

These tables set out the operational controls required to achieve the objectives and targets set out in Environmental Program 09 Trenching and Pipeline Installation Management.

BBA will, as a minimum, implement the control activities and performance measures set out below.

- Table OCO 1.1 Erosion and Sediment Control
- Table OCO 2.1 Soil and Water Management
- Table OCO 3.1 Contaminated Soil Management
- Table OCO 4.1 Acid Sulphate Soils Management
- Table OCO 5.1 Site Preparation and Rehabilitation
- Table OCO 7.1 Storage and Use of Hazardous Materials, Fuels and Lubricants
- Table OCO 9.1 Trenching and Pipeline Installation Management
- Table OCO 12.1 Weed and Pathogen Management

Table OCO 9.1 Trenching and Pipeline Installation Management

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
INDUCTION AND TRAINING							
1.	Design Consultant briefing	CEMP 10	The Design Consultants will be briefed on the design aspects of this Control Document	Design Director	Prior to start of design.	Briefing record	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

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2.	Project and site induction	CEMP 13 APIA Code	All employees, consultants and subcontractors involved will be inducted into the environmental aspects and controls related to this Control Document. The induction will provide environmental management information including the environmental policies, the Environmental Management System, statutory, industry and community obligations and work procedures relevant to the site.	Construction Director or Project Manager, as applicable Start up Manager for Early Works	Prior to personnel commencing work on site	Induction records	
3.	Staff Construction Environmental Management Plan Induction	CEMP 13	All relevant staff will be inducted into the requirements of the Construction Environmental Management Plan and all associated documents.	Construction Director or Project Manager, as applicable	Prior to staff commencing work on site	Induction records	
4.	Awareness Training	CEMP 13 CEMP 14 APIA Code	Conduct awareness instruction of relevant BBA staff, contractors and field personnel. Objectives of Trenching and Pipeline Installation Management awareness training include: <ul style="list-style-type: none"> Matters requiring protection (eg. sensitive sites). Risk of encountering unexpected matters. 	Project Manager	As per Training Plan	Training records	
5.	Briefings	CEMP 13 CEMP 14 APIA Code	Environmental briefings shall emphasize site-specific control requirements.	General Superintendent	Prior to working in a specific area	Record of briefing (eg SEP Briefing)	

DESIGN AND PRE-CONSTRUCTION

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
6.	Access permission	RJ1, 33,pg 7, (Seq pg 503) RJ2, 36, pg 7, (Seq pg 511) APIA Code	Appropriate permission will be gained for property access, from state and private landholders.	General Superintendent	Prior to working in a specific area	Record of permission	
7.	Establish photo points	LU1, Part 3, Sect 2, 2DR1.2, pg 76, (Seq pg 89) LU3, Part 3, RH1.2, pg 36, (Seq pg 275) LU4, Part 3, RH1.2, pg 37, (Seq pg 326)	Establish photo points for monitoring sites susceptible to erosion, destabilization, acid sulphate soils or other impacts, and of ecologically sensitive areas for use as a baseline	Environmental Manager	Prior to working in a specific area	Sites identified	
8.	Identify sensitive areas	Project Requirement EPBC 23, 24, 25, 27, 28 APIA Code	Identify from available documentation and plans, all construction areas and their respective land use and significance (i.e. pasture or native vegetation, archaeological and cultural significance).	Environmental Manager	Prior to working in a specific area	Sites identified	
9.	Delineate all construction areas	EPBC 20(6)	Inspect the easement and identify all construction areas, access tracks, car parks and other infrastructure and delineate them with flagging tape (other flagging options will include delineator rope or electric fencing tape)	General Superintendent	Prior to working in a specific area	Sites delineated	
10.	Temporary creek crossings	LU1, Part 3, Sect 5, 5SW1.1, pg 149, (Seq pg 162) LU1, Part 3, Sect 6, 6SW1.1, pg 161, (Seq pg 174) LU3, Part 3, SW1.1, pg 26, (Seq pg 265) LU4, Part 3, SW1.1, pg 27, (Seq pg 316)	The design of temporary vehicle access routes over existing waterways shall avoid environmentally sensitive areas, as far as practicable. Temporary crossings shall be designed in accordance with the APIA pipeline code.	Design Director	Design phase	Verified and validated design	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
11.	Don't impede aquatic life movement	LU1, Part 3, Sect 5, 5SW7.1, pg 150, (Seq pg 163) LU1, Part 3, Sect 6, 6SW7.1, pg 162, (Seq pg 175) LU3, Part 3, SW7.1, pg 26, (Seq pg 265) LU4, Part 3, SW7.1, pg 27, (Seq pg 316)	Crossing designs must ensure that passage of aquatic life will not be precluded.	Design Director	Design phase	Verified and validated design	
12.	Trevallyn Dam water intake screen	LU4, Part 3, FN9.1, pg 33, (Seq pg 322)	If practicable, the water intake from Lake Trevallyn must include an effective screen or similar to prevent eels entering the pipe for the duration of the pipeline usage	Design Director	Design phase	Verified and validated design by Director of Inland Fisheries	
13.	Hydrologic design	Project Requirement	Infrastructure that may impact on waterways shall be designed in accordance with the guidelines provided by the APIA pipeline code.	Design Director	Design phase	Verified and validated design	
14.	Soft engineering to be used for creek stabilisation and realignments	Project Requirement	All works within the existing waterway riparian environment shall be designed in accordance with soft engineering principles for creek re-alignment works. Refer to the attached Bank Stabilisation: Type Cross Section 1 – Rockwork treatments, and also the APIA pipeline code.	Design Director	Design phase	Verified and validated design	
15.	Identify infrastructure	Project Requirement	Existing buried infrastructure including pipelines, communication cables, and electrical supplies shall be identified and protection measures applied	General Superintendent	Prior to working in a specific area	Record of identification	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

