Unanderra Liquid Waste Treatment Facility

Construction Environmental Management Plan

DGL Environmental Pty Ltd

30 November 2023

→ The Power of Commitment

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Contents

Table index

Figure index

Appendices

Abbreviations and definitions

Abbreviation	Definition
BRP	Battery Recycling Plant
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
DGL	DGL Environmental Pty Ltd
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
EPIs	Environment Planning Instruments
EPL	Environmental Protection Licence
ESCP	Erosion and Sediment Control Plan
GHD	GHD Pty Ltd
HSE	Health Safety Environment
JSEA	Job Safety and Environmental Analysis
LEPs	Local Environmental Plans
LGA	Local Government Area
LWTP	Liquid Waste Treatment Plant
PIRMP	Pollution Incident Response Management Plan
POEO Act	The Protection of the Environment Operations Act 1997
SDS	Safety data sheets
SEE	Statement of Environmental Effects
SEPPs	State Environmental Planning Policies
SPL	Spent pickle liquor
SSD	State Significant Development
STR	Stirred Tank Reactors
ULAB	Used Lead Acid Batteries
WARR Act	NSW Waste Avoidance and Resource Recovery Act 2001
WLEP	Wollongong Local Environment Plan
WTP	Wastewater Treatment Plant

1. Introduction

1.1 Overview

DGL Environmental Pty Ltd (DGL) engaged GHD Pty Ltd (GHD) to prepare this Construction Environmental Management Plan (CEMP) for the construction of a new Liquid Waste Treatment Plant (LWTP) at its existing Battery Recycling Plant (BRP) in Unanderra NSW. The Project involves the construction of a new LWTP and demolition of the existing WTP. The DGL site is within the Wollongong LGA and is zoned IN3 Heavy Industrial under the Wollongong Local Environment Plan (WLEP).

An Environmental Impact Statement (EIS) for the Project was prepared by Planning Plus (NSW) Pty Ltd in June 2021. Planning approval for the Project occurred via a State Significant Development (SSD) application under Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (NSW EPA, 1997), with the instrument of approval (SSD-8304) issued on 31 August 2022.

This CEMP has been carried out in general accordance with GHD's proposal ref: 12595126-79364-1, dated 7 October 2022 (GHD, 2022).

1.2 Purpose of this report

The CEMP has been prepared to meet the requirements of the Conditions of SSD-8304 and address the requirements of *Post-Approval Guidance: Environmental Management Plan Guideline – Guideline for Infrastructure Projects* (NSW Department of Planning and Environment(DPE) (2020)) and ensure the project is constructed in accordance with the *Proposed Liquid Waste Treatment Plant EIS* (Planning Plus, 2021a), the *Proposed Liquid Waste Treatment Plant SSD 8304 Response to Submissions Report* (Planning Plus, 2021b) and the *Unanderra Liquid Waste Treatment Facility (SSD- 8304) - Request for Additional Information to Agency Submissions – Response to Submissions Report* (Planning Plus, 2022) ().

Works will not commence until this CEMP and its sub-plans are approved by the Planning Secretary.

The CEMP applies to all construction activities associated with the Project and outlines the overarching environmental management framework for the Project. The Project will be undertaken in accordance with the mitigation measures contained within this CEMP and sub-plans. All employees, subcontractors and visitors must comply with this document at all times.

1.3 CEMP objectives

The objectives of the CEMP are to:

– Identify the environmental issues relevant to the construction of the Project
– Establish the environmental controls to reduce adverse impacts on the environment from site preparatory, construction and demolition works
– Describe the methods and processes by which DGL and its contractors will maintain compliance with the relevant environmental legislation, any applicable licenses, approvals, permits, and or regulatory requirements during construction and demolition
– Provide a framework to effectively manage project works so as to reduce potential adverse impacts on the environment as a result of construction or demolition activities
– Action outcomes from incidents or non-conformances to continually improve the environmental management system

1.4 Relevant sub-plans to the CEMP

The CEMP includes the following sub-plans as identified in SSD-8304:

– Appendix A: Construction traffic management plan
– Appendix B: Erosion and sediment control plan
– Appendix C: Construction and demolition waste management plan
– Appendix D: Unexpected finds protocol

1.5 Limitations

This report has been prepared by GHD for DGL Environmental Pty Ltd and may only be used and relied on by DGL Environmental Pty Ltd for the purpose agreed between GHD and DGL Environmental Pty Ltd as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than DGL Environmental Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect.

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

GHD has prepared this report on the basis of information provided by DGL Environmental Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

These Disclaimers should be read in conjunction with the entire report. This report must be read in full, and no excerpts are taken to be representative of the findings of this report.

2. Project description

2.1 Existing operations

DGL own and operate a Battery Recycling Plant (BRP) and a Wastewater Treatment Plant (WTP) on the premises at No. 201 Five Islands Road Unanderra, NSW. Unanderra is 4.6km south-west of the Wollongong Central Business District (CBD). The site is approximately 3km west of Port Kembla on the western side of the M1 Princes Motorway and the Five Islands Road, see Figure 2.1. The legal site descriptors are Lot 3, DP 259921 and occupies an approximate area of 2 hectare (ha).

Figure 2.1 Site locality

The site has been used as an industrial waste treatment facility since the 1960's. In 1992 Hydromet purchased the facility and continued to develop and operate the waste management, resource recovery and recycling operation on the site. Following the new ownership in 2012, there has been substantial investment in upgrading the plant and equipment on site.

Activities on the site are regulated via an Environmental Protection Licence (EPL) 5874 administered by the NSW Environment Protection Authority (EPA) (2000) and State Significant Development approval (SSD) 8304 administered by the NSW Department of Planning and Environment (2002).

The facility operates 24 hours a day, 5 days a week (Monday to Friday) with the laboratory and administration office operating between 7am to 5pm. Occasional work takes place on weekends however no activities are undertaken on Sundays or public holidays. All operational areas of the site are asphalt paved and bunded with parking provided for employees and site visitors opposite and adjacent to the administration building along the eastern boundary of the site. The site has an average of 50 to 60 truck arrivals per week with arrivals scheduled over a 14 hour period of between 6am and 8pm to minimise congestion and vehicle noise on and off site.

2.1.1 Battery recycling plant

The BRP commenced operation in 2006 under Development Consent DA2003/1718 issued by Wollongong City Council to process up to 12,000 tonnes per annum of Used Lead Acid Batteries (ULABs). A second Development Consent (DA2007/1572) was issued by Council in February 2008 to increase the ULAB processing capacity to 36,000 tonnes per annum. DGL has incrementally increased the ULAB collection and processing capabilities to reach the maximum licensed capacity limit. The BRP processes a mix of used automotive and industrial lead acid batteries sourced from a number of collectors/scrap dealers and battery retailers.

DGL is Australia's second largest processor of ULAB's and recycles the processed batteries into valuable intermediate lead products and plastic scrap that is on sold to smelters and plastic recyclers for reprocessing back into new lead acid batteries.

2.1.2 Existing wastewater treatment plant

The BRP produces approximately 48,000 tonnes per annum of wastewater and battery acid which are pumped into the existing on-site WTP for treatment and disposal. The treatment process undertaken in the WTP follows the same methodology proposed for the new Liquid Waste Treatment Plant (LWTP) which is termed 'neutralisation' or 'acid-base reaction' where battery acid and wastewater is mixed with a hydrated lime (calcium hydroxide) slurry in a series of Stirred Tank Reactors (STRs) to a pH between 8 to 10. The products from the neutralisation reaction are an inert gypsum (calcium sulphate) solid and water and approximately 5,000 tonnes per annum is separated from the slurry mixture through a Filter Press and is disposed of at an EPA licenced landfill facility following quality control testing.

Quality control testing is conducted on each batch to ensure conformance to Sydney Water trade waste discharge guidelines. Once approved, batches are transferred to a holding tank for continuous discharge to sewer. DGL holds a current Trade Waste Discharge Consent (Consent Number 18024) issued by Sydney Water to discharge up to a maximum of 450kL per day of trade waste.

The WTP has been in service on the site for over 30 years and was in operation on the site prior to the acquisition of the business by Hydromet from MRI Pty Ltd in 1993. No development consent or approval exists for the WTP to DGL's knowledge.

2.2 Liquid waste treatment plant

DGL propose to replace the existing WTP to continue processing battery acid and wastewater from the BRP and collect, treat and dispose of aqueous waste generated from aluminium extrusion (caustic) and galvanising industry (spent pickle liquor (SPL)). The LWTP will have a treatment capacity of 56,500 tonnes per annum. The LWTP will be located within the existing 435 m^2 Building E (shown in Figure 2.2). DGL plan to utilise its own tanker fleet and transport contractors to organise waste collection.

Once the LWTP is fully operational, DGL intends to decommission and demolish the existing WTP as the facility has been in service for over 30 years and the plant and assets have reached the end of its useful life.

The LWTP will be supported by a refurbished liquid waste storage tank farm located in the adjacent Store B to the north. The interaction between the two facilities will be fully automated.

Figure 2.2 Site Layout Plan

2.3 Construction activities

Refurbishment of Building E will need to be undertaken to make it fit for the purpose of the LWTP. There will be no major structural changes to the roof or walls of Building E. The refurbishment will include:

- Construction of a new concrete floor on top of the existing concrete floor
- Construction of a new concrete block perimeter bunding
- New sumps and drains
- New concrete ramps
- New electrical services

All process equipment will be located inside bunds that have been designed to contain 110% of the volume of the largest tank. The plant and equipment to be installed is listed in Table 2.1. All floors, bund walls and sumps will be coated with an epoxy resin product to prevent corrosive chemicals from attacking the concrete and leaching into the soil.

The proposed construction methodology described in the EIS indicates sections of the concrete floor in Building E will be demolished and localised excavation works undertaken for the installation of channel drains and foundations for process plant, with a 200 to 300mm concrete layer laid over the entire floor area for strength and additional capping. However, DGL has advised GHD that the proposed development of the LWTP will not include any subsurface intrusion as the structure will be built upon a raised concrete plinth founded within the concrete footings of the building. The inclusion of the concrete plinth was to satisfy a Council development consent condition which required that the finished floor level (FFL) within Building E be raised to RL 10.34 m Australian Height Datum (AHD), which is approximately 1 m above the current FFL.

Construction hours will be restricted to 7.00am to 6.00pm Monday to Friday, and 8.00am to 1.00pm Saturdays. No construction work will occur on Sundays or public holidays.

Table 2.1 List of plant and equipment to be installed in Building E

Equipment name	Tank capacity (kL)
Neutralisation Reactor 1	75
Neutralisation Reactor 2	75
Neutralisation Reactor 3	75
Holding Tank	75
pH Adjustment Tank 1	75
pH Adjustment Tank 2	75
Polishing Filter Manifold	-
Filtrate Storage Tank	75
Sumps Collection Tank	75
Filter Press	-
Rotary Dryer	-
Dust Extraction System	-
Acid Scrubber	-
Caustic Scrubber	-
Solid Waste Packaging Plant	-
Various pumps and conveyors	-

Source: DGL Environmental Pty Ltd

3. Regulatory framework

This section outlines the regulatory requirements for construction of the new LWTP at the existing DGL premises in Unanderra.

3.1 Conditions of approval

Table 3.1 provides a summary of the SSD-8304 conditions and revised management measures relevant to the CEMP and where these have been considered and addressed in this sub-plan.

