

## Clyde Terminal Conversion Project – Environmental Management Strategy Biodiversity Management Plan

<b>Biodiversity</b>					
<b>Document Control</b>	<b>Revision</b>	<b>Date</b>	<b>Description</b>	<b>Author</b>	<b>Approved</b>
	4	30/11/2016	Revised to reflect contractual arrangements for construction. Acronym “PC” refers to “Principal Contractor”	JS/SL	JS
<b>Background</b>	This Biodiversity Management Plan (BMP) is one of the Environmental Plans under the Environmental Management Strategy for the Clyde Terminal Conversion Project.				
<b>Objectives</b>	<ul style="list-style-type: none"> <li>Identify potential adverse impacts on ecology, specifically on threatened flora and fauna, endangered ecological communities (EECs) and aquatic habitats and minimise and manage all impacts on ecology through the demolition and construction phases of the Project.</li> <li>Ensure compliance with relevant legislative and other requirements including the Development Consent (DC) conditions, mitigation measures in the Environmental Impact Statement (EIS) and Response to Submissions (RTS) Report.</li> </ul>				
<b>Performance Criteria</b>	<ul style="list-style-type: none"> <li>No degradation of Green and Golden Bell Frog (GGBF) habitat, <i>Acacia pubescens</i> (Downy Wattle) and <i>Wilsonia backhousei</i> (Narrow-leaf <i>Wilsonia</i>) in the remnant wetland through direct or indirect impacts of the demolition and construction.</li> <li>No adverse water releases to the wetland from demolition or construction.</li> <li>No increase in weed infestation resulting from demolition and construction phases of the Development.</li> </ul>				
<b>Key Performance Indicators</b>	<ul style="list-style-type: none"> <li>No deaths of GGBF, <i>Acacia pubescens</i> (Downy Wattle) and <i>Wilsonia backhousei</i> (Narrow-leaf <i>Wilsonia</i>) resulting from the demolition and construction. No mechanical damage to or removal of the remnant wetland arising from demolition /construction works.</li> <li>No non-compliance of EPL 570 water limit conditions caused by demolition or construction activities.</li> <li>No incidents of new weed infestations in the demolition and construction areas of control.</li> </ul>				

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### Biodiversity Management Plan

Biodiversity	
<b>Legislative Requirements</b>	<b>Development Consent SSD 5147 [14 January 2015]</b>
Biodiversity Management Plan	<p>C58. The Applicant shall prepare and implement a Biodiversity Management Plan for the Development to the satisfaction of the Secretary. This plan must:</p> <ul style="list-style-type: none"> <li>(a) be prepared in consultation with Council and OEH and Commonwealth Department of the Environment;</li> <li>(b) be approved by the Secretary prior to the commencement of construction or demolition;</li> <li>(c) include measures to be taken to minimise impacts on flora and fauna, including inspection of exterior casings and insulations on stacks and buildings to be demolished for the presence of Grey-headed Flying-foxes and microbats and procedures for their safe relocation;</li> <li>(d) an updated Plan of Management: Restoration of Green and Golden Bell Frog Habitat, Clyde, October 2013 for the construction, demolition and operation, including: <ul style="list-style-type: none"> <li>• specific measures to be implemented such as frog-proof fences to exclude Green and Golden Bell Frogs from construction and demolition areas;</li> <li>• plans for the implementation and ongoing management of artificial breeding habitats;</li> <li>• monitoring protocols including long-term low frequency frog monitoring and a Gambusia monitoring program of the ponds and artificial breeding habitats;</li> <li>• active management procedures for ensuring ponds remain free of Gambusia including manually drying out small and intermediate ponds on an annual basis;</li> </ul> </li> <li>(e) an updated Wetland Management Plan to include the creation of habitat opportunities for the Green and Golden Bell Frog; and</li> <li>(f) a pest, vermin and noxious weed management plan.</li> </ul>
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Any demolition and construction works that involve vegetation clearing.</li> <li>• Any works that involve demolition of infrastructure that is identified as potential GGBF habitat such as Tankfarm E1, Tankfarm B, Tank 52 and Mobil Tankfarm.</li> <li>• Modification works as part of management of the local GGBF population for the north-eastern wetland.</li> <li>• Works that generate dust and contribute to soil erosion.</li> </ul>
<b>Predicted Impacts</b>	<ul style="list-style-type: none"> <li>• The proposed demolition and construction works will not involve significant vegetation clearing. It is possible that occasional trees or shrubs may however be impacted due to their proximity to buildings and structures that will be demolished. However, any such clearing or root damage of retained vegetation will only be minimal and does not include any significant flora species, and will not lead to increased fragmentation of vegetation communities within the locality.</li> <li>• The demolition and construction activities have the potential to generate dust and sediment runoff impacting on surface water quality at the Site. It is anticipated that the management measures outlined in this BMP, the <b>Soil and Water Management Plan</b> (SWMP, refer to <b>Appendix D-2</b>) will adequately mitigate any such impacts to a negligible level.</li> <li>• The Development will involve improvements to existing drainage and wastewater treatment systems, and is therefore not anticipated to impact water quality in the vicinity of the Site, or for the Duck and Parramatta River catchments.</li> <li>• It is considered that the Development will not have a significant effect on the GGBF, Microbats, Grey-headed Flying Fox or any other flora and fauna or communities in the vicinity of the Site. Any impacts to species and communities can be adequately managed through the implementation of mitigation measures as outlined in this BMP.</li> </ul>

