low-moderate risk of increasing bank instability, although considered able to be trenched in the geomorphic

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W20	Unnamed	Intermittent	Channelised Fill	Poor	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill) with existing headward erosion. Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W21	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W22	Black Bobs Creek	Ephemeral	Low Sinuosity Fine Grained	Moderate	No	Low	Trenching	Trenching	Stable waterway
W23	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W24	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W25	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W26	Unnamed	Intermittent	Valley Fill	Moderate	Yes	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching. This has been accounted for in the vegetation clearing calculations.

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W27	Long Swamp Creek	Ephemeral	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W28	Unnamed	Intermittent	Headwater	Moderate	Yes	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W29	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W30	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W31	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W32	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching. It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W33	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									mitigation measures in Section 15.5 of the Environmental Assessment.
W34	Unnamed	Intermittent	Headwater	Good	No	Low	Trenching	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W35	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W36	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W37	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W38	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W39	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W40	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W41	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.Some native vegetation present which would be removed during trenching.
W42	Unnamed	Intermittent	Valley Fill	Good	Yes*	Low-moderate	Underbore	Trenching	Evidence of headward erosion upstream. It is recognised that this is a fragile waterway (Valley Fill) in good condition. Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. Some native vegetation present which would be removed during trenching.
W43	Unnamed	Intermittent	Valley Fill	Good	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.Some native vegetation present which would be removed during trenching.
W44	Unnamed	Intermittent	Valley Fill	Good	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									Assessment.Some native vegetation present which would be removed during trenching.
W45	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W46	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W47	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W48	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W49	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W50	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W51	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W52	Paddys River	Perennial	Bedrock Controlled Fine Grained	Moderate	Yes*	Low	Underbore	Trenching	Trenching based on the aquatic ecology and geomorphology assessments. HDD may be used by the contractor.

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
W53	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W54	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W55	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. Some native vegetation present which would be removed during trenching.
W56	Uringalla Creek	Perennial	Low Sinuosity Fine Grained	Moderate	Yes*	Low	Underbore	Trenching	Confluence with Back Creek. Trenching based on the aquatic ecology and geomorphology assessments. HDD may be used by the contractor.
W57	Back Creek	Perennial	Low Sinuosity Fine Grained	Moderate	Yes	Low	Underbore	Trenching	Confluence with Uringalla Creek. Trenching based on the aquatic ecology and geomorphology assessments. HDD may be used by the contractor.
W58	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W59	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
W60	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W61	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W62	Unnamed	Intermittent	Headwater	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W63	Unnamed	Intermittent	Valley Fill	Good	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. The creek is in good natural condition however it is an intermittent drainage line which is located adjacent to the existing gas pipeline. Some native vegetation present which would be removed during trenching. Thus, trenching has been proposed for this crossing.
W64	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Some native vegetation present which would be removed during trenching. Thus, trenching has been proposed for this crossing.
W65	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									Assessment.
W66	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway.
W67	Unnamed	Intermittent	Valley Fill	Moderate	No	Low-moderate	Underbore	Trenching	Evidence of existing headward erosion. Fragile waterway (Valley Fill). See proposed mitigation measures in Section 15.5.
W68	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway.
W69	Jaorimin Creek	Perennial	Bedrock Controlled Sand	Good	Yes*	Low-moderate	Underbore	Trenching	Waterway is to be trenched based on geomorphic and aquatic ecology assessments. HDD cannot be utilised due to the impact on native vegetation that would occur if the pipeline was moved.
W70	Unnamed	Intermittent	Headwater	Good	No	Low	Trenching	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W71	Unnamed	Intermittent	Headwater	Good	No	Low	Trenching	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing.
W72	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W73	Unnamed	Intermittent	Headwater	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W74	Unnamed	Intermittent	Headwater	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W75	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W76	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W77	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W78	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W79	Unnamed	Intermittent	Channelised Fill	Poor	No	Low - moderate	Underbore	Trenching	It is recognised that this is a fragile waterway (Channelised Fill) with a low – moderate risk of increasing bank instability. Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W80	Unnamed	Intermittent	Valley Fill	Moderate	No	Low - moderate	Underbore	Trenching	Low – moderate risk of increasing headward erosion. Fragile waterway (Valley Fill). See mitigation measures in Section 15.5.
W81	Lockyersleigh Creek	Ephemeral	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W82	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W83	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W84	Narambulla Creek	Perennial	Chain of Ponds	Moderate	No	Low	Underbore	HDD	HDD due to fragile waterway – Chain of Ponds
W85	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W86	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W87	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. Some native vegetation present which would be removed during trenching.
W88	Unnamed	Intermittent	Headwater	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W89	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. Some native vegetation present which would be removed during trenching.
W90	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W91	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W92	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W93	Unnamed	Intermittent	Headwater	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W94	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W95	Osborns Creek	Ephemeral	Confined	Moderate	Yes*	Low	Underbore	Trenching	Some native vegetation present which would be removed during trenching.
W96	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W97	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W98	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W99	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W100	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W101	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. Some native vegetation present which would be removed during trenching.
W102	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									Assessment. Some native vegetation present which would be removed during trenching.
W103	Unnamed	Intermittent	Valley Fill	Moderate	Yes*	Low	Underbore	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment. Some native vegetation present which would be removed during trenching.
W104	Unnamed	Intermittent	Headwater	Good	Yes*	Low	Underbore	Trenching	The creek is in good natural condition however it is an intermittent, headwater drainage line which is a stable, resilient geomorphic stream type and is located adjacent to the existing gas pipeline. Thus, trenching has been proposed for this crossing. Some native vegetation present which would be removed during trenching.
W105	Wollondilly River	Perennial	Bedrock Controlled Fine Grained	Moderate	Yes*	Low	Underbore	Pipe laying and anchoring	Pipe laying and anchoring based on aquatic ecology, geomorphology and technical constraints (shallow bedrock)
W106	Wollondilly River	Perennial	Bedrock Controlled Fine Grained	Moderate	No	Low	Underbore	Trenching or HDD	Aquatic ecology surveys and geomorphic assessment confirmed that trenching could be used at this location. The contractor may use HDD where the pipeline can be moved away from the gas pipeline.
W107	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W108	Boxers Creek	Perennial	Channelised Fill	Poor	No	Low - moderate	Underbore	Trenching	Channelised fill river style in poor condition, incised to bedrock. Although there are some low-moderate instability risks, trenching is considered an appropriate method the creek does not convey permanent water (although considered perennial). Therefore, trenching is proposed.