Table 3.1 Compliance matrix

Item/Condition	Requirements	Document reference
A2	The overall development may only be carried out: (a) in compliance with the conditions of this consent. (b) in accordance with all written directions of the Planning Secretary. (c) in accordance with the LWTP EIS and Response to Submissions. (d) in accordance with the BTP (*sic* BRP) EIS and Response to Submissions SEE and Responses to Further Information Requests. (e) in accordance with the Development Layout in Appendix 1; and (f) in accordance with the management and mitigation measures in Appendix 2.	This document
B1	Prior to the commencement of any construction or other surface disturbance associated with the LWTP, the Applicant must install and maintain suitable erosion and sediment control measures on-site, in accordance with the relevant requirements of the Managing Urban Stormwater: Soils and Construction - Volume 1: Blue Book (Landcom, 2004) guideline and the Erosion and Sediment Control Plan included in the CEMP required by condition D2.	Appendix B
B11	Prior to the commencement of construction of the LWTP, the Applicant must prepare an unexpected contamination finds procedure to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the of the CEMP in accordance with condition D2 and must ensure any material identified as contaminated is disposed of in accordance with the POEO Act and its associated regulations. Details of the final disposal location and the results of any associated testing must be submitted to the Planning Secretary prior to removal of the contaminated material from the site.	Appendix D
B13	Prior to the commencement of construction of the LWTP, the Applicant must prepare a Construction Traffic Management Plan (CTMP) to the satisfaction of the Planning Secretary. The plan must form part of the CEMP required by condition D2 and must: (a) be prepared by a suitably qualified and experienced person(s). (b) be prepared in consultation with Council. (c) detail the measures that are to be implemented to ensure road safety and network efficiency during construction. (d) detail heavy vehicle routes, access, and parking arrangements. (e) include a Driver Code of Conduct to: (i) minimise the impacts of earthworks and construction on the local and regional road network. (ii) minimise conflicts with other road users. (iii) minimise road traffic noise; and (iv) ensure truck drivers use specified routes. (f) include a program to monitor the effectiveness of these measures; and (g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.	Section 5.4.6 and Appendix A

Item/Condition	Requirements	Document reference
B14	The Applicant must: (a) not commence construction of the LWTP until the Construction Traffic Management Plan (CTMP) required by condition B13 is approved by the Planning Secretary; and (b) implement the most recent version of the CTMP approved by the Planning Secretary for the duration of construction.	Section 5.4.6 and Appendix A
B16	Prior to the commencement of construction of the LWTP, the Applicant must prepare a Construction and Demolition Waste Management Plan to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with condition D2 and must: (a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling, and disposal locations; and (b) be implemented for the duration of construction works.	Section 5.4.5 and Appendix C
B17	The Applicant must: (a) not commence construction until the Construction and Demolition Waste Management Plan is approved by the Planning Secretary. (b) implement the most recent version of the Construction and Demolition Waste Management Plan approved by the Planning Secretary.	Section 5.4.5 and Appendix C
D1	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include: (a) detailed baseline data. (b) details of: (i) the relevant statutory requirements (including any relevant approval, licence, or lease conditions). (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures. (c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria. (d) a program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to paragraph above. (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible. (f) a program to investigate and implement ways to improve the environmental performance of the development over time. (g) a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria). (ii) complaint. (iii) failure to comply with statutory requirements; and (h) a protocol for periodic review of the plan.	Refer to sub-plans Section 3.2 Section 5.4.3 Section 5.4 Section 5.4 Section 6.1 Section 6.1 Section 6.2 Section 4.4 Section 4.7 Section 4.8 Section 6.3
D2	The Applicant must prepare a Construction Environmental Management Plan (CEMP) for the LWTP development in accordance with the requirements of condition D1 and to the satisfaction of the Planning Secretary.	This document

Item/Condition	Requirements	Document reference
D3	As part of the CEMP required under condition D2 of this consent, the Applicant must include the following: (a) Construction Traffic Management Plan (b) Erosion and Sediment Control Plan (c) Construction and Demolition Waste Management Plan; and (d) Unexpected Finds Protocol	 Appendix A Appendix B Appendix C Appendix D
D4	The Applicant must: (a) not commence construction of the LWTP until the CEMP is approved by the Planning Secretary; and (b) carry out the construction of the LWTP in accordance with the CEMP approved by the Planning Secretary and as revised and approved by the Planning Secretary from time to time.	 Section 1.2 Section 6.3

3.2 Legal and statutory requirements

Table 3.2 includes an overview of regulatory requirements for the construction of the LWTP.

Table 3.2 Summary of legal and statutory requirements

Act / Regulation / Guidelines	Description	Applicability to CEMP
Environmental Planning and Assessment Act 1979 No 203 (EP&A Act) (DPE, 1979)	Provides the statutory framework for planning approval and environmental assessment of development proposals in NSW. This environmental and planning decision making is facilitated with reference to State and Local Environmental Planning Instruments (EPIs) created under Part 3 of the EP&A Act comprising: – State Environmental Planning Policies (SEPPs); and – Local Environmental Plans (LEPs).	The construction of the LWTP is approved as a state significant development (SSD 8304). The conditions of SSD 8304 must be complied with during construction of the LWTP.
Wollongong Local Environmental Plan 2009 (Wollongong City Council, 2009)	The DGL site is within the Wollongong LGA. The Wollongong Local Environmental Plan 2009 (WLEP) provides the planning framework guiding decision making for land use and development in the Wollongong LGA. Under the WLEP the subject land is within Zone IN3 Heavy Industrial. The WLEP states the objectives of the IN3 Heavy Industrial Zone are as follows: – To provide suitable areas for those industries that need to be separated from other land uses. – To encourage employment opportunities. – To minimise any adverse effect of heavy industry on other land uses. – To support and protect industrial land for industrial uses. – To facilitate the ongoing sustainability of steel making and steel product manufacturing that will contribute to the economic and employment growth of Wollongong.	The construction of a new LWTP at the DGL site is consistent with the aims of the WLEP as it results in an increase in employment and both direct and indirect economic benefits. It optimises the use of the site, improves the site operations and improves liquid waste stream processing, reuse and disposal for the improvement of broader resource recovery outcomes.

Act / Regulation / Guidelines	Description	Applicability to CEMP
Protection of the Environment Operations Act 1997 (NSW EPA, 1997)	The Protection of the Environment Operations Act 1997 (POEO Act) is the principal NSW environmental protection legislation and is administered by the EPA. Schedule 1 of the POEO Act lists the "Scheduled Activities" which are regulated by an Environmental Protection Licence (EPL) from the EPA. Pursuant to Section 55 of the POEO Act DGL is the holder of an existing EPL 5874 for the (NSW EPA, 2000) Scheduled Activities of Resource Recovery and Waste Storage. There is a requirement under the POEO Act to report any pollution incidents to the EPA or local council where material harm to human health or the environment is caused or threatened.	The site must be operated and maintained in accordance with the conditions of EPL 5874 (NSW EPA, 2000). Pollution incidents that occur during construction which cause or threaten material harm to human health or the environment must be reported to the EPA and all relevant authorities immediately in accordance with the site's Pollution Incident Response Management Plan. Refer to Section 4.4.
NSW Waste Avoidance and Recovery Act 2001 (NSW EPA, 2001)	The NSW Waste Avoidance and Resource Recovery Act 2001 (WARR Act) sets the strategic direction for waste management and resource recovery in NSW. It encourages the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecological sustainable development. Among the main objectives of the WARR Act are: a. avoidance of unnecessary resource consumption. b. resource recovery (including reuse, reprocessing, recycling, and energy recovery, or c. disposal.	A waste management plan is a requirement for new developments in NSW and must be written with reference to the *NSW Waste and Sustainable Materials Strategy 2041* (DPIE, 2021), made under the WARR Act. This CEMP was prepared in accordance with the objectives of the strategy.

4. Environmental management

The following sections outline the overarching management arrangements for construction of the LWTP including roles and responsibilities, communications, training, incident management, records, reporting and complaints.

4.1 Roles and responsibilities

While all personnel working on the LWTP are responsible for managing the environmental impact of their activities, the Contractor Project Manager has the overall responsibility for the construction of the LWTP. The responsibilities of key roles involved in the Project are outlined in Table 4.1.

Table 4.1 Roles and responsibilities

Role	Responsibilities
DGL Project Manager	– Coordination of contractor activities – Ensure the requirements of this CEMP are fully implemented, and that environmental requirements are not secondary to other construction requirements – Endorse and support the DGL environmental management system and policy – Participate and provide guidance in the regular review of this plan – Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and maintenance of this plan – Liaise with relevant government authorities, as required, including incident reporting and investigation – Contract Management, ensuring all obligations are met for the Project – Ensure all site approvals are obtained before construction
Contractor Project Manager	– Overall construction methodology and execution of the works as defined in the contract – Clearly defining roles, responsibilities and expectations throughout the construction team – Define the programme structure and responsibilities – Productivity review and performance communication with team – Sub-contractor selection criteria, on boarding according to the DGL requirements – Risk assessment and management of the project site – Monitor performance trends and implement corrective actions via the Site Manager – Monthly reporting to DGL – Ensure that complaints are investigated, and issues are resolved in accordance with this plan – Ensure that incidents are reported and investigated, and issues are resolved in accordance with this plan – Direct that works be stopped immediately where there is an actual or potential risk of harm to the environment, property and/or human health – Coordination of unexpected finds and mitigation
Contractor Site Manager	– Execution of construction activities in accordance with safety, environment and quality requirements – Support the Contractor Project Manager – Drive progress to ensure the scope of work is delivered within the approved contract timeframe – Manage plant and equipment in accordance with manufacturer's specifications – Plan deliveries to avoid double handling – Ensure communication channels across all work fronts are clear – Monitor performance of subcontractors, vendors and others on the project – Coordinate daily site operations – Regularly participate and lead pre-start meetings and Toolbox meetings – Ensure adequately skilled staff are undertaking key roles e.g. operation of plant where licence or competency required, clean up of spills – Manage change in contract scope with the Contractor Project Manager to ensure that all time, resources etc. resulting from the change are accurately noted – Report accurate information to the Contractor Project Manager

Role	Responsibilities
	– Maintain a daily diary – Maintain a waste management register – Manage relationships with DGL Project Manager as required – Manage relationships with subcontractors – Actively participate in the DGL Health Safety Environment (HSE) and Quality Programmes – Complete worksite investigations and complete accurate and timely reporting – Carry out all work in a safe and efficient manner and report all hazards, incidents and accidents promptly – Actively support and communicate with your fellow employees on HSE related programs, policies and procedures – Complete Workplace Inspections as required within the Contractor and DGL written instructions – Manage workplace material waste within sphere of control such that damage to the environment is minimised – Follow Contractor and DGL directives while on site
Contractor HSE Advisor	– Ensure compliance with project HSE requirements and the site HSE management plan and CEMP – Maintain JSEA's including the register and work force compliance – Ensure all personnel entering site have the required inductions – Ensure all plant and equipment has a daily prestart and logbooks are maintained – Conduct weekly site inspections and record site conditions and any non-compliances – Coordinate area and activity inspections communicate and report observations – Generate Toolbox talks – Communicate relevant incidents in accordance with the agreed procedures – Communicate general safety and environmental awareness – Maintain the project risk assessment
All Contractor Staff and Subcontractors	– Complete induction and trainings prior to commencing works on the Project – Maintain competencies relevant to your activities – Understand risks associated with your activities – Stop work immediately if a particular activity is carried out in an unsatisfactory manner – Undertake your activities in accordance with the CEMP and specific instructions issued by your supervisor – Report environmental incidents to your supervisor

4.2 Environmental training

All contractor staff and subcontractors are required to complete a project specific induction prior to undertaking any work on the Project and are to be advised of the requirements of the CEMP during induction. The CEMP is to be made available to all relevant staff and subcontractors. The training requirements for all staff, subcontractors and visitors are outlined in Table 4.2.

Table 4.2 Environmental training requirements

Type of Training	Content Outline	Role Requiring Training	Frequency	Records
Employee induction	– Site induction – Requirements of the CEMP related to their role	All staff	– Prior to commencing work of the project – Refresher sessions where updates to the CEMP or sub-plans	Register of completed induction maintained in project training matrix
Subcontractor induction	– Site induction – Requirements of the CEMP related to their role	All subcontractors	– Prior to commencing work of the project – Refresher sessions where updates to the CEMP or sub-plans	Register of completed induction maintained in project training matrix

Type of Training	Content Outline	Role Requiring Training	Frequency	Records
Visitor induction	– Site induction	All visitors	Prior to entering site	Register of completed induction maintained in project training matrix

4.3 Communications

4.3.1 NSW Department of Planning and Environment (DPE)

In accordance with SSD-8304, DPE is to be notified as per Table 4.3.

Table 4.3 Notification requirements – DPE

Event	Requirement	Responsibility	Records
Commencement of Construction	Notify the Planning Secretary at least one month before the commencement (or other timeframe agreed with the Planning Secretary)	DGL Project Manager	Written notification
If any of the following is to be staged: – Construction – Operation – Decommissioning	Notify the Planning Secretary at least one month before the commencement of each stage (or other timeframe agreed with the Planning Secretary)	DGL Project Manager	Written notification
Incident	Notify the Planning Secretary via the Major Projects website immediately after becoming aware of an incident	DGL Project Manager	Written notification via the Major Projects website
Non-compliance	Notify the Planning Secretary via the Major Projects website within seven days of becoming aware of a non-compliance	DGL Project Manager	Written notification via the Major Projects website

4.3.2 Community

In accordance with SSD-8304, the community shall be notified where there are any potential disruptions to transport routes. The list of contact details of neighbouring businesses is provided in Table 4.4.

Table 4.4 Contact details of neighbouring businesses

Company Name	Site Address	Contact Number
BlueScope Steel Welded Products	203 Five Islands Road, Unanderra	02 4272 2544
Bisalloy Steels	18 Resolution Drive, Unanderra	02 4272 0444
Morrow Equipment Company	25 Resolution Drive, Unanderra	02 4272 2044
McKeon Swim Centre	1 Marley Place, Unanderra	02 4272 7272
Onsite Rental Group	6 Marley Place, Unanderra	02 4247 3400
Premium Tyre Service	2/6 Marley Place, Unanderra	02 4276 4090
Prokote	6 Marley Place, Unanderra	02 4272 3411

4.4 Incident response

Environmental Incidents include, but are not limited to:

– Spills of chemicals or liquid waste
– Incidental discharge to the air or water (e.g. contaminated water in storm water system, gas leak)
– Uncontrolled release of contaminants

– Near hits (e.g. loss of product to containment)
– Fire
– Flooding of the site

All environmental incidents will be reported in accordance with SSD-8304 and the DGL procedures including:

– DGL Emergency Plan (DGL.EP.21.003.00)
– DGL Pollution Incident Response Management Plan (PIRMP)

All environmental incidents are to be reported to the Planning Secretary via the Major Projects website as outlined in Table 4.5. Where incidents cause or have the potential to cause material harm to people or the environment this will trigger the implementation of the PIRMP and notification to the NSW EPA and other relevant agencies.

