Soil and Water Management					
Document Control	**Revision**	**Date**	**Description**	**Author**	**Approved**
	5	03/05/2018	Revised to include a site specific Erosion and Sediment Control Plan (Figure D-2B)	ES	JS
Background	This Soil and Water Management Plan (SWMP) is one of the Environmental Plans under the Environmental Management Strategy for the Clyde Terminal Conversion Project. It fulfils the requirements under the Development Consent (DC) conditions for the following plans: • Contamination Management Plan (C17); • Acid Sulphate Soils Management Plan (C20); • Erosion and Sediment Control Plan (C44); • Surface Water Management Plan and Groundwater Management Plan (C50);				
Objectives	• Minimise and manage impacts to soil and water throughout the demolition and construction phases of the Development; • Ensure compliance with relevant legislative and other requirements including the DC conditions, mitigation measures in the Environmental Impact Statement (EIS) and Response to Submissions (RTS) Report; and Environment Protection Licence (EPL) 570.				
Performance Criteria	• No concentrated overland flows onto adjacent properties; • Pollutant levels in discharged water are within the criteria contained in legislative and other requirements including DC, EIS and EPL 570.				
Key Performance Indicators	• No exceedance of water discharge limits in EPL 570 resulting from demolition and construction phases of the Project. • No environmental harm caused by hydrocarbon or chemical spills; • No prosecutions or Penalty Infringement Notices (PIN) associated with construction or demolition.				
Legislative Requirements	**Development Consent SSD 5147 [14 January 2015]**				
	Contamination Management Plan	C17. The Applicant shall prepare and implement a Contamination Management Plan for construction and demolition, to the satisfaction of the Secretary. The Plan shall: *(a)* be prepared by a suitably qualified and experienced expert; *(b)* be prepared in consultation with the EPA; *(c)* be approved by the Secretary prior to the commencement of construction or demolition; *(d)* identify all potential contaminants that could be disturbed, mobilised and discharged to receiving waters during construction and demolition; *(e)* detail the procedures for testing, classifying, handling, storing and disposing of contaminated soils and groundwater encountered in excavations; *(f)* detail measures for periodically testing surface water run-off that may accumulate in excavations, and the procedures for transfer of contaminated water to the on-site wastewater treatment plant; and *(g)* detail any required updates to the *Soil and Groundwater Management Plan Shell Clyde Refinery and Parramatta Terminal, Durham Street, Rosehill, 2010* to address construction and demolition.			

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	Removal of Sub-Grade Infrastructure	C18. The Applicant shall undertake any removal of underground petroleum storage tanks or other infrastructure in accordance with the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* or its latest version. C19. The Applicant shall provide a contamination report to the EPA detailing any site contamination investigation carried out in the immediate vicinity of any subgrade asset removal. This report shall be provided to the EPA on completion of the removal of sub-grade infrastructure.
	Acid Sulphate Soils Management Plan	C20. The Applicant shall prepare and implement an Acid Sulphate Soil Management Plan for construction and demolition in accordance with the NSW State Government's *Acid Sulphate Soils Manual 1998.*
	Imported Soil	C43. The Applicant shall: (a) ensure that only VENM or ENM or other material approved in writing by the EPA is used as fill on the Site; (b) keep accurate records of the volume and type of fill to be used; and (c) make these records available to the Department upon request.
	Erosion and Sediment Control Plan	C44. The Applicant shall prepare and implement an Erosion and Sediment Control Plan for construction and demolition works to the satisfaction of the Secretary and in accordance with Managing Urban Stormwater: Soils and Construction, 2004, or its latest version. C45. Prior to the commencement of construction and demolition works, the Applicant shall implement suitable erosion and sediment control measures on-site, in accordance with the Erosion and Sediment Control Plan.
	Discharge Limits	C46.The Development shall comply with section 120 of the Protection of the Environment Operations Act 1997, which prohibits the pollution of waters, except as expressly provided in an EPL. C47.The Applicant shall ensure that signs are displayed and maintained adjacent to all stormwater drains on the site clearly indicating 'Stormwater Only'.
	Foreshore Management	C48.The Applicant shall ensure the foreshore and inter-tidal areas on the site are fully protected for the duration of the construction and demolition works and site operation. This includes preventing the storage of any machinery, materials, equipment, supplies, or waste receptacles within or adjacent to the inter-tidal area.
	Bunding	C49. The Applicant shall store all chemicals, fuels and oils used on-site in appropriately bunded areas in accordance with the requirements of all relevant Australian Standards, and/or the EPA's *Storing and Handling of Liquids: Environmental Protection – Participants Handbook*.
	Water Management Plan	C50.The Applicant shall update and implement the Water Management Plan for the site for construction, demolition and operation, to the satisfaction of the Secretary. The plan must: (a) be approved by the Secretary prior to the commencement of construction or demolition and be provided to the EPA and NOW; (b) include mitigation measures for managing surface water and industrial water including, but not limited to the Management and Mitigation Measures in Appendix C; (c) include a Surface Water Management Plan, that: • describes the water management system on site, including plans of the stormwater system and oily water/wastewater system; and