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
W109	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W110	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W111	Unnamed	Intermittent	Channelised Fill	Poor	No	Low-moderate	Underbore	Trenching	It is recognised that this is a fragile waterway (Channelised Fill) with low-moderate risk of increasing bank instability. Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W112	Unnamed	Ephemeral	Low Sinuosity Fine Grained	Poor	No	Low	Trenching	Trenching	Stable waterway.
W113	*Unnamed*	*Intermittent*	*Channelised Fill*	*Poor*	*No*	*Low*	-	-	*No longer impacted by construction*
W114	*Unnamed*	*Intermittent*	*Channelised Fill*	*Poor*	*No*	*Low*	-	-	*No longer impacted by construction*
W115	*Unnamed*	*Intermittent*	*Headwater*	*Good*	*Yes*	*Low*	-	-	*No longer impacted by construction*
W116	*Unnamed*	*Intermittent*	*Headwater*	*Good*	*Yes**	*Low*	-	-	*No longer impacted by construction*
W117	*Unnamed*	*Intermittent*	*Headwater*	*Moderate*	*No*	*Low*	-	-	*No longer impacted by construction*
W118	*Unnamed*	*Intermittent*	*Headwater*	*Good*	*Yes*	*Low*	-	-	*No longer impacted by construction*
W119	Wollondilly River	Perennial	Bedrock Controlled Fine Grained	Moderate	Yes*	Low	Underbore	Pipe laying and anchoring	Pipe laying and anchoring based on aquatic ecology, geomorphology and technical constraints (shallow bedrock)

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
W120	Kenmore Creek	Perennial	Low Sinuosity Fine Grained	Moderate	Yes*	Low	Underbore	Trenching or HDD	Trenching subject to further aquatic ecology investigations. The contractor may use HDD.
W121	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W122	Kenmore Creek	Ephemeral	Low Sinuosity Fine Grained	Moderate	No	Low	Trenching	Trenching	Stable waterway
W123	*Kenmore Creek*	*Ephemeral*	*Low Sinuosity Fine Grained*	*Poor*	*No*	*Low*	-	-	*No longer impacted by construction*
W124	*Kenmore Creek*	*Intermittent*	*Valley Fill*	*Poor*	*No*	*Low*	-	-	*No longer impacted by construction*
W125	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W126	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W127	Unnamed	Intermittent	Channelised Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Channelised Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W128	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W129	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W130	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W131	Wollondilly River	Perennial	Bedrock Controlled Fine Grained	Moderate	Yes	Low	Underbore	Pipe laying and anchoring	Pipe laying and anchoring based on aquatic ecology, geomorphology and technical constraints (shallow bedrock)
W132	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W133	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W134	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See

Waterway ID	Waterway name	Flow frequency	River Style[2]	Geomorphic condition[3]	Native riparian vegetation present[4]	Risk of inducing / increasing instability	NOW recomm. crossing method[5]	PPR proposed crossing method	Comment
									mitigation measures in Section 15.5 of the Environmental Assessment.
W135	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.
W136	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W137	Unnamed	Intermittent	Headwater	Moderate	No	Low	Trenching	Trenching	Stable waterway
W138	Unnamed	Intermittent	Valley Fill	Moderate	No	Low	Trenching	Trenching	It is recognised that this is a fragile waterway (Valley Fill). Considered able to be trenched in the geomorphic assessment with the implementation of controls. A waterways management plan is being developed to specify reinstatement of waterways post construction. See mitigation measures in Section 15.5 of the Environmental Assessment.