All other incidents are to be managed in accordance with the procedures outlined in the DGL Emergency Plan.

4.5 Records

The following records will be maintained to demonstrate compliance with this CEMP:

– Site induction and training records
– Weekly site inspection records
– Environmental incident reports
– Complaint records
– Corrective action reports
– Vehicle inspection and maintenance records
– Contractor reports to DGL (environmental or construction progress reports)
– Contractor HSE monthly reports
– Safety data sheets (SDS)
– Toolbox talk agendas and attendance
– Job Safety and Environmental Analysis (JSEAs)
– Waste management register

The Contractor will utilise their existing suite of templates and maintain a document and records management process for the Project for all project documents. Paper copies of documents and records will be maintained on site.

4.6 Reporting

Environmental reporting requirements for the Project are outlined in Table 4.5.

Table 4.5 Reporting requirements

Name	Frequency	Requirement	Responsibility	Records	Distribution
Inspection report	Weekly	Site inspection to identify potential environmental issues and hazards	Contractor HSE Advisor	Site inspection check sheet	Contractor team
Incident report	Event based	Report of incident in accordance with reporting requirements outlined in Section 4.4	Contractor HSE Advisor	Incident report	DPE Contractor management team DGL
Complaints	Event based	Report of complaint in accordance with requirements in Section 4.7	Contractor HSE Advisor	Incident report	DPE Contractor management team DGL

Name	Frequency	Requirement	Responsibility	Records	Distribution
Non-compliances	Event based	Report of non-compliance in accordance with reporting requirements in Section 4.8	Contractor HSE Advisor	Incident report	DPE Contractor management team DGL
HSE report to management	Monthly	Project status and highlighting project issues	Contractor HSE Advisor	Report	Contractor management team
Contractor progress report	Monthly	Project status and highlighting key project issues	Contractor Project Manager	Report	DGL

4.7 Complaints handling

Environmental complaints made to DGL, the Contractor or any employee of the project will be documented and investigated. Information to be retained for complaints is detailed in EPL 5874. Corrective actions will be developed and closed out as appropriate, based on the level of risk and, if applicable reported to relevant agencies.

DGL has a procedure to receive, document and respond to all complaints. Enquiries and complaints can be made through a dedicated phone line, email address and the DGL website shown in Table 4.6.

Table 4.6 Contact for public enquiries

Contact	General Manager - DGL Environmental Pty Ltd
Telephone	02 4247 2100
Email	Keith.Mau@dglgroup.com
Website	https://www.dglgroup.com/

4.8 Non-compliance and corrective action

A non-compliance occurs when an operation or system does not comply with control standards or limits specified. For the demolition or construction works, non-compliances relate to any departure from a requirement of this CEMP, or any activity that has the potential to breach regulatory requirements or have an adverse impact on the environment.

Non-compliance can be either potential or actual and are identified and raised through processes such as monitoring, inspections/audits, incidents and complaints. This mechanism allows for opportunities for improvement to be identified and acted upon.

There are two types of non-compliance: minor and major. Minor non-compliances occur when isolated discrepancies are found between what has/is required and what has/is occurring. A minor non-compliance does not have the potential to cause significant adverse environmental effects or material harm to the environment. A major non-compliance includes when the ability to control a process or product has been significantly reduced and threatens material harm to the environment.

Corrective actions raised in relation to non-compliances will be entered, tracked and closed out through a complaints and incident management register.

Non-compliances must be reported to the Contractor HSE Advisor and the Planning Secretary in accordance with the requirements in Table 4.3.

5. Mitigation measures

The following sections outline the environmental framework, risks identified and measures to mitigate impacts on the environment from construction of the Project.

5.1 Environmental management system

DGL maintain an Environmental Management System (EMS) to manage environmental impacts of its operations, provide a structured approach to environmental management and ensure satisfaction of its environmental policy and compliance with relevant legislative requirements. A copy of the EMS document is provided in Appendix E. The project is to be conducted in accordance with the policies and procedures described in the EMS.

5.2 Environmental policy

DGL's environmental policy commits the organisation and all employees to minimising impacts on the environment through environmental awareness, management commitment to the EMS, implementing a systematic approach to identifying and managing environmental risks, and considering the environment as an integral part of site operations.

5.3 Risk assessment

A preliminary environmental risk assessment was undertaken as part of the EIS prepared by Planning Plus (Planning Plus, 2021a). This risk assessment identified key environmental issues associated with the establishment of the proposed LWTP on the DGL Unanderra site. A qualitative determination was made to identify 'key' environmental issues. A breakdown of the environmental issues into "key" and "other" is provided in Table 5.1.

Table 5.1 Preliminary environmental risks

Attribute	Matters for Consideration
Air Quality/ Odour/ Greenhouse Gas	Changes to air emissions and fugitive emissions, including dust emissions associated with increased processing and truck movements. Changes to Greenhouse Gas emissions from the site.
Noise and Vibration	Changes to noise generation affecting sensitive residential receptors surrounding the site. Changes to road traffic noise.
Hydrology/ Water Balance/ Water Quality	Changes to impervious runoff areas. Changes to water demands at the facility. Changes to site water balance and surface water management.
Waste Management	Changes to quantity, nature and management of waste streams. Minimisation of waste.
Traffic and Transport	Changes to road traffic generation associated with increased processing of materials. Potential impacts to the capacity, level of service and safety of local roads and intersections.
Contamination and Soils	Assessment of potential for soil contamination on site.
Hazards and Risks	Storage and use of hazardous materials on the site. Impacts on human health from hazardous materials. Management of fire and other environmental incidents.
Visual Amenity	Changes to visual amenity as a result of changes at the site.
Biodiversity	Potential impacts to vegetation and potential fauna habitat if present.
Heritage	Potential impacts to Aboriginal heritage items if present. Meeting regulatory requirements.

Attribute	Matters for Consideration
Infrastructure and Services	Impact on services and infrastructure.
Socio - Economic	Economic effects at the Regional and State level. Changes to amenity issues such as noise, traffic and air quality that may impact amenity of affected sensitive receptors.
Cumulative Impacts	Assessment of existing environment and potential impacts from proposed LWTP.

5.4 Environmental management measures

5.4.1 Air quality

The subject site is surrounded by existing industrial uses. The locations of sensitive receptors used to assess air quality impacts from the construction are consistent with those for the noise assessment. The closest sensitive residential receptors are approximately 650 m to 1 km to the west of the site. Controls to manage air quality impacts during construction are outlined in Table 5.2.

Table 5.2 Environmental management measures – air quality

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Maintain the site as asphalt pavement (except landscape areas)	Pre-construction	Once off	NA	Contractor Site Manager
EIS	Maintain the yard area in a clean and tidy manner	Construction	Ongoing	NA	Contractor Site Manager
EIS	Clean up any incidental spills immediately	Construction	Event based	NA	Contractor Site Manager
EIS	Regularly sweep and/or hose of hardstand areas	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Conduct visual checks for dust emissions beyond the boundary	Construction	Weekly	Weekly site inspection	Contractor Site Manager
EIS	Switch off engines of on-site vehicles and plant when not in use	Construction	Ongoing	NA	Contractor Site Manager
EIS	Fit all vehicles and plant with pollution reduction devices where practicable	Construction	Ongoing	Invoices from the mechanic	Contractor Site Manager
EIS	Maintain and service vehicles according to manufacturer's specifications	Construction	Ongoing	Vehicle inspection and maintenance records Invoices from the mechanic	Contractor Site Manager
EIS	Maintain and service wet scrubbers regularly	Commissioning	Weekly	Weekly site inspection	Contractor Site Manager
EIS	Maintain and service dust extraction systems regularly	Construction	Ongoing	Invoices from the mechanic Vehicle inspection and maintenance records	Contractor Site Manager
EIS	Inspect plant and equipment daily to ensure optimal operations	Construction	Ongoing	NA	Contractor Site Manager

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Conduct emission testing to ensure control equipment operate within manufacturers specifications	Construction	Annual	Vehicle inspection and maintenance records	Contractor Site Manager
EIS	Use water sprays when excessive dust is generated	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Store materials in designated storage areas	Construction	Weekly	Weekly site inspection	Contractor Site Manager
EIS	Clean all sealed driving surfaces on the site regularly	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Abide the site speed limits at all times	Construction	Ongoing	NA	Contractor Site Manager
EIS	Cover all vehicle loads when transporting material on and off the site	Construction	Ongoing	NA	Contractor Site Manager
EIS	Check the access driveway to the site and clean any dust, material or mud tracked onto the road	Construction	Ongoing	NA	Contractor Site Manager
EIS	Record all air/dust incidents and breaches	Construction	Event based	Environmental incident reports	Contractor HSE Advisor
EIS	Log and investigate complaints	Construction	Event based	Environmental incident reports	Contractor HSE Advisor
ESCP	Protect stormwater inlets from dirty water runoff	Construction	Ongoing	Weekly site inspection	Contractor HSE Advisor

5.4.2 Greenhouse gas

Controls to manage greenhouse gas impacts during construction are outlined in Table 5.3.

Table 5.3 Environmental management measures – greenhouse gas

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Monitor the consumption of fuel by construction vehicles	Construction	Ongoing	Fuel records	Contractor Site Manager
EIS	Maintain diesel powered equipment to ensure operational efficiency	Construction	Ongoing	Vehicle inspection and maintenance records	Contractor Site Manager
EIS	Turn diesel equipment off when not in use	Construction	Ongoing	NA	Contractor Site Manager
EIS	Minimise double handling of material and use efficient transport routes	Construction	Ongoing	NA	Contractor Site Manager
EIS	Monitor the total site electricity consumption and investigate avenues to minimise the electricity requirements	Construction	Ongoing	Energy bills	Contractor Site Manager
EIS	Provide energy awareness programs for staff and subcontractors	Construction	Ongoing	Toolbox talk agendas	Contractor Site Manager

5.4.3 Noise and vibration

Controls to manage noise and vibration impacts during construction are outlined in Table 5.4.

Table 5.4 Environmental management measures – noise and vibration

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Conduct construction activities during approved hours from SSD-8304 Monday to Friday 7.00am to 6.00pm Saturdays 8.00am to 1.00pm	Construction	Ongoing	NA	Contractor Site Manager
EIS	Keep doors closed on all buildings where practicable	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
Industry best practice	Keep to site speed limits	All	Ongoing	NA	Contractor Site Manager
EIS	Switch off truck engines when not in use for extended periods	Construction	Ongoing	NA	Contractor Site Manager
EIS	Record all noise incidents and breaches	Construction	Event based	Environmental incident reports	Contractor HSE Advisor
EIS	Log and investigate noise complaints	Construction	Event based	Environmental incident reports	Contractor HSE Advisor
EPL 5784 Condition L3.1 and L3.2	Maintain noise levels below the limits specified in Condition L3.1 and L3.2 at EPA ID Points 2 and 3	All	Ongoing	Noise monitoring results	Contractor HSE Advisor

5.4.4 Surface water and hydrology

Appendix B provides the Erosion and Sediment Control Plan (ESCP) for management of dirty water generated during the project. A summary of controls to manage surface water impacts during construction is provided in Table 5.5.

Table 5.5 Environmental management measures – surface water and hydrology

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Conduct refuelling and vehicle maintenance work within a designated bunded area	Construction	Ongoing	NA	Contractor Site Manager
EIS	Keep spill kits on site at all times for immediate clean-up of accidental chemical /fuel spills. Dispose of any contaminated spill rags at an approved waste facility	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Inspect all bunding on site regularly for structural soundness and effectiveness	Construction	Ongoing	Weekly site inspection	Contractor Site Manager

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Store materials above the 100-year ARI flood level	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Record all chemicals stored on site on a register. Keep the relevant Safety Data Sheets on site	Construction	Ongoing	Materials Safety Data Sheets	Contractor Site Manager

5.4.5 Waste

Appendix C provides the Construction and Demolition Waste Management Plan for waste management and mitigation during the construction of the Project. A summary of controls to manage waste impacts during construction is provided in Table 5.6.

Table 5.6 Environmental management measures – waste

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Manage all waste generated as a result of the proposed construction works in accordance with the EPA's Waste Classification Guidelines	Construction	Ongoing	Waste management register Invoices from waste disposal facilities	Contractor Site Manager
EIS	If any potentially contaminated material is encountered during construction of the LWTP it would be managed in accordance with the measures outlined in Appendix D and the existing onsite Work Health and Safety Procedures	Construction	Ongoing	Invoices from waste disposal facilities	Contractor Site Manager
EIS	Follow the principles outlined in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 – Avoid and reduce waste generation – Increase recycling – Divert more waste from landfill – Manage problem wastes better – Reduce litter – Reduce illegal dumping	Construction	Ongoing	NA	Contractor Site Manager
EIS	Maintain documents and records of the transport and fates of all materials removed from the site	Construction	Ongoing	Invoices from waste disposal facilities Waste management register	Contractor Site Manager
EIS	Minimise the generation of waste on-site	Construction	Ongoing	NA	Contractor Site Manager

5.4.6 Traffic, transport, and access

Appendix A provides the Construction Traffic Management Plan for traffic, transport and access management and mitigation during the construction of the Project. All construction traffic movements should be undertaken in accordance with the controls outlined in the CTMP.