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		• demonstrates compliance with any requirements of the EPL and/or Council with respect to stormwater and wastewater management. (d) include a Groundwater Management Plan, that: • details the procedures for testing, dewatering, storage, movement and treatment of any groundwater; • includes a copy of the water licences or approvals obtained for the interception of groundwater; and (e) include a Leachate Management Plan describing procedures for preventing the generation of leachate from waste stockpiles.
	Environment Protection Licence EPL 570 [21 May 2015]	
	2 Discharges to Air and Water and Applications to Land P1 Location of monitoring/discharge points and areas	Section P1 of the EPL provides the location and description of monitoring/discharge points and utilisation areas.
	3 Limit Conditions L1 Pollution of waters L2 Load limits L3 Concentration limits L4 Volume and mass limits L5 Waste	Section 3 of the EPL provides a number of limit conditions for discharging pollutants to receiving waters. The Development must comply with these limit conditions. • L5.10 After onsite treatment to reduce hydrocarbon contamination of soil or sediment to less than 1% on a weight basis, such treated waste may be disposed of onsite in the area marked “Treated Material Onsite Disposal Site (TPH < 1%)” as shown on drawing number CLR_0122667_0004 Rev E titled “Clyde Terminal EPL 570 Licenced discharge points."
	O5 Processes and management	• O5.4 Soil contaminated with hydrocarbons must be treated in the landfarm area as defined by the shaded area labelled “Landfarm” on drawing number CLR_0122667_0004 Rev E titled “Clyde Terminal, EPL No 570, Licenced Discharge Points." • O5.5 Treated soil contaminated with hydrocarbons must be disposed of in the disposal area as defined by the shaded area labelled “Treated Material Onsite Disposal Site (TPH < 1%)” on drawing number CLR_0122667_0004 titled “Clyde Terminal, EPL 570 Licence Discharge Points" or taken offsite to a place that can lawfully accept that class of waste.

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	O7 Other operating conditions	O7.1 Discharges to Duck River at Point 23, 24, and 25 must only be a result of dewatering from bunded areas in the tank farm or from water pressure testing of chemical storage tanks within the premises. O7.2 Discharges to Duck River at Point 27: (a) must only be a result of dewatering from bunded areas or from water pressure testing of chemical storage tanks within the western tank farms; and (b) The licensee must notify the EPA at least 7 days in advance of any discharge; and (c) The licensee must undertake water sampling of the subject chemical storage tank prior to any discharge and provide the laboratory results to the EPA.
	5 Monitoring and Recording Conditions M1 Monitoring records	M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition. M1.2 All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them. M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.
	M2 Requirement to monitor concentration of pollutants discharged	Section M2 of the EPL provides requirements for Viva Energy to monitoring concentration of certain pollutants discharged to receiving waters.
	M3 Testing methods - concentration limits	M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.
	M4 Testing methods - load limits	Note: Division 3 of the Protection of the Environment Operations (General) Regulation 2009 requires that monitoring of actual loads of assessable pollutants listed in L2.2 must be carried out in accordance with the relevant load calculation protocol set out for the fee-based activity classification listed in the Administrative Conditions of this licence.