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Biodiversity	
<b>Sensitive Receivers</b>	<ul style="list-style-type: none"><li>• The boundary of the Site fringes the Duck and Parramatta Rivers.</li><li>• The Green and Golden Bell Frog (<i>Litoria aurea</i>) has been previously identified within the Site.</li><li>• The Grey-headed Flying Fox (<i>Pteropus poliocephalus</i>) has been previously sighted in the locality.</li><li>• The Downy Wattle (<i>Acacia pubescens</i>) is known from the remnant wetland in the north-east of the Project Area, however, would not be directly affected by the proposed demolition and ongoing operational activities of the Project.</li><li>• The Narrow-leafed <i>Wilsonia</i> (<i>Wilsonia backhousei</i>) species occurs within the intermittent areas of saltmarsh along the foreshore fringing the Project Area, however the species would therefore not be directly impacted on by the Project.</li><li>• There is also potential for parts of the Site to provide suitable habitat for microbat species.</li><li>• <b>Figure D-7A</b> illustrates the potential GGBF habitat areas</li></ul>

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### Biodiversity Management Plan

<b>Biodiversity - Mitigation Measures</b>							
Plan Reference	Source Reference	Aspect	Mitigation Measure	Implementation Responsibility			Frequency
				Construction		Demolition	
				Viva Energy as PC	Contractor as PC	Contractor as PC	
BMP1	C58 (d) C58 (e) EIS, E4 EIS, E5 EIS, E6 EIS, E7 EIS, E8	GGBF	Implement the <i>Plan of Management GGBF Clyde</i> (White, October 2013) or updated approved version.	Viva Energy Clyde Terminal Conversion Project Manager			Ongoing, as required.
BMP2	EIS, E2 EIS, E3 EIS, E9	GGBF	A suitably qualified herpetologist or suitably qualified ecologist shall design and implement a pre-works survey to identify and, if necessary, relocate frogs found within the footprint of demolition and construction.	Viva Energy Clyde Terminal Conversion Project Manager			Prior to demolition & construction works commencing
BMP3	EIS, E10 Plan of Management GGBF: Section 6.4	GGBF	Site inductions will include awareness of GGBF, identifying GGBF and what to do if a GGBF is found during the Works. All workers to complete the Viva Energy inductions (or approved equivalent) prior to undertaking works at the Site.	Construction Project Managers	Saunders Project Manager	Liberty Industrial Project Manager	Ongoing, as required.
BMP4	EIS E10 Plan of Management GGBF: Section 6.4	GGBF	Viva Energy to provide Contractors with content for toolbox talks to provide reminders about frog hygiene procedures and instructions on what to do if workers encounter a frog.	Viva Energy Clyde Terminal Conversion Project Manager			Ongoing, as required.
BMP5	EIS E3 Plan of Management GGBF: Section 6.4	GGBF awareness	The site supervisors and at least one other overseer will be inducted by the Project Herpetologist or suitably qualified ecologist on the Frog Hygiene Protocol (DECC, 2001), frog handling techniques, procedures for the erection and daily checking of the frog fences, monitoring of the wheel wash and other sterilisation procedures to be adopted for vehicles accessing the wetlands on site to ensure that all personnel and equipment are utilising these practices correctly.	Wetlands Contractor	N/A	N/A	Prior to commencement of wetlands works