Table 5.7 Environmental management measures – traffic, transport and access

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Manage traffic movements, parking and laydown in accordance with the Construction Traffic Management Plan (Appendix A)	Construction	Ongoing	As per CTMP	Contractor Site Manager

5.4.7 Soils and contamination

Controls to manage soil and contamination impacts during construction are outlined in Table 5.8.

Table 5.8 Environmental management measures – soils and contamination

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Minimise on site excavations	Construction	Ongoing	NA	Contractor Site Manager
EIS	Place any excavated material in stockpiles on an impermeable surface to prevent leaching of potential contaminated material	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Cover stockpiles with an impermeable covering and bund it to prevent loss of soil	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Signpost stockpiles that potentially containing contaminated material as contaminated material	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Reuse excavated material on site where possible	Construction	Ongoing	Waste classification	Contractor Site Manager
EIS	Any excavated material that requires disposal would be subject to waste classification under the EPA's Waste Classification Guidelines and would be disposed of at an appropriate licensed facility	Construction	Ongoing	Invoices from waste disposal facilities	Contractor Site Manager
EIS	Engage licensed asbestos removalist to dispose of any uncovered asbestos material	Construction	Ongoing	Invoices from waste disposal facilities	Contractor Site Manager
EIS	Maintain a record of all site works, including the status of any excavation or stockpiles throughout the works in accordance with the site-specific EMP	Construction	Ongoing	Weekly site inspection	Contractor HSE Advisor
EIS	Stabilise disturbed areas as soon as possible and in a progressive manner as works are completed	Construction	Ongoing	NA	Contractor Site Manager
EIS	Cease works immediately if any contamination (e.g. discoloured soil, strong chemical odours, refuse or leachate) is discovered during excavation, and implement the Unexpected Finds Protocol (Appendix D)	Construction	Ongoing	Environmental incident reports	Contractor HSE Advisor

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Cease works immediately if any Acid Sulphate Soil material is discovered during excavation, and implement the Unexpected Finds Protocol (Appendix D)	Construction	Ongoing	Environmental incident reports	Contractor HSE Advisor

5.4.8 Hazards and risks

Controls to manage noise and vibration impacts during construction are outlined in Table 5.9.

Table 5.9 Environmental management measures – hazards and risks

Reference	Measure	Project Phase	Frequency	Records	Responsibility
EIS	Train all employees in emergency response measures prior to working on the site	Construction Commissioning	Ongoing	Site induction and training records	Contractor Site Manager
EIS	Maintain spill kits on the site and located in key areas at all times	Construction	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Clean up spills immediately	Construction Commissioning	Ongoing	NA	Contractor Site Manager
EIS	Replenish the spill kit immediately when used	Construction Commissioning	Ongoing	NA	Contractor Site Manager
EIS	Identify faulty or unsafe equipment immediately and take out of operation and replace	Construction Commissioning	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Maintain fire protection measures would include sprays, hoses and extinguishers as per the requirements of AS1851. Include a Fire Brigade response in the EMP	Construction Commissioning	Ongoing	Weekly site inspection	Contractor HSE Advisor
EIS	Fit all equipment with appropriate safety switches and emergency stop buttons	Commissioning	Ongoing	Weekly site inspection	Contractor Site Manager
EIS	Carry out regular workplace inspections to identify hazards and implement any necessary rectifications	Construction Commissioning	Ongoing	Weekly site inspection	Contractor HSE Advisor
EIS	Implement all site security measures including visitor report in/ sign off procedures	Construction Commissioning	Ongoing	Site induction and training records	Contractor HSE Advisor
EIS	Record all incidents onsite in accordance with the incident management protocols	Construction	Ongoing	Environmental incident reports	Contractor HSE Advisor
EIS	In the case of major incidents the Contractor HSE Advisor would activate the DGL Group Emergency Plan and liaise with the external emergency services	Construction	Ongoing	Environmental incident reports	Contractor HSE Advisor Contractor Site Manager

6. Monitoring and review

The following section outlines the environmental monitoring requirements during construction of the Project and the review requirements for this CEMP.

6.1 Monitoring and inspections

Environmental monitoring required during construction of the Project to assess impacts on the environmental is detailed in Table 6.1. Where adverse results are identified through monitoring, these will be investigated, and measures implemented (where applicable) to bring results back within expected levels.

Table 6.1 Construction environmental monitoring requirements

Monitoring program	Frequency	Responsibility	Records
Daily pre-start meeting	Daily	Contractor Site Manager	Daily pre-start record
Toolbox talks	As required to distribute significant project information or procedural changes	Contractor Site Manager Contractor HSE Advisor	Toolbox talk record
Environmental inspection	Weekly	Contractor HSE Advisor	Site inspection report
Erosion and sediment control devices	Prior to and following significant rainfall	Contractor HSE Advisor	Site inspection report
Environmental audits	As requested by the Planning Secretary	Contractor HSE Advisor Consultant Environmental Auditor	Audit report

6.2 Continual improvement

Continual improvement is part of any environmental management system. Continual improvement of this CEMP and construction of the project will be completed as part of the records and reporting process described in Section 4.5.

The continual improvement process will aim to:

– Identify areas of opportunity for improvement in environmental management and performance
– Determine the cause or causes of non-compliances and incidents
– Develop and implement a plan of corrective action to address any non-compliances and incidents
– Verify the effectiveness of the corrective actions
– Document any changes in procedures resulting from process improvement

6.3 CEMP review

This CEMP will be reviewed, and if necessary, revised following:

– Findings from incidents and non-compliances
– Findings from inspections and internal/external auditing processes
– Changes to project scope or construction methodology
– Requests from the Contractor, DGL or the Planning Secretary

As per Condition D4(b), DGL will need re-approval of the CEMP and sub-plans by the Planning Secretary following any updates.

Updated CEMP and subplans will be provided to the Contractor Project Manager, Site Manager, HSE Advisor and other stakeholders as relevant.

7. References

DPE. (1979). Environmental Planning and Assessment Act 1979 No 203. NSW.

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NSW EPA. (2001). NSW Waste Avoidance Recovery Act 2001.

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Planning Plus. (2022). *Unanderra Liquid Waste Treatment Facility (SSD 8304) - Request for Additional Information to Agency Submissions - Response to Submissions Report.* Planning Plus.

Wollongong City Council. (2009). Wollongong Local Environmental Plan.

Appendices

Appendix A

Construction traffic management plan

Unanderra Waste Treatment Plan

Construction Traffic Management Plan

DGL Group

28 November 2023

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P5896.001R Unanderra Waste Treatment Plant CTMP	T. Islam	A. Grey	A. Grey	17/11/2022	Jeremy Perera: jeremy@asylan.com.au
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P5896.003R Unanderra Waste Treatment Plant CTMP	A. Liu	A. Grey	A. Grey	28/11/2022	Keith Mau Keith.Mau@dglgroup.com

CONTENTS

Tables

Figures

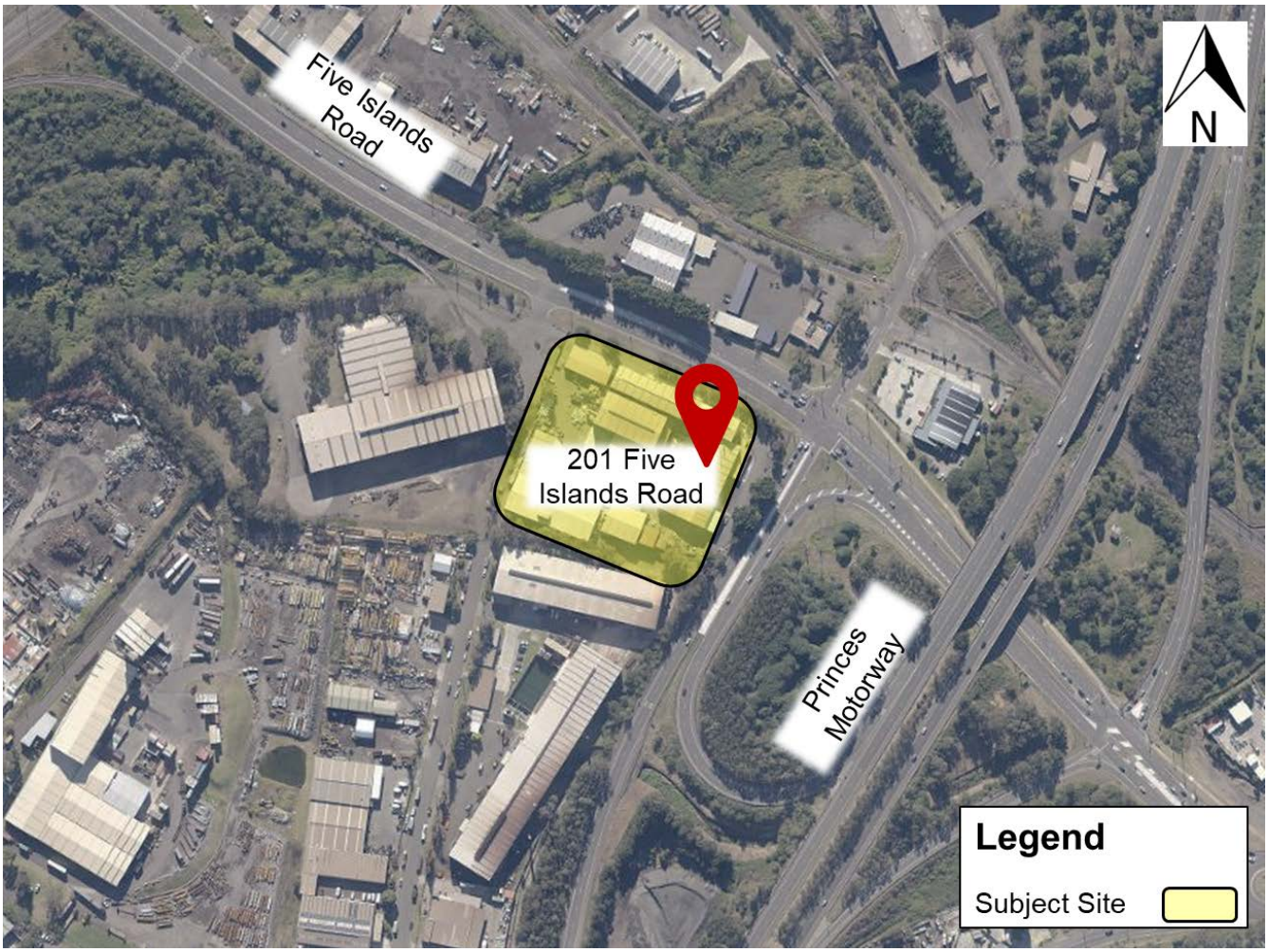
Appendices

1. INTRODUCTION

1.1 Background

Bitzios Consulting has been commissioned by DGL to prepare a Construction Traffic Management Plan (CTMP) for construction works proposed at 201 Five Islands Highway (subject site) for the Liquid Waste Treatment Plant (LWTP). This CTMP is required in accordance with Item 7 of the Secretary's Environmental Assessment Requirements (dated 9 September 2019) to accompany the State Significant Development (SSD) application (ref: *SSD 10365*).

The location of the subject site is illustrated in Figure 1.1.



Adapted from SIX Maps

Figure 1.1: Site Location

1.2 Purpose

The purpose of this CTMP report is to assess the impacts associated with construction activities, movements of construction vehicles to ensure the safety of the public and maintain an accessible and efficient road network for all users during the construction stage.

The document will guide through the requirements and measures that can / must be adopted in the event of any construction activity that has the likelihood of affecting the surroundings along with the road network.