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	M5 Recording of pollution complaints	M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies. M5.2 The record must include details of the following: (a) the date and time of the complaint; (b) the method by which the complaint was made; (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; (d) the nature of the complaint; (e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and (f) if no action was taken by the licensee, the reasons why no action was taken. M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made. M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.
	M7 Requirement to monitor volume or mass	Section M7 of the EPL provides volume/mass requirements for monitoring at each discharge point, to which Viva Energy must comply with.
Activities	The Development activities which are likely to cause impacts on soil and water include: • Any activities involving soil exposure or ground disturbance such as vegetation clearing and excavations; • Any activities involving handling, stockpiling, transportation and/or storage of spoil and waste materials; • Any activities involving chemical use and storage; • Any activities related to the north-eastern wetland; and • Any activities which impact existing stormwater systems and other on-site water treatment facilities. The demolition and construction components of the Development would only involve minimal excavation activities as follows: • Grading works within Tankfarms B, B1, and B2. Excavations required as part of these works would be undertaken to an maximum depth of around 0.6 metres below existing ground surface levels to re-establish the original floor orientation and drainage; and • Excavations to lay load-spreading concrete slabs for the new substations are expected to be to a depth of around 0.3m.	

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Predicted Impacts in the EIS	• Industrial water and stormwater from the Project Area are discharged either to Duck River or Parramatta River, to the remnant wetland, or via the trade waste water system under agreement with Sydney Water. Water captured in the tank bunds at the Project Area is generally stormwater, and is drained from the bunds as soon as possible to ensure the ability of those tank bunds to operate in the unlikely event of a tank spill. This stormwater is then diverted to the Accidentally Oily Contaminated (AOC) water systems. Water drained from storage tanks at the Clyde Terminal is diverted to the Continuously Oily Contaminated (COC) water systems. The water captured by both the AOC and COC systems undergoes primary treatment through waste water treatment facilities onsite. These have included both a biotreater and interceptor systems although post cessation of refining and site cleaning, the biotreater will be shut down as it will not be required. • Clean stormwater at the Clyde Terminal is diverted and discharged directly to Duck River at the existing discharged points regulated under EPL No. 570, or to the remnant wetland in the north-east of the Project Area. Any AOC stormwater (e.g. stormwater captured by the tank bunds) at the Clyde Terminal undergoes primary treatment before being discharged under EPL No. 570. Water discharge is undertaken as required (i.e. during stormwater events or once used process water has been treated and is ready for discharge). • The demolition of assets within the Project Area would not impact on the catchment and diversion of surface water to the existing water treatment facilities. • The Project is unlikely to involve the interception of groundwater. In the unlikely event that this is required, Shell will consult with NOW regarding the need for approval(s) under the Water Management Act. • Stormwater entering excavated areas will require removal. • As it is highly unlikely that any of the activities the Project will undertake would intercept groundwater at the Project Area, it is also anticipated that the Project would not result in saline intrusion of existing groundwater, and would not involve the construction of groundwater bores in addition to the existing groundwater monitoring bores on-site. The Project is therefore also not predicted to result in the sterilisation of any existing groundwater source or aquifer underlying the Project Area. • There is potential for the Project to intercept, disturb, or mobilise contaminated soils, including Acid Sulphate Soils (ASS). If not appropriately managed, this has the potential to impact both on-site and off-site receivers.