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<b>Biodiversity - Mitigation Measures</b>							
Plan Reference	Source Reference	Aspect	Mitigation Measure	Implementation Responsibility			
				Construction		Demolition	Frequency
				Viva Energy as PC	Contractor as PC	Contractor as PC	
BMP6	EIS E10 Plan of Management GGBF: Section 6.3	Vehicles and machinery entering the wetlands impacting GGBF	The entry point for the wetlands during wetland works will contain a wheel wash area with a 10% bleach solution to prevent a disease caused by a <i>Chytrid</i> fungus infecting GGBF that may be conveyed to the wetlands.  This entry point will demarcate a sterile-site boundary and information signs will be erected to prevent vehicles, people or machinery that have not been disinfected from entering the wetlands.  Pump packs will be available for workers to spray their boots and other equipment before coming onto the wetlands.	Wetlands Contractor	N/A	N/A	At all times
BMP7	EIS, E20 EIS, E26	Vehicles and machinery entering the Site impacting weed management	Earth-working equipment and vehicles relating to wetland works will be cleaned of excess soil by brushing and/or hosing at the start and finish of works to minimise the risk of spreading of weed seeds and plant pathogens.	Wetlands Contractor	N/A	N/A	When earth-working equipment and vehicles enter and leave the wetlands.
BMP8	EIS, E12	Vegetation clearing	The <b>Demolition Works Plan</b> (refer to <b>Appendix D-1</b> ) will minimise the demolition footprint and the requirement for clearing of native vegetation wherever possible and within reason given the need to minimise fire hazard risks onsite.	N/A	N/A	Liberty Industrial Project Manager	Ongoing, as required
BMP9	EIS, E17	Vegetation clearing	In the event of changes to the proposed demolition / construction footprint such that works will encroach into more densely vegetated areas or vegetation removal in areas shown on <b>Figure D-7A</b> : <ul style="list-style-type: none"> <li>A suitably qualified ecologist will be engaged to conduct pre-clearance surveys of the final footprint immediately prior to demolition commencing; and,</li> <li>A suitably qualified ecologist will be engaged to undertake additional impact assessment if required.</li> </ul>	Viva Energy Clyde Terminal Conversion Project Manager			If required, prior to demolition of new areas following changes to footprint

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Plan Reference	Source Reference	Aspect	Mitigation Measure	Implementation Responsibility				
				Construction		Demolition		Frequency
				Viva Energy as PC	Contractor as PC	Contractor as PC	Contractor as PC	
BMP10	RTS - Section 2.10 Submission from PCC - Tree Removal	Tree removal	Advise Parramatta City Council of removal of native trees over 5m high.	Viva Energy Clyde Terminal Conversion Project Manager			1 week prior to removal	
BMP11	EIS, E13	Restricted zones	Establish clearly delineated boundaries between the designated construction sites and restricted zones including vegetation that is to be retained. Refer to <b>Figure D-7A</b> . This may include signage, barrier fencing and tree guards, as appropriate. No storage of soil, building materials, tools, paints, fuel or contaminants, etc. within the no-go areas.	Viva Energy Clyde Terminal Conversion Project Manager			Prior to commencement of demolition and construction	
BMP12	EIS, E16	Vegetation	If any damage occurs to vegetation beyond the Site, appropriate remediation strategies will be developed and implemented.	Viva Energy Clyde Terminal Conversion Project Manager			Ongoing	
BMP13	EIS, E14	Flora	Australian Standard 4970 (AS4970) for the protection of trees on development sites will be adopted to reduce the impact of incursions into the root zone of trees to be retained.	Viva Energy Clyde Terminal Conversion Project Manager			At all times	
BMP14	Plan of Management GGBF: Section 6.4	GGBF	A pre-work check of vehicles and equipment working in the wetlands will be undertaken to ensure that any GGBFs have not inadvertently entered the work area and sheltered in machinery or under equipment.	Wetlands Contractor	N/A	N/A	Daily	
BMP15	Plan of Management GGBF: Section 6.4	GGBF	Any frog fences in place will be checked daily during wetland works and if they are found to be damaged, work may cease in that area until the fence is repaired and new frog clearance surveys are carried out.	Wetlands Contractor	N/A	N/A	Daily, each morning prior to works commencing	
BMP16	Plan of Management GGBF: Section 6.4	GGBF	Viva Energy must be immediately advised if a GGBF is found whilst executing the Works. Only staff trained on frog handling techniques are authorised to handle the frogs to relocate them to the pet packs kept on site.	Construction Project Managers	Saunders Project Manager	Liberty Industrial Project Manager	Upon identifying a GGBF	