2. EXISTING CONDITIONS

2.1 Existing Road Network

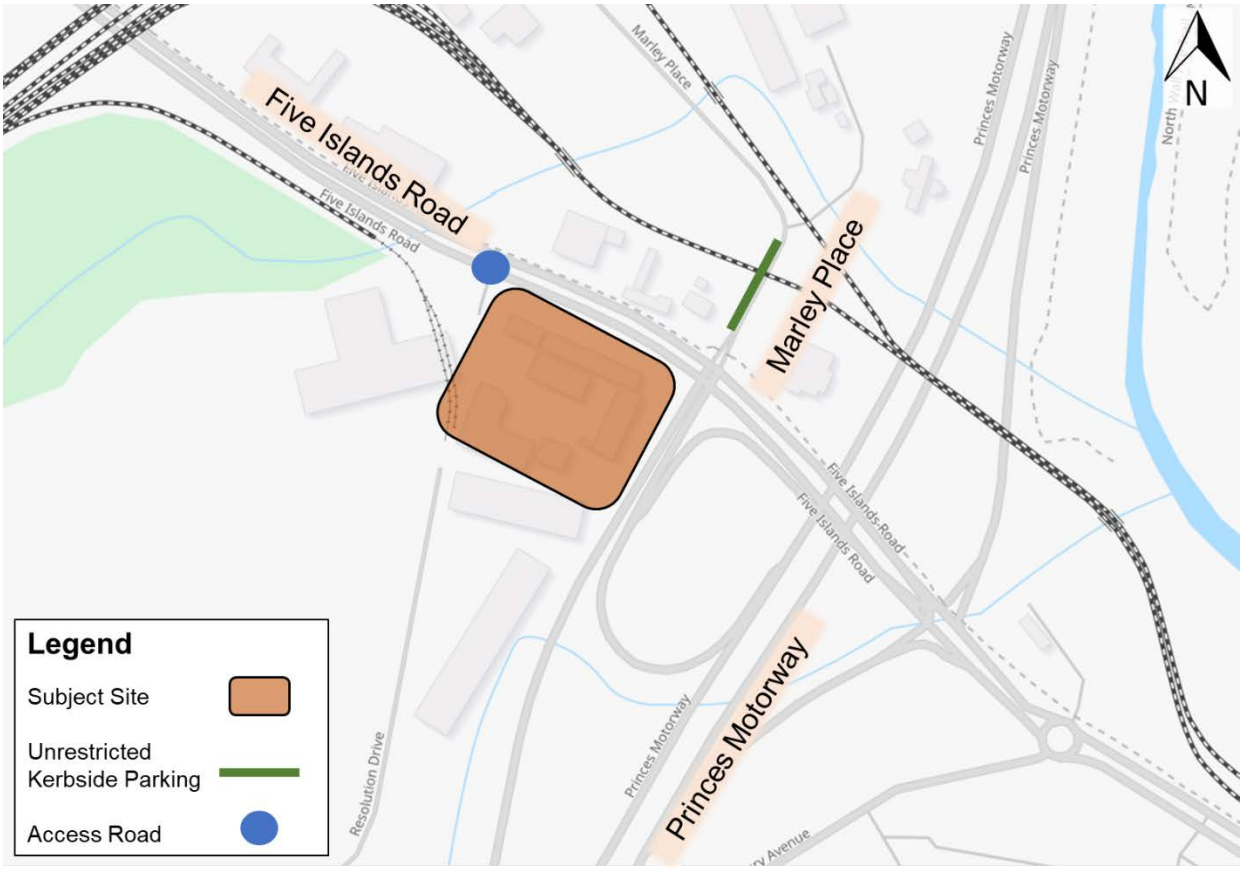
The key roads in the surrounding road network are summarised in Table 2.1.

Table 2.1: Existing Road Network

Road Name	Jurisdiction	Hierarchy	Cross Section	Speed Limit
Five Islands Road	State Road	Arterial Road	6 lanes divided	80 km/h
Princes Motorway	State Road	Expressway	5 lanes divided	100 km/h
Marley Place	Local Road	Local Road	2 lanes unbroken	50 km/h
Princes Highway	Regional Road / State Road	Highway	4 lanes divided	60 km/h

2.2 Public Parking

On-street unrestricted parking, proximity to the subject site, is available only along Marley Place, for northbound lane. The nearby on-street parking is shown in Figure 2.1.



Adapted from OpenStreetMap

Figure 2.1: On Street Parking

2.3 Alternative Transport

2.3.1 Train Service

The closest train station (Unanderra Train Station), providing train service to and from the subject site, is around 1.8 km away from the site.

2.3.2 Bus Service

There are no bus services along Five Highlands Road or Princes Motorway that are proximity to the subject site.

The nearest bus stops are available along Princes Highway, approximately 800m from the site are:

- Northbound
  - Princes Highway opposite of First Avenue (Stop ID 252624)
  - Immaculate Conception Catholic Church, Princes Highway (Stop ID 252623)
- Southbound
  - Princes Highway opposite of Chapman Street (Stop ID 252611)
  - Princes Highway at Third Avenue (Stop ID 252612)

The frequency and the service type have been summarised in Table 2.2 and bus routes are shown in Figure 2.2.

Table 2.2: Bus Service Frequency Along Princes Highway

Bus Route	Frequency	Type of Service
41	7 services per day (Monday to Friday)	One-direction
S093, S109, S093, S109, S114, S238	1 service per day (Monday to Friday)	School Bus
31, 33, 34, 36, 37	23 services per day (Monday to Friday) 16 services per day (Saturday) 8 services per day (Sunday and Public Holiday)	Loop Service

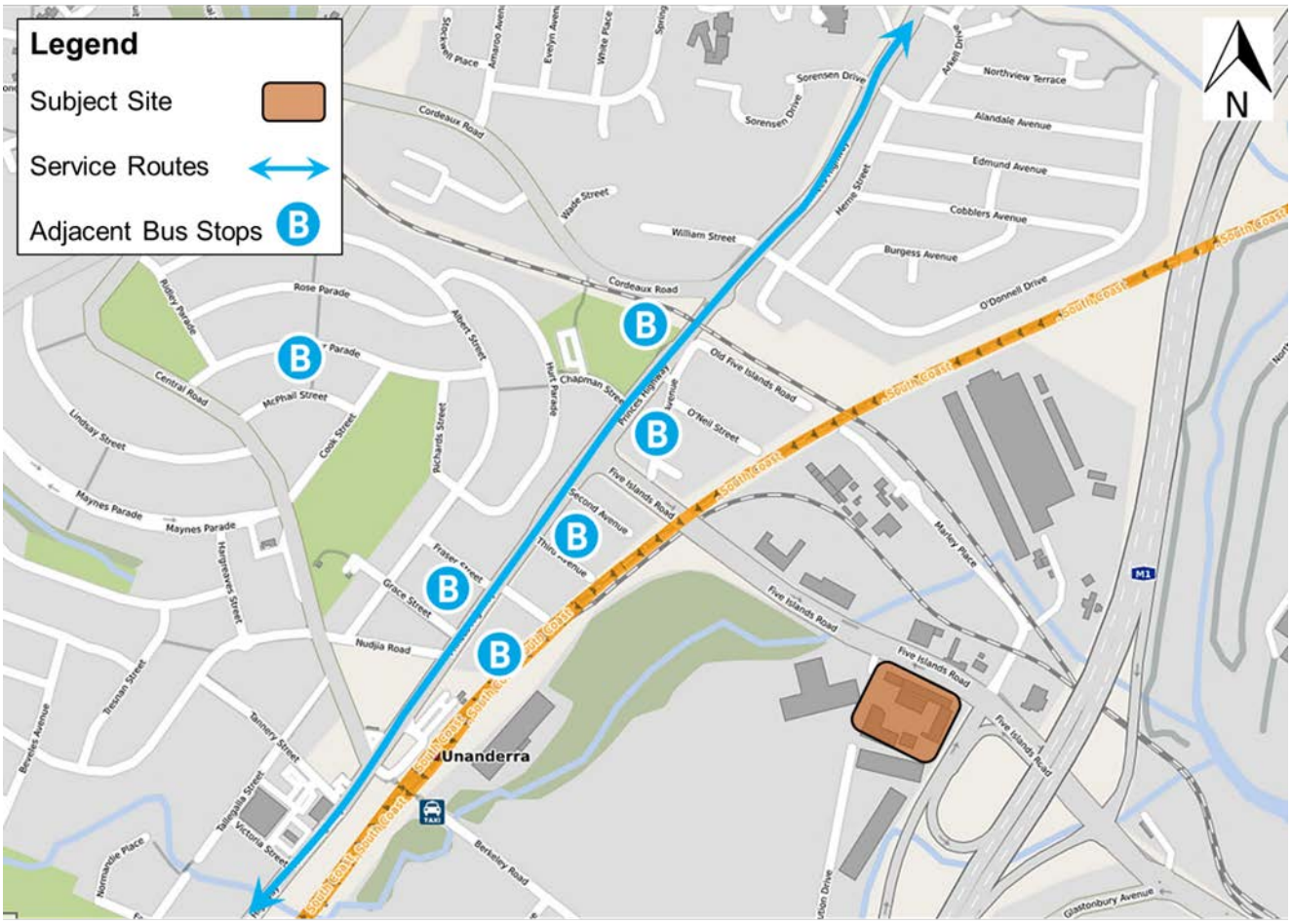
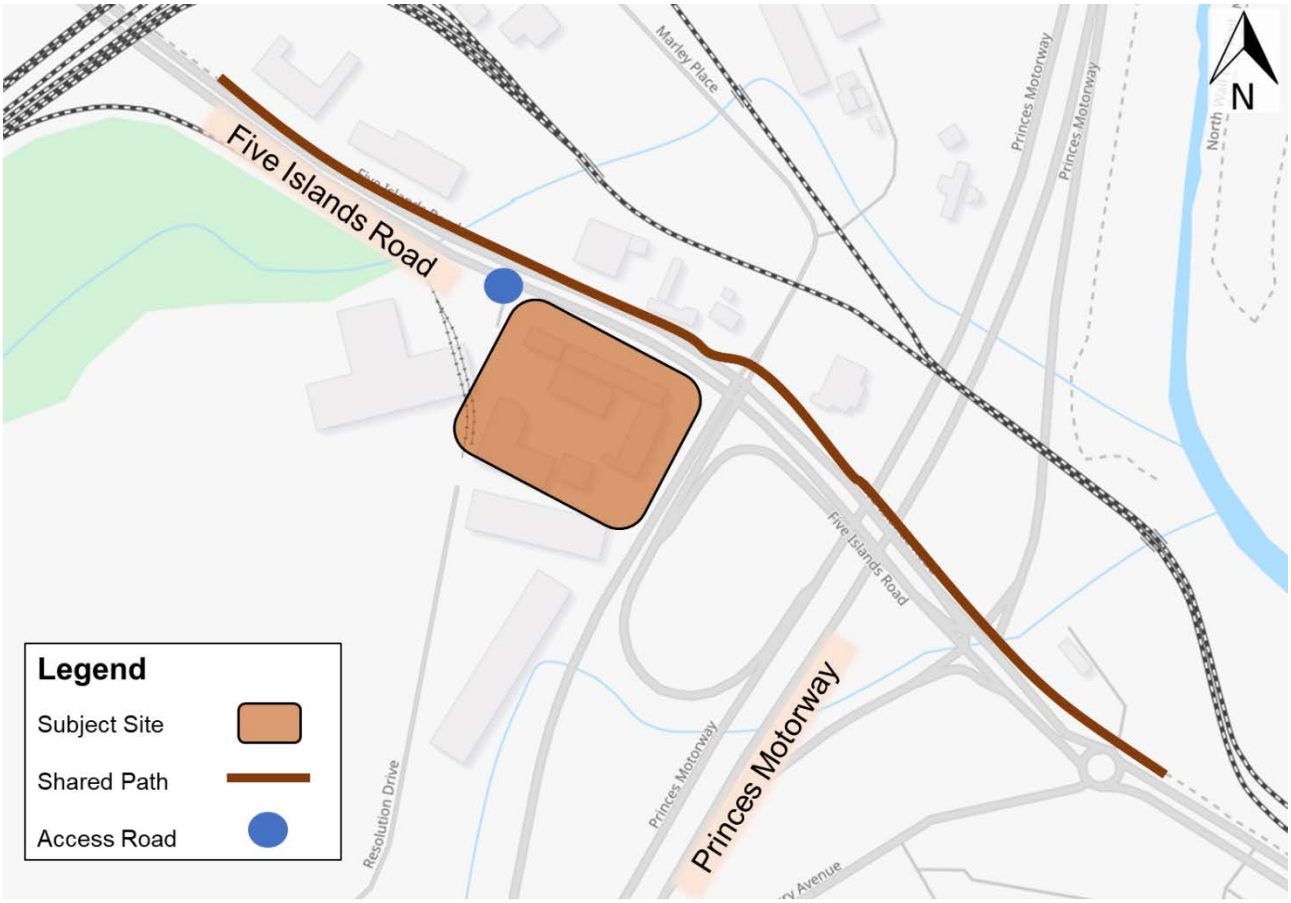


Figure 2.2: Bus Routes

2.3.3 Active Transport

Shared path is available along the northern side of Five Islands Road, opposite the subject site; However, no crossing facilities across Five Island Road are provided for direct cyclist and pedestrians access to the subject site in a safe and convenient manner. Moreover, footpath facilities are unavailable along the southern side of Five Islands Road near the subject area. Although active transport is available proximity to the subject site, there are no direct access to the site from the existing active transport infrastructure.

Shared path location is shown in Figure 2.3.



Adapted from OpenStreetMap

Figure 2.3: Shared Path Location

3. CONSTRUCTION ACTIVITIES

3.1 Description of Construction Activities

The construction activities will be undertaken as per the indicative schedule found on Table 3.1.

Table 3.1: Construction Activities and Timing

Activity	Tentative Start Date	Duration
Civil Works	February 2023	4 weeks
Plant Installation	March 2023	36 weeks

3.2 Construction Hours

Construction will be operating according to the following schedule:

- Weekday: Monday to Friday, 7:00 am to 6:00 pm
- Weekend: Saturday, 8:00 am to 1:00 pm.

3.3 Site Access

The site has only one driveway for access and egress which is also shared with the adjacent property located at 203 Five Island Road.

The main and only site access driveway is located on Five Islands Road as illustrated in Figure 3.1.