Soil and Water - Mitigation Measures							
Erosion and Sediment Control Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP1	C44 EIS, SW1 EIS, SG2 EIS, E27	Progressive erosion and sediment control plans	Contractors will prepare Progressive Erosion and Sediment Control Plans (PESCP) for each phase of their respective works to detail the implementation of measures to minimise erosion and movement of sediment due to demolition / construction works. PESCP will be prepared in accordance with Managing Urban Stormwater: Soils and Construction, 2004, or its latest version.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	Two weeks prior to commencement of construction works or change in works program
SWMP2	C44 EIS, SW1 EIS, SW3 EIS, SW5	Progressive erosion and sediment control plan review	PESCP will be prepared and updated in consultation between demolition / construction contractors and Viva Energy. They will be submitted to Viva Energy for review. These will be prepared and amended as required to meet changing conditions on the site and to address risk based activities such as, but not be limited to: • Temporary stormwater management measures (such as sandbags, sediment fences and berms) used to minimise the risks of sediment-laden runoff and other construction pollutants entering downstream systems. • Sediment traps employed at strategic locations if required to prevent runoff and ensure treatment of contaminated water as a result of increased industrial water usage for dust suppression. • Runoff generated outside of demolition and construction areas will be diverted away from these areas where possible to decrease the potential for contaminated runoff to migrate throughout the Project Area. • Where excavation activities are undertaken soil exposure would be minimised where possible and land disturbance would occur for the shortest time possible. • Prevention of infiltration and erosion of soils excavated, exposed and/or stockpiled by the use of geotextile liners or temporary capping. Prevention of downstream runoff from exposed areas by implementation of appropriate sediment control devices.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	Two weeks prior to commencement of construction works or change in works program

Soil and Water - Mitigation Measures							
Erosion and Sediment Control Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP3	C45	Erosion and sediment control	Erosion and sediment control measures will be implemented on-site, in accordance with the Clyde Terminal Site Specific Erosion and Sediment Control Plan (Figure D-2 B) and the Contractor's PESCP.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	As required

Soil and Water - Mitigation Measures							
Contaminated Soils Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP4	C18	Sub-grade infrastructure	Any removal of underground petroleum storage tanks or other infrastructure in accordance with the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* or its latest version.	Viva Energy Clyde Terminal Conversion Project Manager			As required
SWMP5	C19	Sub-grade infrastructure	A contamination report will be prepared to the satisfaction of the EPA detailing any site contamination investigation carried out in the immediate vicinity of any subgrade asset removal. This report shall be provided to the EPA on completion of the removal of sub-grade infrastructure.	Viva Energy Clyde Terminal Conversion Project Manager			On completion of the asset removal
SWMP6	C17 (d) C17 (e)	Contaminated soils	As soil is excavated it will be assessed for signs of contamination. Potential contaminants that could be encountered may be indicated by: - unnatural discolouring; - odorous; - potentially asbestos containing sheeting, fragments or fibrous insulation materials; or - the presence of other anthropogenic materials such as metallic waste, general refuse or building rubble. All excavated soils with signs of contamination will be subject to sampling and chemical analysis in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (*National Environment	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	At all times

Soil and Water - Mitigation Measures							
Contaminated Soils Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
			Protection Council (NEPC), 1999) (amended in 2013) to assess the soil quality and onsite reuse potential.				
SWMP7	C17 (d) C17 (e) EIS, SG4	Testing of excavated soil	Soils excavated and returned to the same location will be tested as detailed below in the testing methodology and can be returned prior to analytical results being returned. Soils excavated and reused in another location on site will be assessed for quality and reuse potential as detailed below in the testing methodology and agreed to with Viva Energy prior to replacement. **Soil Testing Methodology** *(National Environment Protection (Assessment of Site Contamination) Measure 1999 (National Environment Protection Council (NEPC), 1999) and associated Schedules (amended in 2013):* - collecting at least one sample per 25 m^3 of excavated soil, or at least one sample for each excavation, whichever is the lesser; - collecting samples that are representative of the excavated soil (e.g. collect samples throughout the stockpile, not just from the surface); - sending samples to a NATA accredited laboratory for analysis; - analysing each sample for a standard suite of chemicals including the following, but not limited to: • total recoverable/petroleum hydrocarbons • BTEXN (benzene, toluene, ethylbenzene, xylenes, naphthalene) • Priority metals (Chromium and Lead) • Polycyclic Aromatic Hydrocarbons • Asbestos • PCBs - comparing the concentrations of contaminants identified against the investigation levels and screening levels presented in the National Environment Protection (Assessment of Site Contamination) Measure 1999 (National Environment Protection Council (NEPC), 1999) and associated Schedules (amended in 2013). - suitable quality assurance / quality control procedures must be followed during any sampling event in accordance with National Environment Protection (Assessment of Site Contamination) Measure 1999 (National	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	At all times