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16.	Delineate sensitive sites	Best practice EPBC 20(b) EPBC 21(b) EPBC 23(b) EPBC 24(c)	Delineate all sensitive sites with proximity to construction areas with flagging tape (other flagging options will include delineator rope or electric fencing tape) to prevent damage to listed species. To the extent practicable, micrositing of the pipeline alignment will be undertaken to avoid habitat if and where the green and gold bell frog (<i>Litoria raniformis</i>), Central North burrowing crayfish (<i>Engaeus granulatus</i>), the Mt Arthur burrowing crayfish (<i>Engaeus orramakunna</i>), <i>Xanthorrhoea aff. bracteata</i> species are identified. To the extent practicable, the pipeline corridor width should be less than 20 m in areas where there are threatened flora species.	Environmental Manager	Prior to working in a specific area	Sites delineated	
17.	Controls before works	Project Requirement	All waterway protection controls must be implemented and functional prior to the commencement of other works.	General Superintendent	Initial site preparation	Verified and validated design	
18.	No groundwater abstraction	Project Requirement	No groundwater abstraction may be undertaken for construction purposes	General Superintendent	Design phase and ongoing	Site Environmental Plan	
CONSTRUCTION							
Access tracks							

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
19.	Existing tracks	LU1, Part 3, Sect 5, 5ER3.1, pg 149, (Seq pg 162) LU1, Part 3, Sect 5, 5FN1.1, pg 154, (Seq pg 167) LU1, Part 3, Sect 6, 6ER3.1, pg 161, (Seq p 174) LU3, Part 3, ER4.1, pg 25, (Seq pg 264) LU4, Part 3, ER4.1, pg 26, (Seq pg 315) EPBC 20(c) APIA Code	All vehicle access will be confined to existing roads and tracks that have been subject to flora and fauna surveys. Permanent access tracks located in native vegetation areas must be as narrow as practicable in order to minimise the clearance of native vegetation.	General Superintendent	Prior to working in a specific area	Tracks identified	
20.	Landowner permission requirements	Project Requirement APIA Code	Specific information will be collected prior to entry onto the sites concerning landholder requirements for property access	General Superintendent	Prior to working in a specific area	Record of permission	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

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21.	Upgraded tracks	Project Requirement EPBC 24(f)	<p>Where upgraded tracks are required, they will:</p> <ul style="list-style-type: none"> ▶ follow the shortest routes ▶ follow ridge lines, spur crests and flat areas wherever possible ▶ be constructed to relevant safety and regulatory authority standards and able to withstand projected traffic volumes ▶ be constructed in a manner which minimises land clearance and ▶ implement correct drainage and sediment and erosion controls (refer to Erosion Control procedure) ▶ minimise disruption to existing drainage patterns ▶ be located to avoid all localities of <i>Xanthorrhoea. aff. bracteata</i> species. 	General Superintendent	Prior to working in a specific area	Tracks identified	
22.	Prior consultation	Project Requirement APIA Code	Prior to access road location and construction, consultation will be required with landholders and regulatory authorities regards specific management issues, access route location, utilisation of existing roads and the development of appropriate Alliance Traffic Management Plans	General Superintendent	Prior to working in a specific area	Consultation records	
23.	Service disruption	Project Requirement APIA Code	Service providers and users will be advised in advance of the timing and duration of planned disruptions to services, and approval from providers will be obtained.	General Superintendent	Prior to working in a specific area	Service owner consent	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
24.	Layout	Project Requirement APIA Code	Layout of access roads will be designed to minimise the area of disturbance and highly visible construction boundary markers will be used to define the construction zone. All construction activities will remain inside the delineated construction zone.	General Superintendent	Prior to working in a specific area	Works areas delineated	
25.	Sensitive sites	Project Requirement EPBC 24 APIA Code	Access road location will avoid significant and environmentally sensitive sites (such as <i>Xanthorrhoea. aff. bracteata</i>) including those of cultural and historic significance	General Superintendent	Prior to working in a specific area	Sites avoided	
26.	Weeds and pathogens	Project Requirement EPBC 24 APIA Code	Access road location will avoid areas of known weed and pathogen. Management procedures to minimise the risk of spreading the root rot fungus <i>Phytophthora cinnamomi</i> will be implemented. DPIW <i>Phytophthora cinnamomi</i> guidelines (such as vehicle hygiene) and weed control guidelines will be followed.	General Superintendent	Prior to working in a specific area	Sites avoided	
27.	Closure	Project Requirement APIA Code	Following the completion of construction activities, all temporary access tracks will be closed and rehabilitated to a condition comparable to the surrounding landscape. Construction materials will be removed.	General Superintendent	After work is completed	Tracks closed and rehabilitated	
28.	Barriers	Project Requirement APIA Code	Use physical barriers to restrict access to these tracks and where tracks are required to be left open, fences and gates will be installed as agreed with landowners.	General Superintendent	After work is completed	Barriers and fences installed	