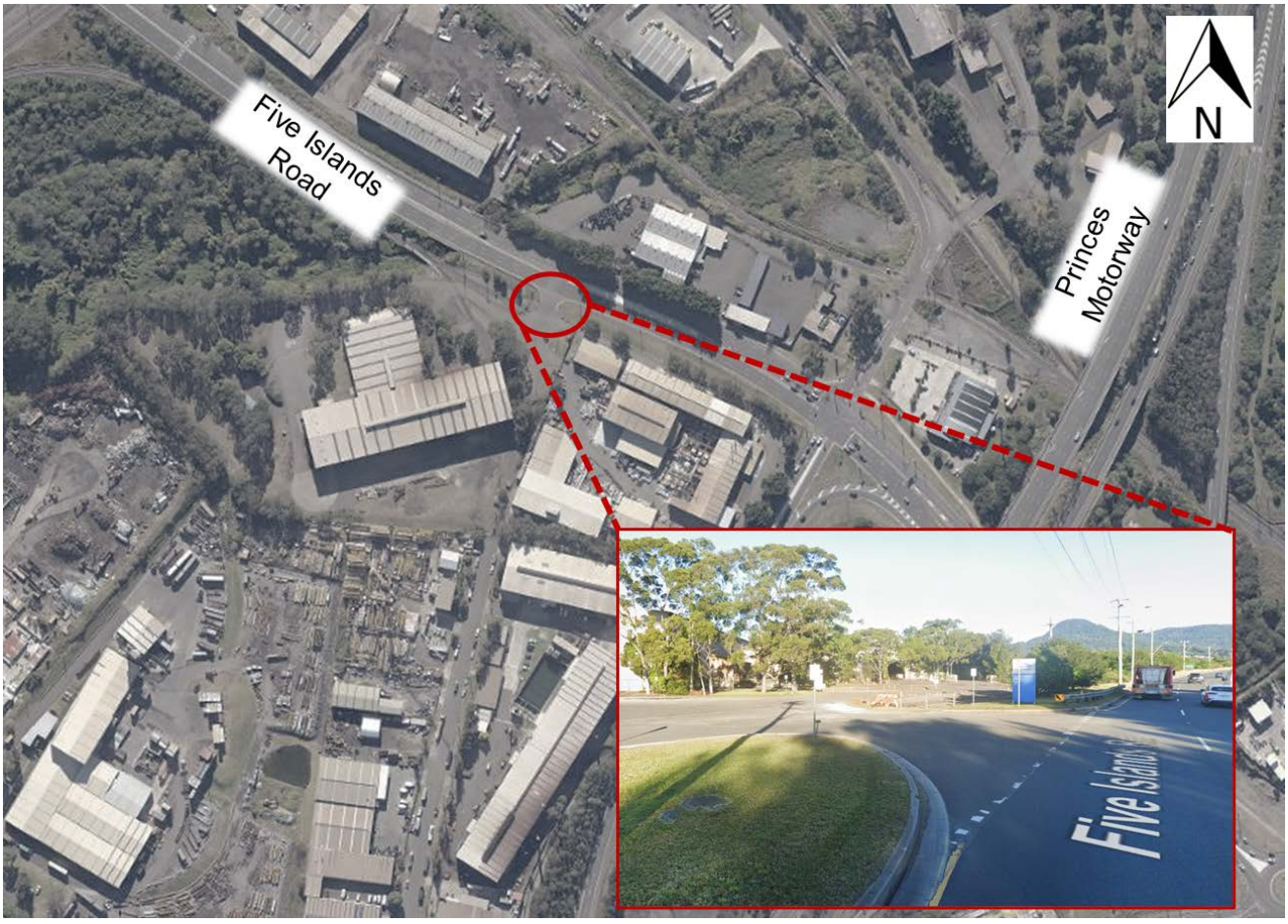


Figure 3.1: Site Access Location

3.4 Delivery, Loading and Unloading of Plant, Equipment and Materials

During all stages of the construction works, the loading and unloading and storage of all plant, equipment and/or materials will only occur within the site area.

In case of any changes to the construction stages or activities where loading, unloading and/or storage of any plant, equipment and/or materials is required outside of the site area or on the adjacent road, an appropriate application for a Work Zone or relevant Licencing should be made to the relevant road authority.

3.5 Construction Worker Parking

A total of 30 car parking spaces is available for staff and contractors within the subject site during construction. These are located at the following:

- 10 carparking spaces on the western property boundary
- 20 carparking spaces on the eastern property boundary

Figure 3.2 illustrates the location of the available parking spaces during construction stage:

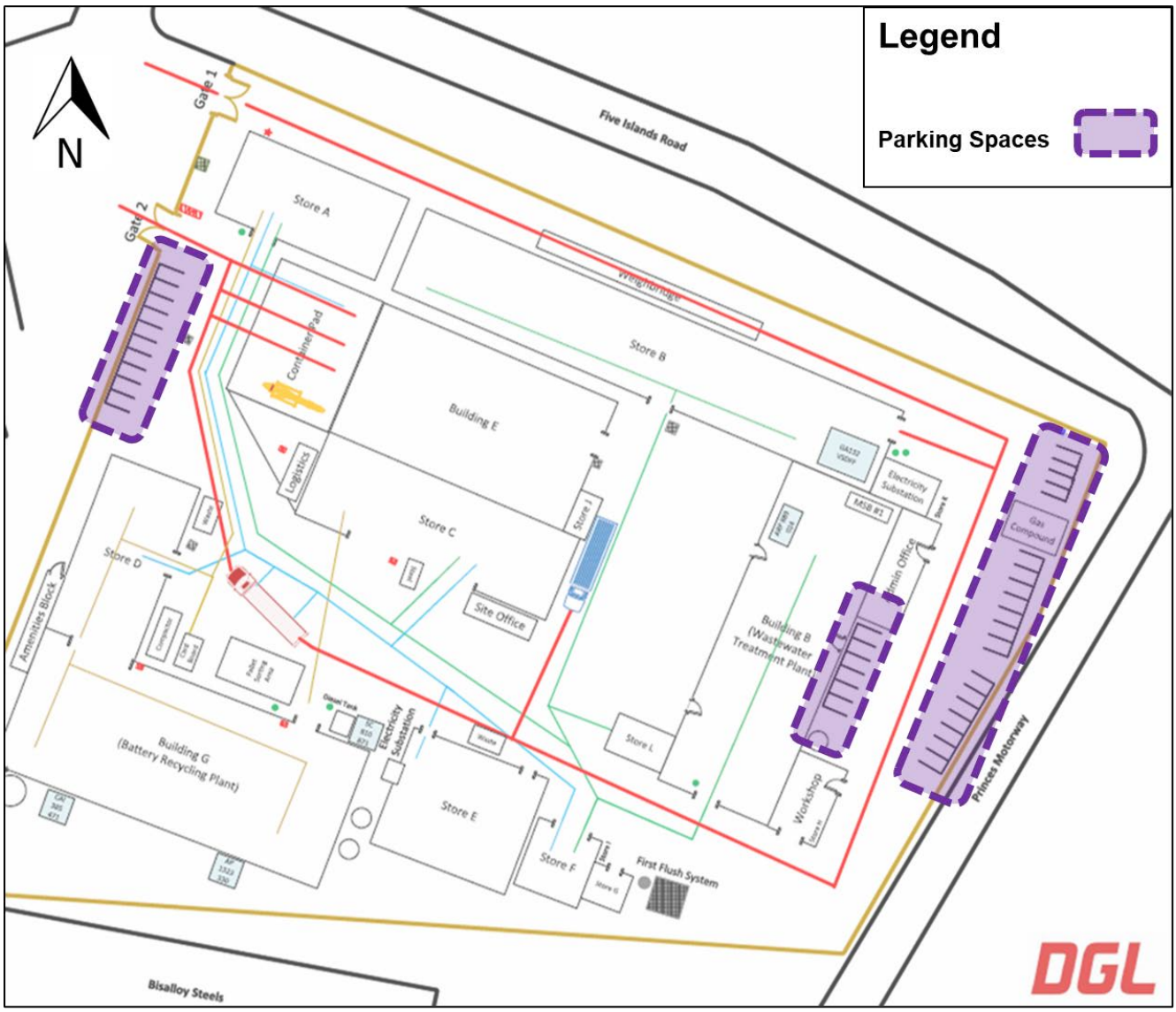


Figure 3.2: On-site Parking

3.6 Construction Worker Induction

All workers and subcontractors engaged on-site should be required to undergo a site induction. The induction should address elements related to traffic and transport management, including:

- Existence and requirements of the CTMP
- Relevant legislation, regulations and conditions (i.e. Workplace Health and Safety and emergency procedures)
- Roles and responsibilities
- Incident response, management, and reporting procedures
- Construction hours
- Access route
- Road safety
- Road occupancy
- Temporary and interim traffic arrangements

Informal training on traffic management should be undertaken during toolbox meetings with site personnel. This includes monitoring and reviewing the effectiveness of traffic control devices and mitigation measures.

3.7 SafeWork Requirements

To protect the safety of workers and the public, the work site should be adequately secured (i.e. security fence) and covered with proper warning signages to prevent access from unauthorised personnel at all times. Additionally, all works must be conducted at all times in accordance with the relevant SafeWork requirements.

3.8 Safe Work Method Statements

A Safe Work Method Statement (SWMS) should be compiled whenever any person is undertaking works on or adjacent to the public domain.

4. CONSTRUCTION TRAFFIC ASSESSMENT

4.1 Construction Traffic Generating Activities

An increase in traffic volumes is estimated during the construction phase as the result of commuting workers, deliveries of equipment and haulage of materials to and from the subject site. The following factors can be accounted for which the traffic generation will likely rise:

- The delivery and removal of construction machinery and materials, spoil and waste
- The movement of construction personnel including contractors, the project labour force, stakeholders visit and management staff.

4.2 Construction Vehicles

4.2.1 Local Haulage Routes

Construction vehicle movements are expected to occur between the site and Princes Motorway (and then to the broader network). Considering this, the haulage routes can be mapped out in the following ways:

- Construction traffic travelling from Princes Motorway northbound will access the site via the following route:
  - Exit vja the Princes Motorway southbound off-ramp
  - Proceed to turn right (westbound) from Five Islands Road / Marley Place
  - Enter the site from Five Islands Road by turning left into the driveway
- Construction traffic exiting from the site to Princes Motorway northbound following route:
  - Exit the site by turning right from the driveway onto Five Islands Road eastbound
  - Proceed to right turn from Five Islands Road / Marley Place onto Princes Motorway northbound on-ramp

It should be noted that all movements are to be in forward gear.

The proposed haulage route is shown in Figure 4.1 and detailed in **Appendix B**.

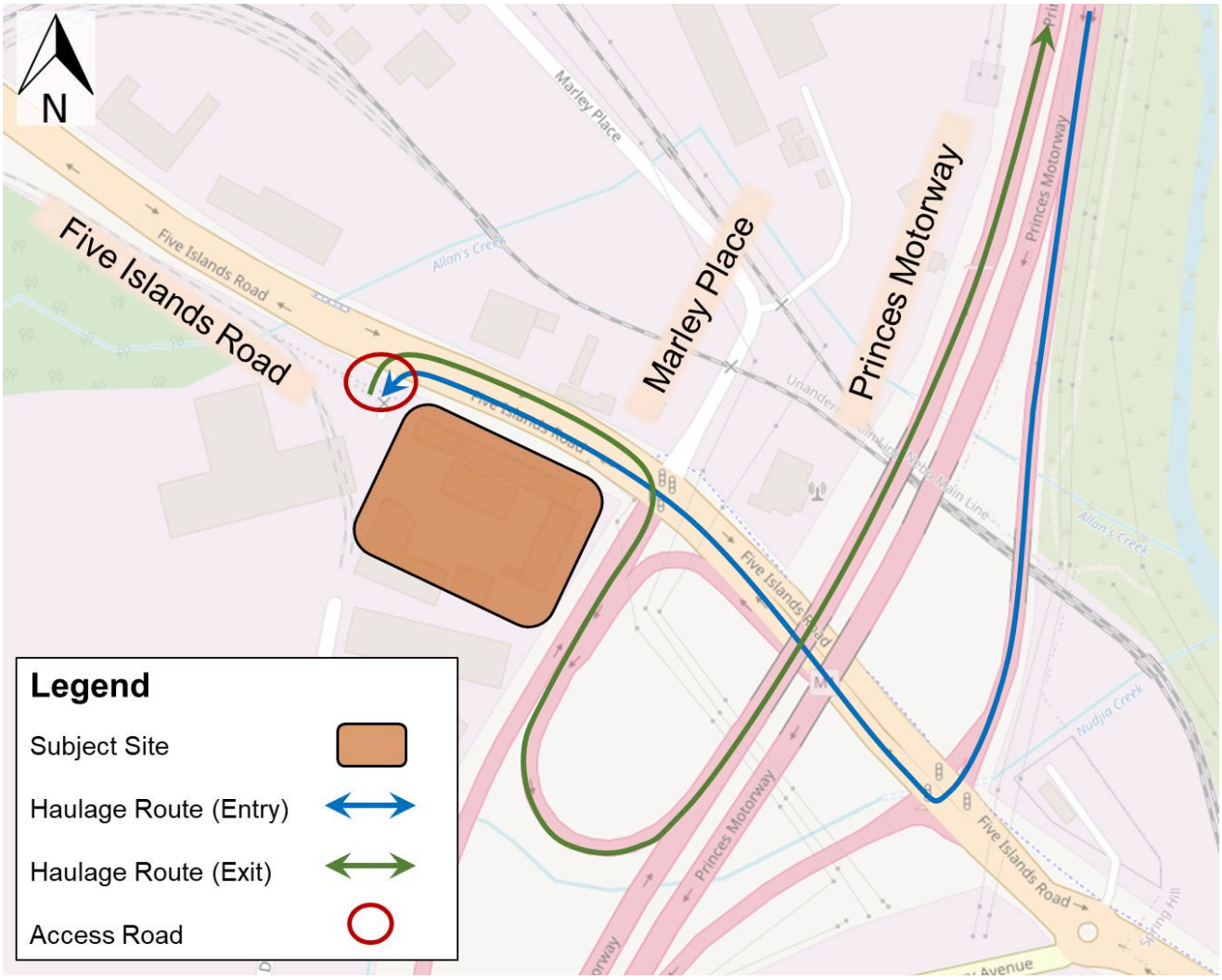


Figure 4.1: Haulage Routes

4.2.2 Swept Path Analysis

For critical access driveway and intersections along the haulage route, Swept Path analysis has been undertaken. A 19 m Articulated Vehicle (AV) was used for the Swept Path Analysis.