Soil and Water - Mitigation Measures							
Contaminated Soils Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
			Environment Protection Council (NEPC), 1999) and associated Schedules (amended in 2013) Excavated soils that are not considered of suitable quality or reuse potential will be subjected to waste classification in the event that onsite treatment or offsite disposal is needed. Sampling and classification of waste soils will be undertaken in accordance with the Department of Environment, Climate Change and Water "Waste Classification Guidelines *Part 1 Classifying Waste", 2008 (DECCW 2008).				
SWMP8	EPL 570 O5.4 EIS, SG11	Contaminated soil	Following testing, soil contaminated with hydrocarbons will be treated in the land farm area as defined in EPL 570 or will be disposed of offsite. Once soil is in the land farm area, it will be managed in accordance with EPL 570.	Viva Energy Clyde Terminal Conversion Project Manager			At all times
SWMP9	C17 (e)	Contaminated soil	Following testing, contaminated soil that is unsuitable for reuse would be managed in accordance with the **Waste and Resource Recovery Plan** (**Appendix D-6**).	Viva Energy Clyde Terminal Conversion Project Manager			At all times
SWMP10	EIS, SG6	Occupational hygiene monitoring Volatile organic compounds (VOCs)	Identify any required occupational hygiene monitoring for demolition and construction personnel in relation to VOCs	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	At all times
SWMP11	EIS, SG43	Incident reporting	Spill incidents would be managed according to the process identified in Section 3.5 of the EMS.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	Ongoing, as required
SWMP12	EIS, SG44 - SG47	Release event assessment	Undertake soil and groundwater impact assessment as applicable under the SGMP 2010 if a release event is known or suspected to have occurred	Viva Energy Clyde Terminal Conversion Project Manager			As required

Soil and Water - Mitigation Measures							
Spoil Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP13	C43 (a)	Imported Soil	Imported soil used as fill on the Site will be only VENM or ENM or other material approved in writing by the EPA.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	At all times
SWMP14	C43 (a)	Imported Soil	If imported soil to be used on Site is not VENM or ENM then the Contractor will advise the Viva Energy Clyde Terminal Conversion Project Manager to coordinate the request for approval from EPA.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	One month prior to imported soil other than VENM or ENM being committed for use on the Site.
SWMP15	C43 (a)	Imported Soil	If imported soil to be used on Site is not VENM or ENM then the Viva Energy Clyde Terminal Conversion Project Manager will coordinate approval of EPA.	Viva Energy Clyde Terminal Conversion Project Manager			As required
SWMP16	C43 (b) C43 (c)	Imported Soil	Accurate records will be kept of the volume and type of imported fill to be used. These records will be kept in a manner such that they can be made available to the Department of Planning and Environment upon request.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	At all times
SWMP17	EIS, SW3	Dust	Dust will be managed in accordance with **Air Quality Management Plan** (**Appendix D-4**).	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times

Soil and Water - Mitigation Measures							
Spoil Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP18	EIS, SW3	Stockpiles	Stockpiles of excavated material will be clearly labelled, located away from trafficked areas and other potential disturbances, placed on geo-fabric lining to prevent leachate and erosion, kept to less than 5 metres tall, and allow adequate room for transport around and management of each stockpile.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times

Soil and Water - Mitigation Measures							
Water Management and Discharge				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP19	C46	Discharge	Discharge from the demolition and construction works that is directed to the Terminal wastewater treatment plant will not contribute or cause an exceedance of the EPL 570 discharge limits.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
SWMP20	C47	Stormwater drains	Display and maintain signs adjacent to all clean drains on the site clearly indicating 'Stormwater Only'. *Note: At the Clyde Terminal, 'stormwater only' drains are known as 'clean drains' on drainage plans as there are some stormwater drains that would allow for some accidentally oil contaminated flows.*	Viva Energy Clyde Terminal Conversion Project Manager			At all times
SWMP21	C48	Intertidal areas	The foreshore and inter-tidal areas on the Site will be fully protected for the duration of the demolition construction. No machinery, materials, equipment, supplies, or waste receptacles will be stored within or adjacent to the inter-tidal area. Ensure existing fence remains in place and is properly maintained.	Viva Energy Clyde Terminal Conversion Project Manager			At all times