Pads, worksites and storage facilities

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
29.	Landowner permission requirements	RJ1, 33, pg 7, (Seq pg 503) RJ2, 36, pg 7, (Seq pg 511) APIA Code	Specific information will be collected prior to entry onto the sites concerning landholder requirements for property access	General Superintendent	Prior to working in a specific area	Record of permission	
30.	Proximity to works	Project Requirement	Where practicable, sites should be located in areas near the pipeline easement and adjacent to access tracks, roads, or existing construction sites and local work areas	General Superintendent	Prior to working in a specific area	Proximity records	
31.	Siting	Project Requirement EPBC 23,24 APIA Code	New construction sites should be located at existing clearings or disturbed areas where possible and on well drained land with suitable access in all weather conditions. Areas adjacent to waterways will be avoided.	General Superintendent	Prior to working in a specific area	Siting records	
32.	Amenities	DIIS	On-site portable toilets will be provided at work sites	General Superintendent	While working in a specific area	Facility availability	
33.	Accommodation	DIIS	Where necessary overnight camp accommodation will be provided at worksites	General Superintendent	While working in a specific area	Facility availability	
34.	Removal	Project Requirement	All temporary infrastructure and wastes will be removed from the site on completion of construction works.	General Superintendent	After work is completed	Infrastructure and waste removed	
Trench construction							
35.	Infrastructure	Project Requirement	Existing buried infrastructure including pipelines, communication cables, and electrical supplies will be identified and protection measures applied.	General Superintendent	Prior to working in a specific area	Sites identified	
36.	Road and rail crossings	DIIS	Crossings of sealed roads and rail lines will not use open trench techniques.	General Superintendent	During trenching	Crossing inspections	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
37.	Vegetation clearance	APIA Code	Vegetation clearance will be minimised. Weeds will be marked for identification. Weed removal guidelines for the particular weed species will be followed to prevent spread into the cleared areas. Clearing activities will be scheduled to minimise the time between initial clearing and rehabilitation. Clearing will aim to retain the maximum amount of vegetation root stock within the pipeline construction area.	General Superintendent	During construction works	Inspections	
38.	Fencing	DIIS	Work areas will be fenced off where necessary to ensure that livestock and people do not access work areas.	General Superintendent	During construction works	Inspection inspections	
39.	Trenching procedures	Project Requirement EPBC 24	Trenching procedures and processes should follow the guidelines in Table 1. A typical arrangement of a construction layout for a trenching operation is shown in Figures 1 and 2. Disturbance to <i>Xanthorrhoea aff. bracteata</i> by will be avoided by boring under the dunes where it is located.	General Superintendent	During trenching	Trenching records	
40.	Trench dewatering	Project Requirement APIA Code	If water accumulates in an excavated trench from storm events or release from underground water sources (springs or watertable), the water may be pumped from the trench in accordance with the guidelines in Table 2. Prior to discharge <i>BBA-FRM-1000-1400-0001 internal permit to discharge from pond</i> must be signed by the Site Environmental Officer and a copy given to pump operator.	General Superintendent	During trenching	Dewatering records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
Water crossings							
41.	Boundaries marked	Project Requirement	All working boundaries shall be clearly marked, including extra working areas required for the approach slopes and works within the watercourse crossing.	General Superintendent	Prior to working in a specific area	Works areas delineated	
42.	Stream significance	Project Requirement	Determine whether a water crossing is a significant stream and/or has special monitoring requirements.	Environmental Manager	Prior to working in a specific area	Sites delineated	
43.	Complete stream diversions "in the dry"	Project Requirement APIA Code	Stream diversions should be completed as much as possible and rock protection and vegetation established before the stream is diverted into the new works.	Project Engineer	Ongoing	Construction Program	
44.	Avoid works in running water	Project Requirement APIA Code	Where works that may cause sediment disturbance cannot be done in the dry, avoid or minimise the amount of work to be done in running water by using temporary coffer dams, pumps, low flow pipes, etc to divert upstream flows away from the construction site.	General Superintendent	Ongoing	Inspection Records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
45.	Water quality monitoring	Project Requirement	Monitoring of water quality shall be carried out as follows: <ul style="list-style-type: none"> ▶ During construction, a minimum of three in-stream turbidity measurements shall be taken both upstream and downstream of the pipeline crossing point ▶ The timing shall coincide with specific in-stream construction events, such as diversion of stream flows during the placement and removal of dam and pumps; the initial release of water over the completed crossing and after significant rainfall events during and after construction. 	Environmental Manager	During trenching	Monitoring records	
46.	Photo record	Project Requirement	A photographic record of the watercourse crossing point shall be made prior to any works commencing and repeated during and after crossing work	Environmental Manager	Before during and after trenching	Photo records	
47.	Rain forecasts	Project Requirement APIA Code	The anticipated condition of rivers and streams during the following 24 hour period prior to commencing stream crossing activities shall be determined.	General Superintendent	Prior to working in a specific area	Forecast records	
48.	Dry periods only	Project Requirement APIA Code	Construction shall only occur during dry periods, and when there has been no immediate rain in the upstream catchment area of the water course	General Superintendent	Prior to working in a specific area	Stream flow observation records	
49.	Limit clearing	Project Requirement APIA Code	In any circumstance, limit the clearing of riparian (riverbank) vegetation to an absolute minimum required.	General Superintendent	During trenching	Photo records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
50.	Limit disturbance	Project Requirement APIA Code	Crossings will be designed to minimise erosion and sediment release to waterways. Only disturb the easement in the immediate vicinity of the stream immediately before installing the crossing.	General Superintendent	During trenching	Photo records	
51.	Minimum delay	Project Requirement	Avoid clearing of vegetation within 20 metres of the waterline, where a temporary vehicle watercourse crossing will be installed or where trenching will occur, until such time as the crossing is imminent.	General Superintendent	During trenching	Timing records	
52.	Large trees	Project Requirement APIA Code	Cut large riparian trees by chainsaw, and restrict root grubbing until the pipeline crossing is about to be carried out (trim trees using chainsaws rather than whole tree removal where possible).	General Superintendent	During trenching	Timing records	
53.	Falling trees	Project Requirement APIA Code	Fell trees away from the watercourse and immediately remove any substantial vegetation debris that falls in the watercourse.	General Superintendent	During trenching	Inspection records	
54.	Leave felled woody material if possible	LU1, Part 3, Sect 5, 5VG1.1, pg 155, (Seq pg 168) LU1, Part 3, Sect 6, 6VG1.1, pg 163, (Seq pg 176) LU3, Part 3, VG3.1, pg 32, (Seq pg 271) LU4, Part 3, VG3.1, pg 33, (Seq pg 322) TS1,16, pg 5, (Seq pg 423)	Unless conflicting with other requirements of the CEMP, minimise the removal of felled coarse woody material.	General Superintendent	Vegetation clearing	Inspection records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
55.	Machinery checks	Project Requirement APIA Code	Before being permitted on site, machinery and equipment shall be in good working order, with no machinery leaks, hydraulic hoses within service, and all vehicles over 3.5 tonnes shall carry a spill kit. Vehicles will be weed and disease free and vehicle hygiene measures will be undertaken prior to use of construction machinery in streams.	General Superintendent	During trenching	Inspection records	