Results of the swept path analysis are summarised below, and detailed in **Appendix B**:

- 19 m AV exiting from the driveway access encroaches onto nearly two eastbound lanes along Five Islands Road, shown in Figure 4.2.
- 19 m AV will require sufficient gap before performing a right turn manoeuvre for travelling eastbound.
- General traffic may need to give way from both approaches at Five Islands Road to allow time for the 19 m AV to exit onto Five Islands Road.

From the above assessment, a 19 m AV can manoeuvre to and from the site, along the haulage route. It is recommended for the 19m AV to exit during off-peak time due to expected low vehicle numbers along Five Island Road.

It should be noted that a 25m B-double has been excluded from consideration. This is because B-doubles are not allowed under TfNSW's road rules and consent conditions.

Figure 4.2 illustrates the inbound and outbound manoeuvre of 19m AV at site-access.

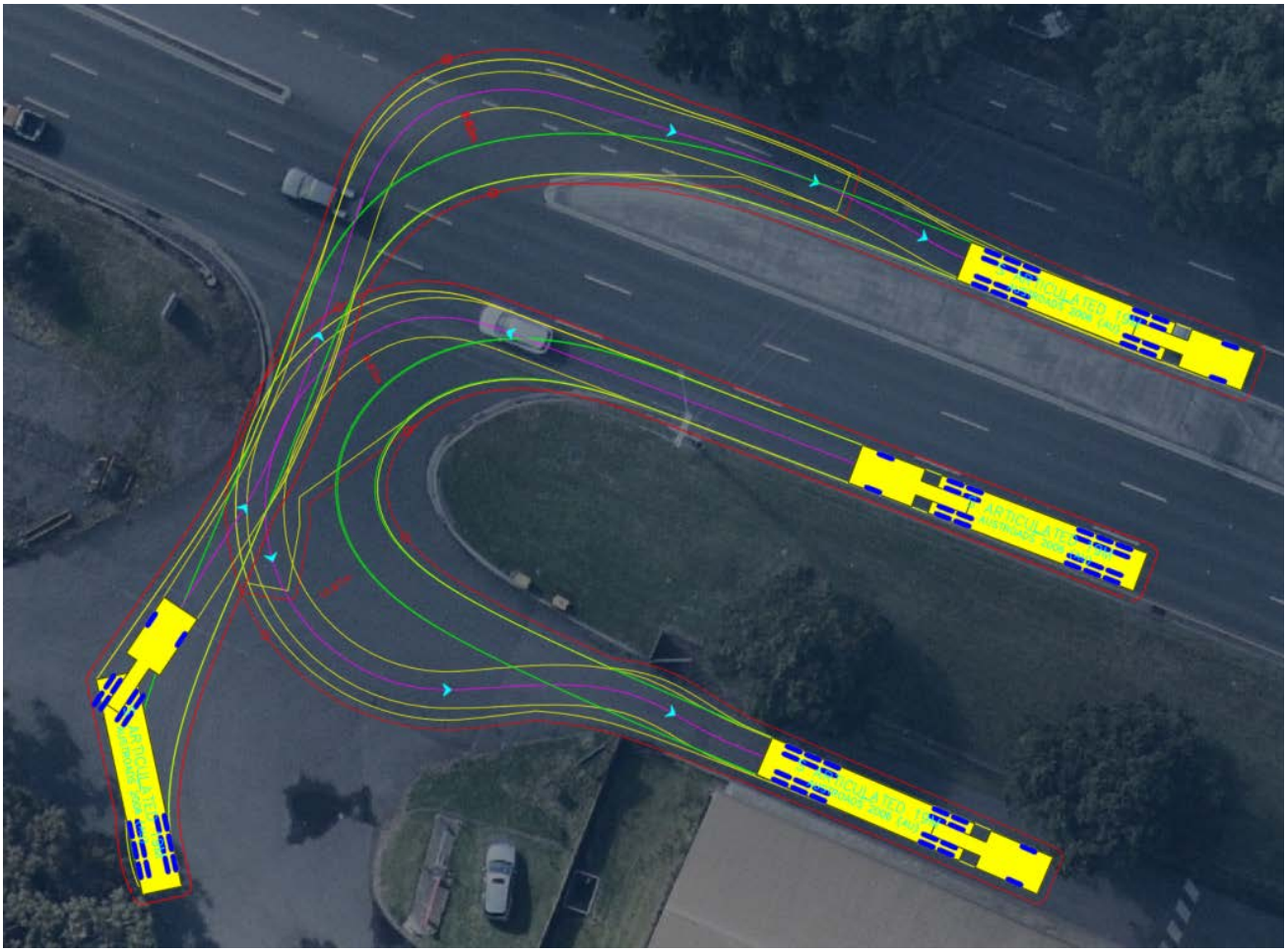


Figure 4.2: 19m AV Outbound and Inbound Manoeuvre at Site-access

4.2.3 Construction Vehicle Volumes

Construction traffic generated during the construction stages is expected to be up to eight (8) heavy vehicles. This consists of trucks for delivery and removal of equipment and materials, and removal of earth and waste.

4.3 Construction Traffic Impacts

4.3.1 Surrounding Road Network

The proposed truck volumes are expected to impact on the following intersections:

- Five Islands Road / Marley Place
- Five Islands Road / Princes Motorway off-ramp

Due to this, there will be potential safety issues relating to increased heavy vehicle turning movements. Furthermore, Construction activities associated with the projects may increase travel times and safety issues due to additional heavy vehicles movements.

To manage the traffic impacts associated with the project, deliveries and staff shift changes shall be scheduled outside of peak traffic periods. Truck arrivals and departures of heavy vehicles shall be programmed in a way that the timings do not conflict at the nearby intersections.

4.3.2 Staff Parking

During construction, it is expected that the number of personnel, including staff and contractors, is up to 30 personnel. As mentioned in Section 3.5, total of 30 off-street parking spaces is available within the site. As such, the provision of onsite parking spaces is sufficient for the expected maximum 30 personnel.

Construction staff are to be instructed to park within the site and to not occupy nearby parking spaces outside of the site.

4.3.3 Pedestrians and Cyclists

To minimise impacts on the existing pedestrian and cyclist facilities, the constructions work will be supported by the following measures:

- All loading / unloading activities will occur wholly within the subject site and no roads and areas beyond the construction the site will be occupied in this event
- Queuing and stalling of all heavy vehicles within the public road domain will not be permitted. If required, vehicles may only wait only within the subject site.

4.3.4 Bus Zones and Services

The nearest bus stop, as mentioned in Section 2.3, is located on Princes Highway, more than 900 m from the site. It is not expected that the construction works will have any adverse impacts on existing public transport services due to the proximity of the site to existing public transport facilities.

4.3.5 Property Access

The driveway access on Five Island Road is shared with the adjacent property, located on 203 Five Island Road. All construction activities are to be undertaken within the subject site, and not outside of the site, including the driveway access. As such, it is not expected that the construction will impact the driveway access for the adjacent property.

4.3.6 Emergency Services

The proposed construction activities are not expected to impact emergency services. Emergency services will have access to the site via the driveway access.

5. CONSTRUCTION TRAFFIC MANAGEMENT

5.1 Traffic Controllers

A Traffic Control Team must be used subcontracted to provide traffic control services during the construction phase of the project if need be. Traffic controllers will be required to be qualified, hold a current SafeWork NSW Traffic Control Work Training Card, and comply with the requirements of the Transport for NSW Traffic control at work sites (TCAWS) Technical Manual Issue 6.1 (February 2022).

5.2 Road Occupancy

An 'Application to Carry Out Works or Erect a Structure on or Over a Public Road' is required by Council where an activity requires an existing road to be occupied in such a way that affects traffic flow.

An application seeking approval must be lodged if any of the construction activities requires one or more of the following pre-requisites:

- Shoulder occupancies and/or closures
- Lane occupancies and/or closures
- Any other event that causes delays to traffic flows.

Applications should be submitted to the relevant authority at least 10 working days prior to the planned commencement of the activity requiring the Road Occupancy Licence. The activity must not commence until the approval has been obtained.

5.3 Stakeholder Consultation

5.3.1 Council

Condition B13 (b) of SSD-8304 states that the CTMP must 'be prepared in consultation with Council (Wollongong City Council)'. The CTMP was provided to Council on 21 November 2023 with a response received on 27 November 2023 stating that the CTMP was considered fit for purpose and satisfying Condition B13 (b).

A copy of the correspondence is provided in **Appendix C**.

5.3.2 Residents

Information should be supplied to residents in the vicinity of the subject site. The relevant information should comprise:

- Proposed works and details of the period of the day when the works will be undertaken
- Information on the timing i.e. commencement and finishing date of proposed works
- Impacts on the surroundings resulting from proposed construction activities (e.g. traffic conditions, pedestrian diversions or high level sound)

This information is to be provided via a flyer or letter delivered to local letterboxes.

5.3.3 Servicing

Both regular and intermittent servicers of the site must be notified of any changes to servicing times, locations, and procedures prior to and throughout the duration of construction.

6. MONITORING AND EVALUATION

6.1 Inspections and Monitoring

In addition to traffic control safety inspections, formal and documented daily (short-term) and weekly (long-term) inspections shall be undertaken at work sites by persons holding the Prepare Work Zone Traffic Management Plan qualification.

It is also important for any near miss incidents to be recorded and documented then reviewed as part of any inspection.

In the case of accidents, either witnessed or reported, involving the public or from which legal proceedings might arise, the actual type, size and location of signs, and devices in use at the time of the accident should be recorded and the sign arrangement photographed for subsequent reporting. The actual travelled path width and condition and weather conditions should also be recorded, as well as personal injury, extent of vehicle damage and vehicle details, such as registration.

6.2 Responsibilities

For all long-term work sites, the works supervisor who is appropriately qualified shall:

- Inspect the traffic control layout on the day before the work begins and at least once per week during the duration of the work
- Inspect the traffic control layout between shifts at least once during the first week and at least once every two months for the duration of work
- Review the reported near miss incidents
- Provide after-hours contact to local police for the duration of the work
- Inspect the site on the final day to ensure that unnecessary signs and devices are removed
- Record results of these inspections noting date, time, deficiencies, and any corrective action taken or specified
- Ensure that any specified corrective action is taken.

6.2.1 Works Supervisor

For all long-term work sites, the works supervisor who is appropriately qualified shall:

- Inspect the traffic control layout on the day before the work begins and at least once per week during the duration of the work
- Inspect the traffic control layout between shifts at least once during the first week and at least once every two months for the duration of work
- Review the reported near miss incidents
- Provide after-hours contact to local police for the duration of the work
- Inspect the site on the final day to ensure that unnecessary signs and devices are removed
- Record results of these inspections noting date, time, deficiencies, and any corrective action taken or specified
- Ensure that any specified corrective action is taken.

6.2.2 Team Leader

For all works, the team leader (or site supervisor) shall:

- Record start and finish times and location of the works

- Record near misses
- Carry out inspections before work starts, during the works and pre-closedown of the site using the nominated checklist, noting:
  - Date and time of inspection
  - Deficiencies identified and corrective action taken
  - Changes or modifications made to the site
- Periodically check that all signs and devices are satisfactory and in their correct position
- Make these records available to authorised staff.

6.2.3 Project Manager

The project manager shall:

- Ensure that a traffic control safety inspection is carried out at least once per month by a person qualified in Prepare Work Zone Traffic Management Plans and that the date, time and deficiencies are recorded
- Ensure that a traffic control safety inspection or road safety audit is carried out prior to the implementation of any changes in traffic control
- Ensure that team leader inspections of the site are carried out before work starts
- Ensure that near miss incidents are being reported and recorded then reviewed
- Ensure that any corrective action specified is taken and recorded.

This information may be critical, should legal proceedings follow an accident.