Soil and Water - Mitigation Measures							
Water Management and Discharge				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP22	C49 EIS, SW6 EIS, SW9	Chemical, fuel and oil storage	All chemicals, fuels and oils used will be stored in appropriately bunded areas in accordance with the requirements of all relevant Australian Standards, and/or the EPA's *Storing and Handling of Liquids: Environmental Protection – Participants Handbook*.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
SWMP23	EIS, SW2	Storage of waste	Demolition and construction waste would be stored in accordance with the **Waste and Resource Recovery Plan** (**Appendix D-6**).	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
SWMP24	C17 (f) EIS, SW4	Wastewater management	Wastewater that has been potentially contaminated during the demolition and construction works would be managed in accordance with the **Waste and Resource Recovery Plan** (**Appendix D-6**).	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	Liberty Industrial Project Manager	At all times
SWMP25	EIS, SW14 EIS, E35	Development on riparian land	Infrastructure at the Site will be located outside of the riparian buffer zone along the southern and eastern borders of the Site.	Viva Energy Clyde Terminal Conversion Project Manager			At all times

Soil and Water - Mitigation Measures							
Groundwater Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP26	C50 (d)		Intersection of groundwater is not expected however in the event that it occurs works will cease in the area and immediately notify the Viva Energy Clyde Terminal Conversion Project Manager. Viva Energy will notify the NSW Office of Water, NSW EPA and Department of Planning and Environment (EPA) to determine the most effective approach to management of the issue.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	As required
SWMP27	C17 (f) C47 C50 (d) EIS, SG8	Discharge	Contractors will develop a Work Method Statement by a suitably qualified expert in consultation with Viva Energy to address the management of water from potential interception of groundwater or separated phase product (e.g. oil) in excavations and ingress of surface water into excavations. Discharge from the construction works will be directed to the Terminal wastewater treatment plant and will not contribute or cause an exceedance of the EPL 570 discharge limits. The Work Method Statements will address: • The use of geotextile liners or temporary capping to reduce infiltration of surface water runoff • an interim storage area, such as a settlement tank / holding pond, prior to transfer to the terminal wastewater treatment plant; • chemical analysis required prior to treatment in the wastewater treatment plant; and • the process for managing separated phase product from the surface of the water.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	Saunders Project Manager	N/A	Where required.
SWMP28	EIS, SG12 EIS, SG26	Additional investigations	Further investigations would be undertaken in areas that are currently unable to be accessed due to redundant refining plant and equipment on these areas, once the aboveground infrastructure is removed and access to the relevant areas is available.	Viva Energy Clyde Terminal Conversion Project Manager			Following completion of demolition

Soil and Water - Mitigation Measures							
Groundwater Management				**Implementation Responsibility**			
				Construction		**Demolition**	
Plan Reference	**Source Reference**	**Aspect**	**Mitigation Measure**	Viva Energy as PC	Contractor as PC	Contractor as PC	**Frequency**
SWMP29	EIS, SG21	Acid Sulphate Soils	Potential Acid Sulphate Soils (PASS) have been identified on **Figure D-2A**. PASS impacted soils will be identified within the Project Area before excavation activities are undertaken.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	N/A – testing confirms ASS not present in Contractor work area.	N/A	Prior to excavation activities
SWMP30	C20 EIS, SG20 EIS, SG22 EIS, SG23	Acid Sulphate Soils	Contractor will prepare a Work Method Statement for managing Acid Sulphate Soils in accordance with NSW State Government's Acid Sulphate Soils Manual 1998 in the event that they are encountered.	Construction Project Managers (requirements communicated via the Project HSSE Plan)	N/A	N/A	Prior to excavation activities