56.	Refuelling	Project Requirement APIA Code	There shall be no refuelling adjacent to or over watercourses, and drips and spills shall be avoided by appropriate use of absorbent materials.	General Superintendent	During trenching	Inspection records	
57.	Vehicle crossings	Project Requirement APIA Code	<p>Vehicle crossings will be minimised where possible during construction. Existing crossing will be used where possible. Vehicle crossings will be scheduled during dry or low flow periods and will avoid sensitive sites. Crossings will be completed promptly to minimise impacts.</p> <p>Any temporary river crossings for vehicles shall be as follows:</p> <ul style="list-style-type: none"> ▶ made up of aggregate to a minimum thickness of 200 mm and with no fines, non-polluting aggregate or gravel ▶ pipes of appropriate sizing to allow water flow through the crossing ▶ removal of all materials following completion of works and rehabilitation to pre-construction condition. 	General Superintendent	During trenching	Inspection records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
58.	Trench plugs	Project Requirement	Mainline trenching activities shall be stopped short of a watercourse to prevent silty trench water from entering the watercourse, with hard trench plugs of a minimum width of three (3) metres left in place until the watercourse crossing has been initiated.	General Superintendent	During trenching	Inspection records	
59.	Minimum excavation depths	Project Requirement APIA Code	The depth of any excavations shall be the minimum required for safe access to the watercourse and for pipeline installation. Where extensive cuts are required, rock face and batter construction shall be assessed and directed by a competent Geotechnical Engineer before commencement of works to ensure appropriate stability of batters.	General Superintendent	During trenching	Investigation and inspection records	
60.	Removed vegetation	Project Requirement APIA Code	Place removed vegetation to provide for sediment control, return of seed branches or disposal.	General Superintendent	During trenching	Inspection records	
61.	Grade direction	Project Requirement	Grade the stripped surface away from the watercourse to reduce direct runoff from exposed areas to the waterway.	General Superintendent	During trenching	Inspection records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
62.	Stockpile locations	Project Requirement APIA Code LU1, Part 3, Sect 5, 5VG4.1, pg 155, (Seq pg 168) LU1, Part 3, Sect 6, 6VG4.1, pg 164, (Seq pg 177)	Place stockpiles (topsoil, cleared vegetation, quarry products, etc) away from the banks (a minimum of 10) metres from the waterline). Erect silt fences or containment berms around stockpiles to minimise loss due to erosion from wind or water. Stockpiling of soil, or other material associated with construction activities in relation to the wastewater pipeline activity, must not occur outside the pipeline construction corridors.	General Superintendent	During trenching	Inspection records	
63.	Don't mix materials	Project Requirement APIA Code	Do not mix topsoil from the banks with streambed material, and ensure topsoil and sub-soil materials are stockpiled separately.	General Superintendent	During trenching	Inspection records	
64.	Diversion drains	Project Requirement APIA Code	Temporary diversion drains along the top, at intermediate points down the slope and at the bottom of the approach slopes to watercourse immediately following clearing and grading.	General Superintendent	During trenching	Inspection records	
65.	Silt fences	Project Requirement APIA Code	Temporary silt fences at the outlet of diversion drains and near the base of slopes, including, where required, in-stream silt curtains around the base of the accessway or cutting.	General Superintendent	During trenching	Inspection records	
66.	Silt curtains	Project Requirement APIA Code	Where necessary to reduce suspended sediment in the upper water column, install in-stream floating silt curtains prior to commencement of the crossing.	General Superintendent	During trenching	Inspection records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
67.	Clear silt	Project Requirement APIA Code	Regular inspection and clearing of sediment from silt fences, especially after heavy rainfall and maintain until stream bank/bed restoration is complete.	General Superintendent	During trenching	Inspection and clearing records	
68.	Pipe work	Project Requirement APIA Code	Bending, welding, coating, testing and weighting of the pipe shall be completed prior to commencement of trenching within the watercourse.	General Superintendent	During trenching	Activity records	
69.	Prevent scouring	Project Requirement APIA Code	All pump discharge areas shall be protected from scouring.	General Superintendent	During trenching	Inspection records	
70.	Clean water	Project Requirement APIA Code	Clean stream water diverted during dam and pump operations shall be discharged downstream within the watercourse.	General Superintendent	During trenching	Inspection records	
71.	Silty water	Project Requirement APIA Code	Silty trench water shall be discharged from ditch pumps to a stable grassed area away from the watercourse and contained within a suitable sediment trap with scour protection.	General Superintendent	During trenching	Inspection records	
72.	Streambed material	Project Requirement APIA Code	Streambed material shall be stockpiled appropriately for subsequent replacement at the completion of backfill.	General Superintendent	During trenching	Inspection records	
73.	Blasting flyrock	Project Requirement APIA Code	Controls will be implemented to prevent blasting flyrock from damaging life, property and infrastructure	General Superintendent	During blasting	Inspection records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
74.	Blasting in streams	Project Requirement APIA Code	Blasting in-stream shall only be undertaken under dry conditions through the use of flow diversion techniques unless this is impractical. Where required, an on-site assessment by an ecologist appointed by BBA shall be carried out and any recommended mitigation measures to protect sensitive aquatic species and habitat shall be implemented.	General Superintendent	During blasting	Inspection records	
75.	Groundwater controls	Project Requirement APIA Code	Sub-surface drainage shall be installed to control groundwater movement, including: <ul style="list-style-type: none"> ▶ trench breakers at regular intervals on steep slopes and the approaches to watercourses to drain ground water seepage along the pipe trench to the surface; ▶ mark locations of trench breakers prior to backfilling; ▶ install trench breakers on each side of a wetland where the pipeline trench crosses and may drain the wetland. 	General Superintendent	During trenching	Inspection records	
Trench backfilling							
76.	Minimise delay	Project Requirement APIA Code	Trenches will be backfilled as soon as possible following pipe installation in accordance with the guidelines in Table 3.	General Superintendent	After trenching	Activity records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
77.	Rehabilitation of the stream bed and banks at temporary crossings	Project Requirement	Rehabilitate the creek bed and banks based on the soft engineering principles. Refer to OC0 02 Soil and Water Management.	General Superintendent	After trenching	Inspection Records	
78.	Easement revegetation	DIIS EPBC22,27	Disturbed areas will be revegetated as each 10 km of pipeline is constructed using endemic species sourced from local seed stock. Vegetation will be rehabilitation and the beach profile will be restored to its original shape within two months of completion of the onshore effluent pipeline. Disturbed areas will be revegetated to support existing land use but pipeline easements must remain free of medium and tall trees	General Superintendent	After trench backfilling	Inspection records	
79.	Stream crossing revegetation	Project Requirement APJA Code	All stream crossings shall be rehabilitated and revegetated, with the following of particular relevance: <ul style="list-style-type: none"> ▶ use of thick jute, pinning and rock scour protection ▶ planting through thick jute ▶ use of rushes, sedges, native grasses, riparian shrubs ▶ where site specific riparian species are required for revegetation they will be propagated using local provenance ▶ revegetation should be undertaken as soon as possible after clearing to prevent erosion and potential for weed spread. 	General Superintendent	After trenching	Inspection records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