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Biodiversity - Mitigation Measures							
Plan Reference	Source Reference	Aspect	Mitigation Measure	Implementation Responsibility			
				Construction		Demolition	Frequency
				Viva Energy as PC	Contractor as PC	Contractor as PC	
BMP17	Plan of Management GGBF: Section 6.4	GGBF	Viva Energy will contact a Herpetologist/ accredited ecologist if any GGBF are found. The Herpetologist/accredited ecologist will then assess the frog to determine appropriate course of action (eg relocate to refuge or provide veterinary treatment).	Viva Energy Clyde Terminal Conversion Project Manager			Upon being notified of a GGBF
BMP18	EIS, E3	GGBF	Any frogs found will be relocated in accordance with the <i>Plan of Management GGBF Clyde</i> (White, October 2013) or updated approved version, by appropriately trained personnel adopting the Frog Hygiene Protocol (Department of Environment and Climate Change, 2008d). This will not require licensing for translocation of threatened species under the NSW TSC Act.	Viva Energy Clyde Terminal Conversion Project Manager			Prior to demolition and construction works commencing
BMP19	EIS, E11 C58 (c)	Microbat species and grey headed flying fox	A qualified ecologist will inspect exterior casings and insulations on stacks (i.e. potential habitat where microbats have historically been observed) and other buildings identified for demolition for signs of microbat occurrence and grey-headed flying fox.	Viva Energy Clyde Terminal Conversion Project Manager			Prior to demolition of stacks and other buildings
BMP20	EIS, E15	Flora	Ongoing bush regeneration in and around the vicinity of the Site will continue. Ongoing wetlands flora management will be conducted in accordance with the <i>Wetlands Management Plan</i> .	Viva Energy Clyde Terminal Conversion Project Manager			Ongoing
BMP21	EIS, E18 EIS, E35 EIS, LV2	Riparian vegetation	The riparian vegetation along the southern and eastern borders of the Site will continue to be preserved.	Viva Energy Clyde Terminal Conversion Project Manager			At all times
BMP22	C59 (f) EIS, E19	Weed management	Any weed infestations found within the Site will be removed prior to works commencing, and controlled through the Works period.	Viva Energy Clyde Terminal Conversion Project Manager			As required.
BMP23	C59 (f) EIS, E21	Exposed soil impacting weed management	Sediment fences and sediment traps will be installed as necessary in accordance with the <b>Soil and Water Management Plan</b> (refer to <b>Appendix D-2</b> )	Construction Project Managers	Saunders Project Manager	Liberty Industrial Project Manager	As required

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				Construction		Demolition	Frequency
				Viva Energy as PC	Contractor as PC	Contractor as PC	
BMP24	C59 (f) EIS, E22 EIS, E26	Exposed soil impacting weed management	Any soil and vegetation removed offsite will be covered during transport and taken to approved disposal sites to minimise the risks of spreading weeds and pathogens beyond the work sites.	Viva Energy Clyde Terminal Conversion Project Manager			At all times
BMP25	C59 (f) EIS, E23 EIS, E26	Waste disposal for weed management	Weeds (including vegetation, fruit and seed) removed during clearance will be disposed at an approved green waste site. Weed seed heads or flowers should be carefully removed and bagged on site following removal before appropriate disposal.	Viva Energy Clyde Terminal Conversion Project Manager			At all times
BMP26	EIS, E28	Waste impact on aquatic environments	Demolition and construction waste will be managed in accordance with the <b>Waste and Resource Recovery Management Plan (Appendix D-6)</b> .	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
BMP27	EIS, E29	Dust and runoff impact on aquatic environments	Dust suppression and sediment runoff prevention will be undertaken during the demolition and construction works in accordance with the <b>Soil and Water Management Plan (Appendix D-2)</b> .	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
BMP28	EIS, E30 EIS, E35	Wastewater impact on aquatic environments	Wastewater that has been potentially contaminated will be managed in accordance with the <b>Soil and Water Management Plan (Appendix D-2)</b> .	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times