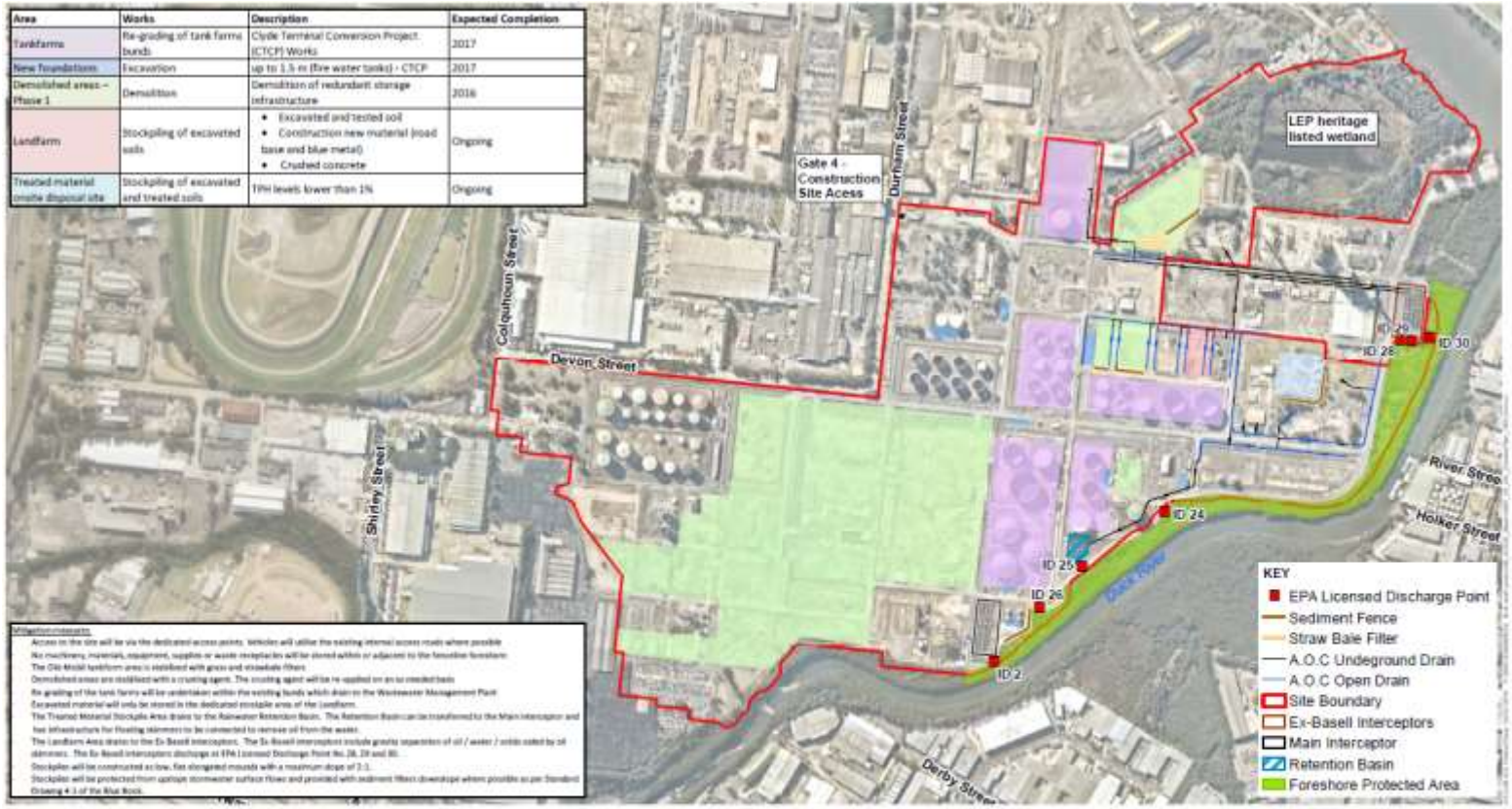
Soil and Water - Monitoring Requirements			
Aspect	**Description**	**Responsibility**	**Frequency**
Sediment laden water	Visual observations to ensure sediment laden water is managed properly and not discharged off-site.	Viva Energy Clyde Terminal Operations Manager	Ongoing
Pollutants in water for discharge [C8 (e)]	Monitoring requirements will be fulfilled as required in EPL 570.	Viva Energy Clyde Terminal Operations Manager	As required
Testing of excavated soil	In accordance with mitigation measure**SWMP7**.	Viva Energy Clyde Terminal Conversion Project Manager	As required
Testing of groundwater and surface water	In accordance with contractor developed groundwater and surface water management Work Method Statement.	Construction Project Managers (requirements communicated via the Project HSSE Plan) Saunders Project Manager	As required

Soil and Water – Reporting Requirements			
Aspect	**Description**	**Responsibility**	**Frequency**
Reporting	Monitoring requirements will be fulfilled as required in EPL 570	Viva Energy Clyde Terminal Operations Manager	As required.