Ref.	Subject	Reference	Control Activity	Responsibility	Timing	Performance Measure	Audit Check
80.	Marker posts	DIIS	Marker posts will be installed at regular intervals and registered with Dial-B-4-U-Dig.	General Superintendent	After trench backfilling	Markers in place	
Hydrostatic testing							
81.	Consultation	Project Requirement APIA Code	Appropriate consultation with landholders and other interested parties shall be carried out prior to commencement of activities and discharge of hydrostatic wastewater.	General Superintendent	Before testing	Consultation records	
82.	Standards	Project Requirement APIA Code	Testing operations shall be in accordance with AS 2885.5 (Pipelines – Gas and Liquid Petroleum – Field and Pressure Testing) and any other relevant standards and guidelines.	General Superintendent	During testing	Testing records	
83.	Avoid erosion	Project Requirement APIA Code	Control measures shall be implemented to ensure that the discharge of hydrostatic wastewater does not cause avoidable erosion or sedimentation.	General Superintendent	During testing	Inspection records	
84.	Chemical additives	Project Requirement APIA Code	The use of environmentally harmful corrosion inhibitors and other chemical additives in the hydrostatic test water will be avoided where possible. If additives are required, they will be low toxicity wherever practicable.	General Superintendent	During testing	Testing records	
85.	Recycle water	Project Requirement APIA Code	Test water with contained contaminants shall be recycled wherever possible for multiple testing of different sections of the pipeline.	General Superintendent	During testing	Testing records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