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<b>Biodiversity - Mitigation Measures</b>							
Plan Reference	Source Reference	Aspect	Mitigation Measure	Implementation Responsibility			
				Construction		Demolition	Frequency
				Viva Energy as PC	Contractor as PC	Contractor as PC	
BMP29	EIS, E31 EIS, E35	Stormwater impact on aquatic environments	Temporary stormwater management measures (such as sandbags, sediment fences and berms) will be employed in accordance with the <b>Soil and Water Management Plan (Appendix D-2)</b> .	Construction Project Managers (requirements communicated via the Project HSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
BMP30	EIS, E32	Chemical pollutants impact on aquatic environments	Potential chemical pollutants (e.g. fuels, oils, lubricants, paints, herbicides, etc.) will be stored in accordance with the <b>Soil and Water Management Plan (Appendix D-2)</b> .	Construction Project Managers (requirements communicated via the Project HSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
BMP31	EIS, E34	Impact on biodiversity and aquatic environments from Acid Sulphate Soils	Manage ASS in accordance with the <b>Soil and Water Management Plan (Appendix D-2)</b> .	Construction Project Managers (requirements communicated via the Project HSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
BMP32	C59 (f)	Pest and vermin	Waste containers shall be provided at all work locations for domestic waste. Work areas shall be maintained in a neat and tidy condition, litter bins will be used at all times and regular emptying shall prevent the accumulation of litter on-site and attraction of pests and vermin.	Construction Project Managers (requirements communicated via the Project HSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times

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<b>Biodiversity - Monitoring Requirements</b>			
<b>Aspect</b>	<b>Description</b>	<b>Responsibility</b>	<b>Frequency</b>
GGBF	In accordance with the <i>Plan of Management GGBF Clyde</i> (White, October 2013) or updated approved version.	CTCP Manager	As required by <i>Plan of Management GGBF Clyde</i> (White, October 2013) or updated approved version.

<b>Biodiversity - Reporting Requirements</b>			
<b>Aspect</b>	<b>Description</b>	<b>Responsibility</b>	<b>Frequency</b>
Site inductions	Record kept of site inductions to confirm awareness of GGBF issues.  Record kept of inductions to Frog Hygiene Protocol (DECC, 2001)	Viva Energy Clyde Terminal Conversion Project Manager. Wetlands Contractor	At all times
Daily log	Records kept of pre-work check of vehicles and equipment working in the wetlands	Wetlands Contractor	Daily
Daily log	Records kept of check of integrity of frog fences and actions to rectify.	Wetlands Contractor	Daily
Monthly reports	Report to include: <ul style="list-style-type: none"> <li>- Detail of extent of vegetation clearing and fauna encounters</li> <li>- GGBF identifications and actions taken</li> <li>- Pre-works ecology surveys</li> </ul>	Viva Energy Clyde Terminal Conversion Project Manager. Wetlands Contractor	Monthly

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<b>Biodiversity - Corrective Action</b>			
<b>Aspect</b>	<b>Description</b>	<b>Responsibility</b>	<b>Frequency</b>
Unauthorised clearing, damage or breach of no-go areas	<ul style="list-style-type: none"> <li>• Investigate incident &amp; review current controls</li> <li>• Implement additional or alternative control methods</li> <li>• Review contractor compliance with management plans</li> </ul>	Viva Energy Clyde Terminal Conversion Project Manager.	As required
Non-compliance with EPL570 limits	<p>A corrective action will be undertaken should any of the following occur as a result of the Works:</p> <ul style="list-style-type: none"> <li>• Non-compliance raised;</li> <li>• Incident involving pollution of water or land has occurred; or</li> <li>• Pollution on land or water observed during works.</li> </ul>	Viva Energy Clyde Terminal Conversion Project Manager.	As applicable
GGBF deaths resulting from the demolition and construction	<ul style="list-style-type: none"> <li>• Review staff inductions and reiterate GGBF identification</li> <li>• Review reporting and handing of identified GGBF</li> </ul>	Viva Energy Clyde Terminal Conversion Project Manager.	As required

# Clyde Terminal Conversion Project – Environmental Management Strategy

## Biodiversity Management Plan

**Figure D-7A – Biodiversity - Sensitive Areas**



THE SHELL COMPANY OF AUSTRALIA

CLYDE TERMINAL CONVERSION  
DEMOLITION AND CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

BIODIVERSITY - SENSITIVE AREAS

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