Soil and Water - Corrective Action			
Aspect	**Description**	**Responsibility**	**Frequency**
Non-compliance with EPL570 limits	A corrective action will be undertaken should any of the following occur: • Non-compliance raised; • Incident involving pollution of water or land has occurred; or • Pollution on land or water observed during works.	Viva Energy Clyde Terminal Operations Manager	Ongoing, as required

Figure D-2 A – Potential Acid Sulphate Soils

Figure D-2 B – Clyde Terminal Erosion and Sediment Control Plan



Area	Works	Description	Expected Completion
Tankfarms	Re-grading of tank farms bunds	Clyde Terminal Conversion Project (CTCP) Works	2017
New Foundations	Excavation	up to 1.5 m (fire water tanks) - CTCP	2017
Demolished areas – Phase 1	Demolition	Demolition of redundant storage infrastructure	2016
Landfarm	Stockpiling of excavated soils	• Excavated and tested soil • Construction new material (road base and blue metal) • Crushed concrete	Ongoing
Treated material onsite disposal site	Stockpiling of excavated and treated soils	TPH levels lower than 1%	Ongoing

Mitigation measures

Access to the site will be via the dedicated access points. Vehicles will utilise the existing internal access roads where possible

No machinery, materials, equipment, supplies or waste receptacles will be stored within or adjacent to the foreshore foreshore.

The Old Mobil landform area is stabilised with grass and strawbale filters

Demolished areas are stabilised with a crusting agent. The crusting agent will be re-applied on an as needed basis

Re-grading of the tank farms will be undertaken within the existing bunds which drain to the Wastewater Management Plant

Excavated material will only be stored in the dedicated stockpile areas of the Landfarm.

The Treated Material Stockpile Area drains to the Rainwater Retention Basin. The Retention Basin can be transformed to the Main Interceptor and has infrastructure for floating skimmers to be connected to remove oil from the water.

The Landfarm Area drains to the Ex-Basell interceptors. The Ex-Basell interceptors include gravity separators of oil / water / solids aided by oil skimmers. The Ex-Basell interceptors discharge at EPA Licensed Discharge Point No. 28, 29 and 30.

Stockpiles will be constructed as low, flat elongated mounds with a maximum slope of 2:1.

Stockpiles will be protected from upslope stormwater surface flows and provided with sediment filters downslope where possible as per Standard Drawing 4.1 of the Blue Book.

Maintenance Activity	Frequency
Periodic cleaning of drains to remove sediment	As required
Stockpiles / excavation areas will be inspected to observe if they are contributing to sedimentation	Weekly and after significant rain event (>10 mm of rain in 24 hours)
Sediment fences, straw bales and other controls will be inspected to ensure they are working effectively	Weekly and after significant rain event (>10 mm of rain in 24 hours)
Discharge points will be inspected to assess whether the erosion and sediment control measures are effective in preventing impacts to the receiving waters	As required
Internal roads will be swept to remove any sediment accumulated on the roadway.	Bi-annually
The Main Interceptor will be inspected on every shift and if cleaning is required the job will be raised in the SAP maintenance system	As per Clyde Water Management Manual
The Ex-Basell interceptors will be inspected on every shift and if cleaning is required the job will be raised in the SAP maintenance system	As per Clyde Water Management Manual
During heavy rain periods the Ex-Basell interceptors will be checked every hour for level and discharge to Duck Creek.	As per Clyde Water Management Manual

AECOM

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FIGURE
Erosion and Sediment Control Plan

VIVA TECHNICAL SUPPORT - WASTE

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