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86.	Reuse water	Project Requirement APIA Code	Wastewater shall only be discharged or reused for secondary uses such as agricultural irrigation or livestock watering where it complies with relevant water quality guidelines.	General Superintendent	During testing	Analytical records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

INCIDENTS							
87.	Potential environmental harm	CEMP incident response procedures	<p><i>Class 1: An actual adverse effect on the health or safety of human beings that is of a high impact or on a wide scale; an actual adverse effect on the environment that is of a high impact or on a wide scale; an actual loss or property damage of an amount, or amounts in aggregate, exceeding ten times the threshold amount (\$5,000); an environmental nuisance of a high impact or on a wide scale; an actual adverse effect on the health or safety of human beings that is not negligible; an actual adverse effect on the environment that is not negligible - cease relevant activities across all sites until the problem is fully understood and rectified; follow incident response procedures</i></p> <p><i>Class 2: The emission of a pollutant that unreasonably interferes with, or is likely to unreasonably interfere with, a person's enjoyment of the environment; any emission specified in an environment protection policy to be an environmental nuisance; an actual loss or property damage of an amount, or amounts in aggregate, exceeding the threshold amount (\$5,000) - cease relevant activities at the site of occurrence until the problem is rectified; follow incident response procedures</i></p>	Environmental Manager	Ongoing	Incident response records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

88.	Potential permit breach	CEMP incident response procedures	<p>Class A: <i>A permit condition has been breached and either the environmental consequences are significant or the breach is due to a wilful or negligent failure to attempt to satisfy the condition – cease relevant activities across all sites until the problem is fully understood and rectified; follow incident response procedures</i></p> <p>Class B: <i>A permit condition has been technically breached but the intent of the condition has been or will be achieved and environmental consequences of the breach are not significant – cease relevant activities at the site of occurrence until the problem rectified; follow incident response procedures</i></p> <p>Class C: <i>Compliance with the permit has been raised as an issue but the intent and requirements established by the permit condition have been met – examine the significance and potential for corrective action; follow incident response procedures</i></p>	Environmental Manager	Ongoing	Incident response records	
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EVALUATING PERFORMANCE

89.	Inspections	CEMP 16	Inspect the condition of protection and control measures and arrange maintenance, as required.	Site Environmental Officer	Daily	Weekly checklist	
90.	Photo record	Project Requirement	Assess and record (including photos at established photo points) areas disturbed during construction in regard to property specific requirements agreed with landowners.	Site Environmental Officer	Monthly	Inspection Records	
91.	Revegetation monitoring and maintenance – general areas	Project Requirement	Work site inspections will be undertaken at 3 month intervals for 2 years from completion of primary rehabilitation. Thereafter inspections will be every 6 months for 2 years, unless otherwise agreed with landowners. Remedial maintenance requirements will be based on defects identified in the monitoring inspection.	Environmental Manager during construction	Following revegetation, during monitoring period	Inspection and action records	

OPERATIONAL CONTROLS 09 TRENCHING AND PIPELINE INSTALLATION MANAGEMENT

92.	Revegetation monitoring and maintenance – highly unstable areas	Project Requirement	Monitoring of rehabilitated highly unstable areas shall be after significant rainfall events and at least each month in winter for 2 years from completion of primary rehabilitation activities, unless agreed otherwise with landowners.	Environmental Manager during construction	Following revegetation, during monitoring period	Inspection and action records	
93.	Reporting	CEMP 17	Report on the implementation of this EP in the environmental section of the monthly Project Report.	Environmental Manager	Ongoing	Monthly Report	
94.	Assess monitoring results	CEMP 19	Evaluate and assess monitoring results against specified targets.	Environmental Manager	Ongoing	Reports	
95.	Corrective action	CEMP 19	Take corrective action, where required.	Project Manager	As required	Action taken	

Erosion Control

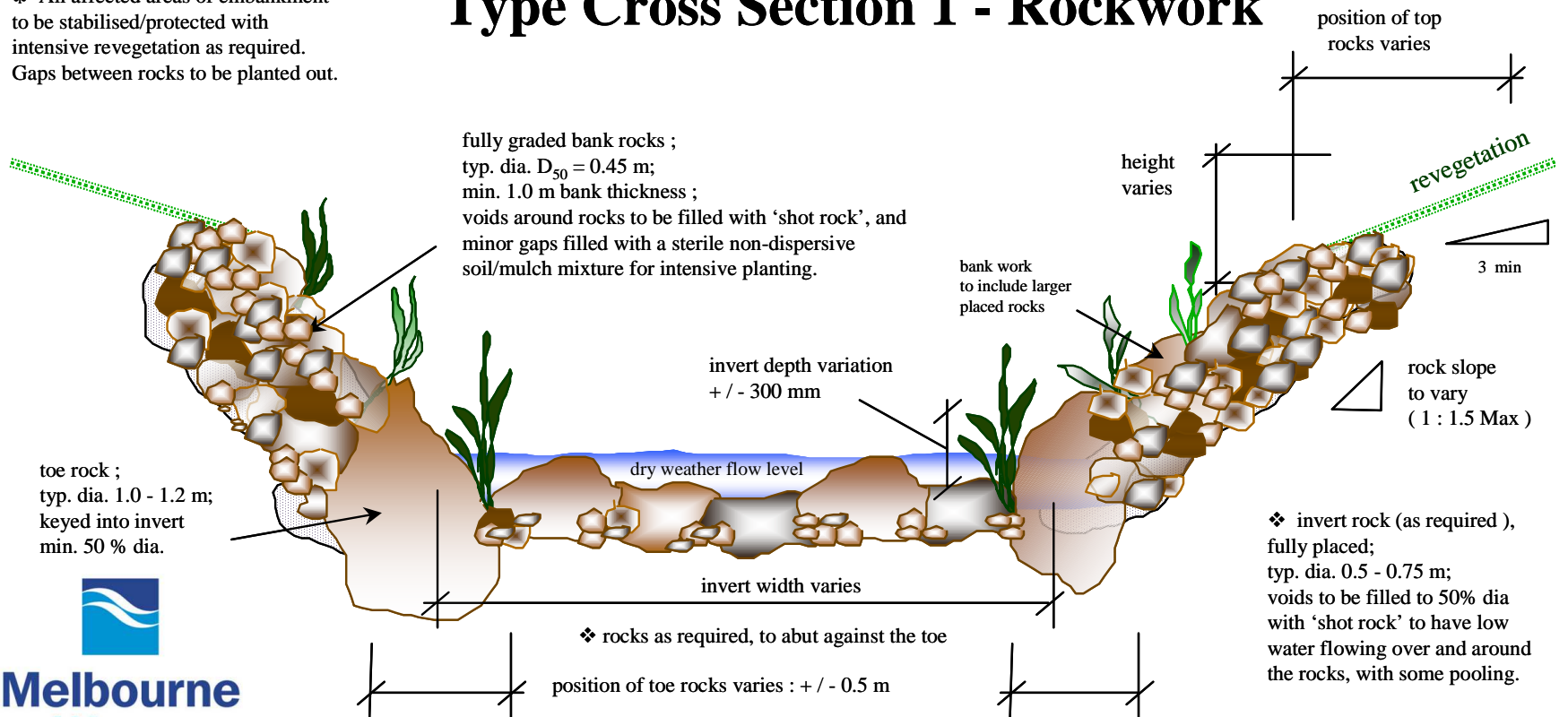
(Diagrammatic only,
Not to Scale)

BANK STABILISATION

Creek Re-Alignment Works

Type Cross Section 1 - Rockwork

♣ All affected areas of embankment to be stabilised/protected with intensive revegetation as required. Gaps between rocks to be planted out.



Note : rockwork to include a range of rocks within the specified typical diameters.

Table 1: Trenching guidelines

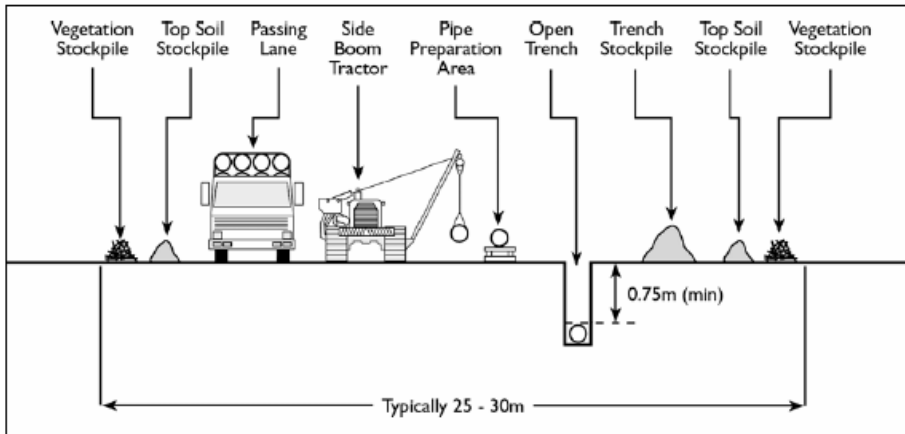
Subject	Guidance
Timing	Trenches will be backfilled as soon as possible following pipeline installation
Acid sulphate soils	Trenching activities will utilise existing soil maps and field surveys to identify those areas where there is a high potential to intercept acid sulphate soils Note: further evaluation may be required through sub-surface exploration to further determine the presence of acid sulphate soils or potential acid sulphate soils where necessary. Additionally, consultation with DTAE will be required if any material of this nature is discovered as permits may be required for their management if they are removed offsite.
Subsidence	Material used for backfilling will be compacted to reduce subsidence
Fauna	Adopt measures to prevent fauna entrapment within the pipeline trench such as construction of trench plugs with slopes no greater than 50% to provide ramps, and block off pipe ends at night
Layering	Soil horizons will be returned in the reverse order in which they were removed to avoid inversion (i.e. no subsoil on top of topsoil) of the soil profiles.
Final landform	The final landform will be consistent with the surrounding environment; no crown or camber will be installed on agricultural land
Erosion control	Following the cessation of trenching activities install and maintain ongoing erosion control measures
Water diversion	The construction of diversion berms for the final restoration process may be required to effectively divert water away from the easement
Aboriginal and Historic Heritage Values	Undertake visual inspection during construction of the trench for unknown historical or aboriginal heritage values.

Table 2: Trench dewatering guidelines

Subject	Guidance
Good quality water	If the water is of good quality and a relatively small quantity, it should be pumped onto the construction easement and allowed to infiltrate away from the trenchline.
Discoloured water	If the water is discoloured by suspended sediment it must pass through a sediment trap such as a weed-free, straw bale pond with an incorporated geotextile liner.
Adjoining land	If the volume of trench water is large, or a significant ground water source has been intercepted, then precautions will be taken to avoid environmental problems on land outside the easement such as water flow dissipaters.
Landowner approval	Landowner approval is required for discharging water onto land adjacent to the easement and generally it should be directed to the nearest watercourse or farm drain.

Table 3: Trench backfilling guidelines

Subject	Guidance
Fauna	Check for fauna prior to backfill and remove any trapped animals
Soil layers	Return soil layers in their original order and to original compaction density. Do not invert soil layers.
Riverbed depth	Replace original riverbed material on the riverbed to a depth equivalent to the original conditions.
Muds and organics	Keep surface organic and soft muds separated from sub-surface materials for later replacement as surface layers.
Cobbles and gravel	Where the streambed consists of large cobbles and coarse gravel overlaying finer material, separately stockpile the cobbles and coarse gravel to ensure restoration to an similar depth during backfill operation.
River bed structures	Rocks and other biophysical river bed structures will be replaced as component of riverbed restoration.
Debris	Large boulders, stumps, logs and other debris removed from the riverbed may be used in erosion control and or habitat restoration during rehabilitation.
Erosion prevention	Backfilled soils shall be compacted to a level consistent with the surrounding soils with the aim of preventing trench subsidence. Prevent erosion in backfilled trench by appropriate means such as trench blocks and/or compaction of backfilled soils



Typical construction corridor layout. Source: Australian Pipeline Industry Association Ltd

Typical pipeline construction corridor for a small transmission pipeline (200 mm diameter). Note the separate stockpiles for topsoil and excavated trench material. Source: Australian Pipeline Industry Association Ltd (2005) p. 16

Definitions

Access Track – a properly constructed temporary road to provide access to an area not serviced by existing roads or tracks, and which will be rehabilitated once work has been completed.

Acid sulphate soil – is any soil, sediment, unconsolidated geological material or disturbed rock mass which contains metal sulphides exceeding the criteria for acid sulphate soils specified in the EPA Information Bulletin 655 – Acid Sulphate Soil and Rock (1999).

Erosion control berms – utilise a small excavation (typically 40 – 50 cm deep) in conjunction with the excavated material as temporary means of controlling erosion and sediment runoff. The excavated material is placed on the downslope side across disturbed areas.

Geotextiles – are temporary erosion control materials and include erosion control mats, organic blankets, geosynthetic blankets, weed control blankets and mats, reinforced blankets, material which can be ‘sprayed on’ and sediment filters.

Potential acid sulphate soil – is a soil with the potential to generate acidic conditions when exposed to air but are stable in their reducing (oxygen poor) natural environment.

Riparian vegetation – is the vegetation along the edge of a watercourse. Riparian vegetation has an important role in filtering surface run-off and maintaining bank stability.

Sedimentation – the settlement and accumulation of sediment following erosion and dispersion by wind and water, including direct runoff and suspended sediment in the water column which can settle out, potentially smothering plants, and aquatic fauna in the streambed, or soil on land

Sediment traps – are structures designed to slow the movement of or hold sediment laden waters to allow suspended sediment particles to be deposited allowing the release of clear water from the outflow.

Silt fences – are lengths of synthetic geotextile material fastened to wooden or metal stakes often in a ‘U – shaped’ arrangement and tied into the ground by excavating and burying the lower part of the material to prevent under-scouring and erosion.

Wastewater – in this context relates to water used to pressurise pipelines for hydrostatic testing, and leaked wastewater from the plant being discharged

Revision Status

Revision	Date	Revision Description	Prepared	Reviewed	Approved
A0	27 April 2007	Draft for BBA review	IW		
A1	9 May 2007	Draft for DTAE review	IW		
B0	22 October 2007	Revised for submission to DTAE following auditor's comments	IW	JD	JC
B3	7 Jan 2008	Revised following DTAE comments	IW	JD	JC
B4	30 Jan 2008	Revised to include inspection frequency	JRD	JD	CF