6.2.4 Drivers

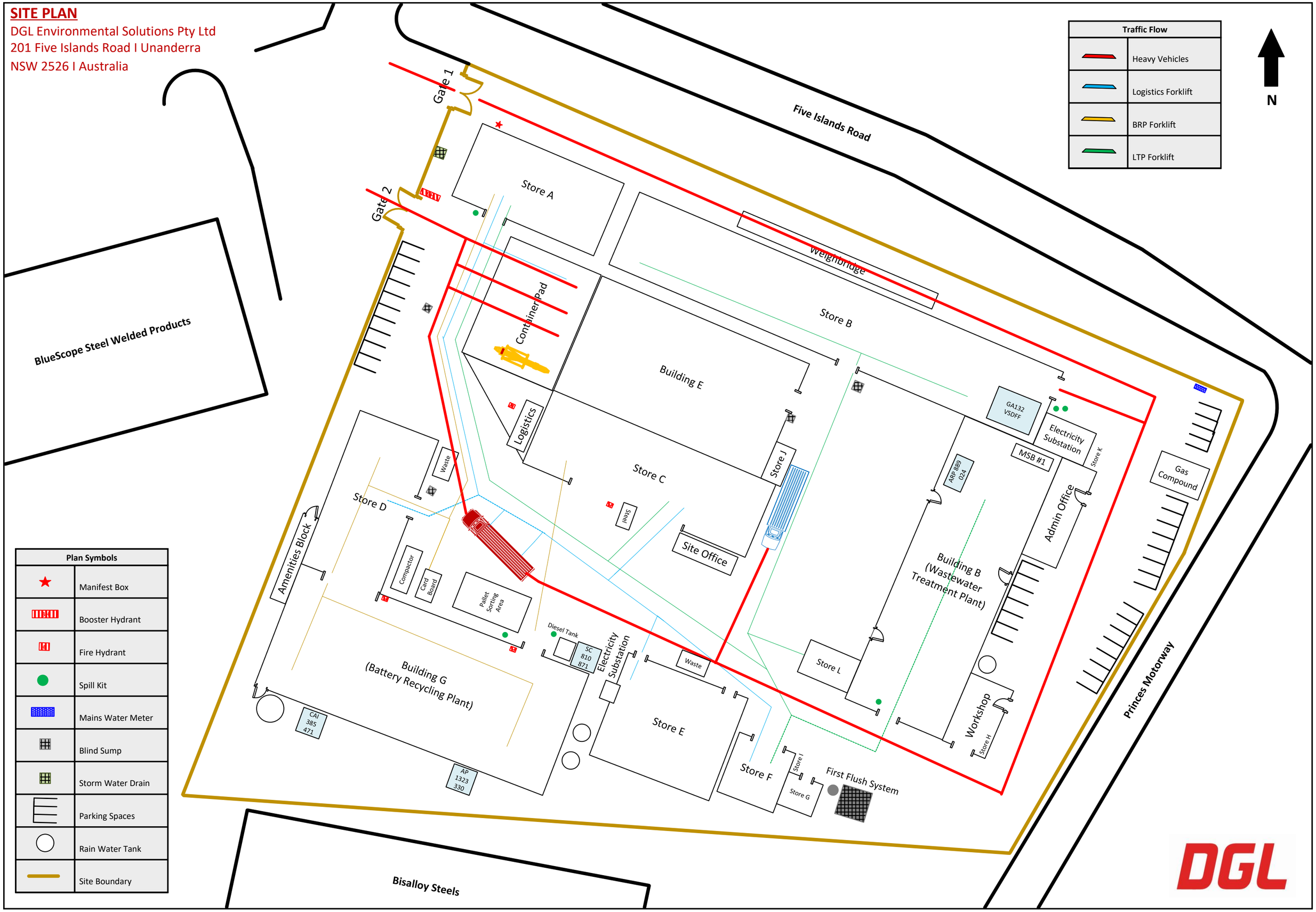
Drivers are to:

- Obey road rules at all times
- Follow the haulage routes defined in this CTMP or the site-specific CTMP
- Notify the site contact / escort of arrival
- Follow instructions from the site contact/escort, including directions to nominated laydown or holding areas
- After arriving at the nominated laydown area, exit the vehicle and remain in a predefined safe area while loading or unloading of plant, equipment and/or materials is undertaken
- Once unloading of the plant, equipment and/or materials has been completed, return to the vehicle and exit the site, following instructions from the site contact/escort and traffic controllers. The driver is then to follow the designated haulage routes
- Read, understand and follow this CTMP and any other relevant project documentation regarding road safety and traffic management.

Appendix A: Site Plan

SITE PLAN

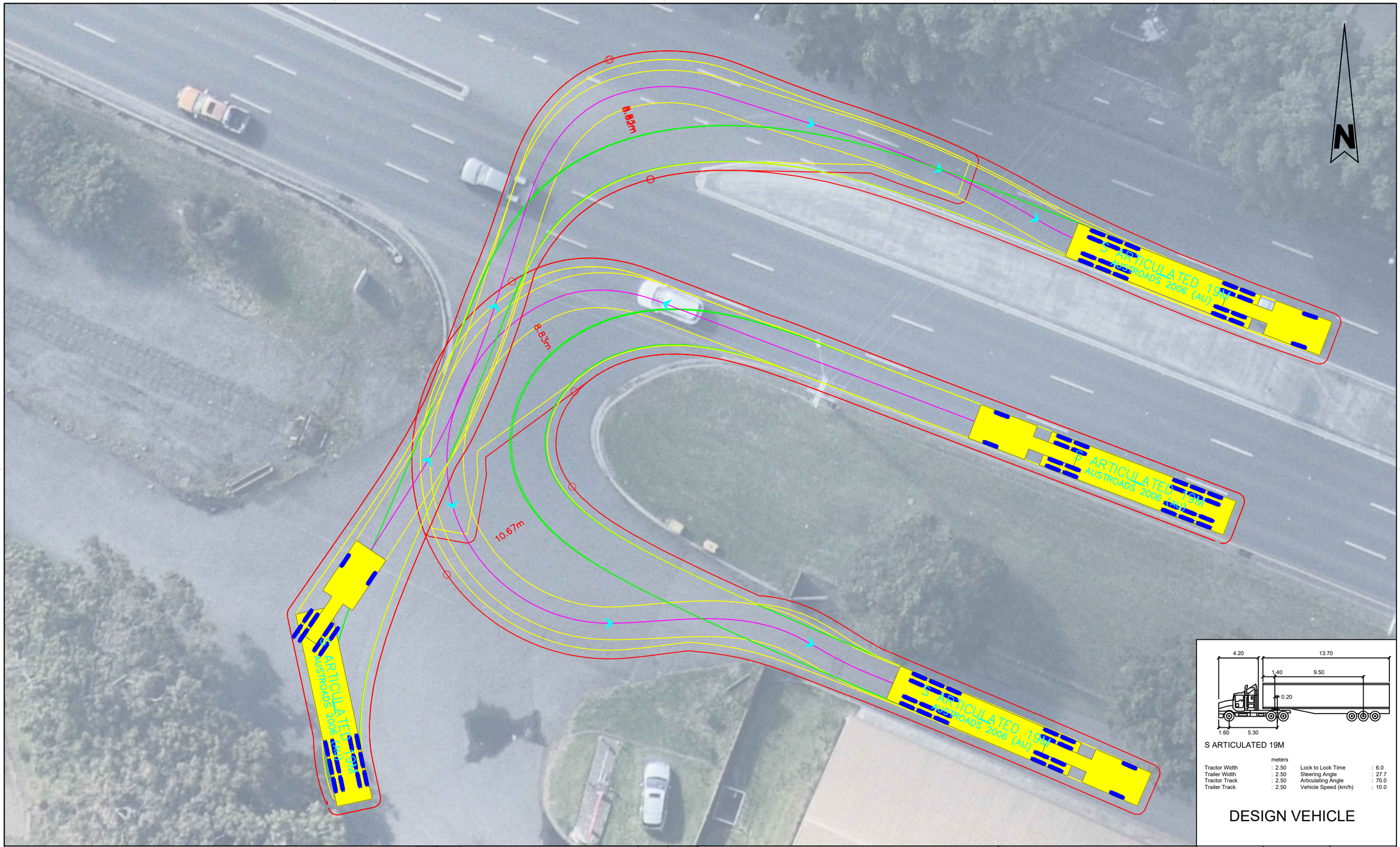
DGL Environmental Solutions Pty Ltd
201 Five Islands Road I Unanderra
NSW 2526 I Australia



Plan Symbols	
★	Manifest Box
	Booster Hydrant
	Fire Hydrant
●	Spill Kit
	Mains Water Meter
	Blind Sump
	Storm Water Drain
	Parking Spaces
○	Rain Water Tank
	Site Boundary

Issue Date: 16/09/2019 I **Ver.** 7.0

Appendix B: Swept Path Analysis



S ARTICULATED 19M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50	Vehicle Speed (km/h)	: 10.0

DESIGN VEHICLE

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH ANALYSIS	T.I	04.11.2022
002	SWEPT PATH ANALYSIS - UPDATED	T.I	07.12.2022

Scale @ A3 0 2 4 6 8 10 12 1:250

Project: UNANDERRA WASTE TREATMENT PLANT CTMP

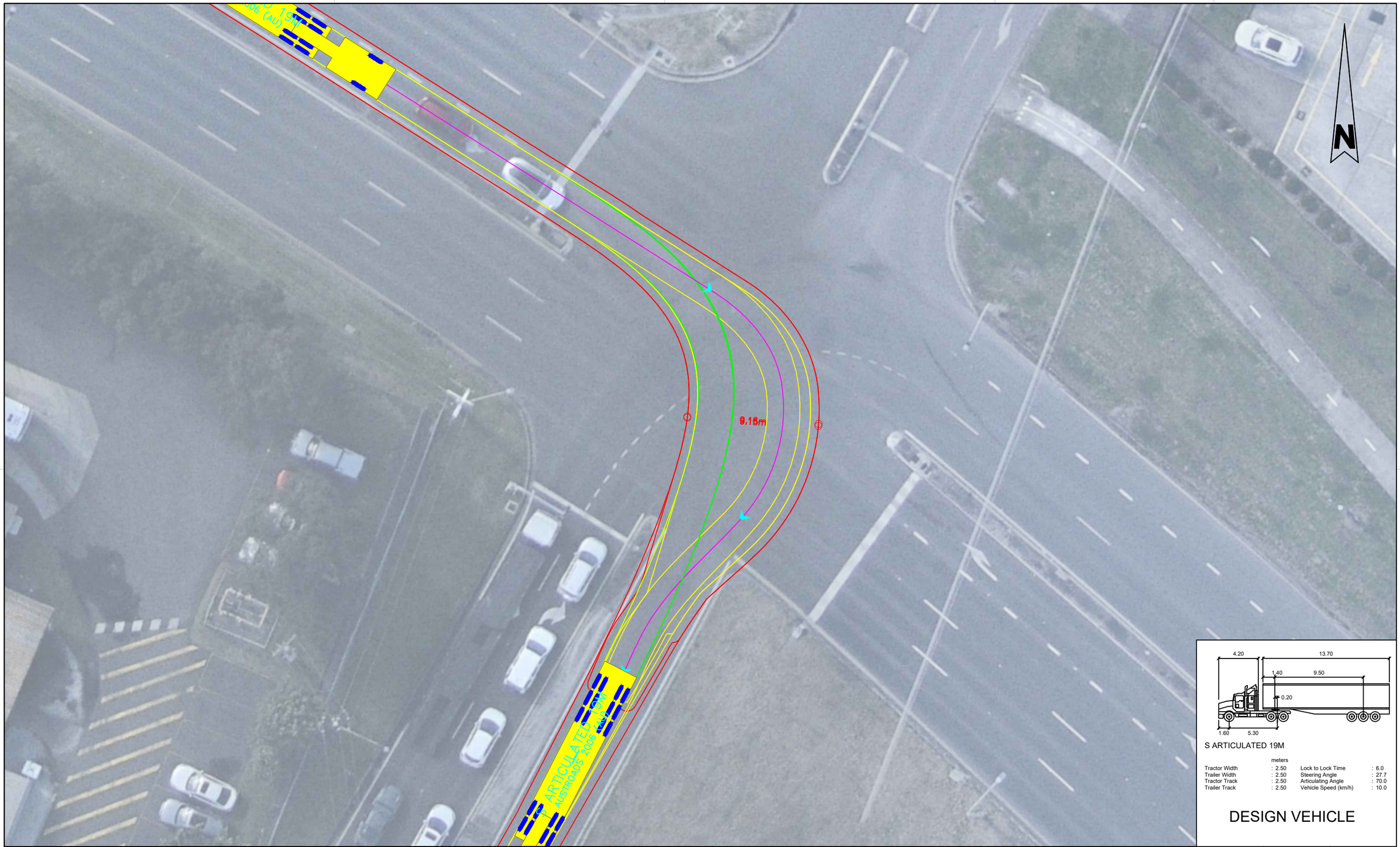
Title: SWEPT PATH ANALYSIS
FIVE ISLANDS ROAD
19M ARTICULATED VEHICLE
ACCESS AND EGRESS - MANOEUVRE

Design	Drawn	Checked
T.I	T.I	A.G

FOR INFORMATION ONLY

Date: 07.12.2022

Project Number	Sheet Number	Issue
P5896	1	002



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Trailer Track	: 2.50	Vehicle Speed (km/h)	: 10.0

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Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	SWEPT PATH ANALYSIS	T.I	04.11.2022
002	SWEPT PATH ANALYSIS - UPDATED	T.I	07.12.2022

Scale @ A3 0 2 4 6 8 10 12 1:250

Project: UNANDERRA WASTE TREATMENT PLANT CTMP

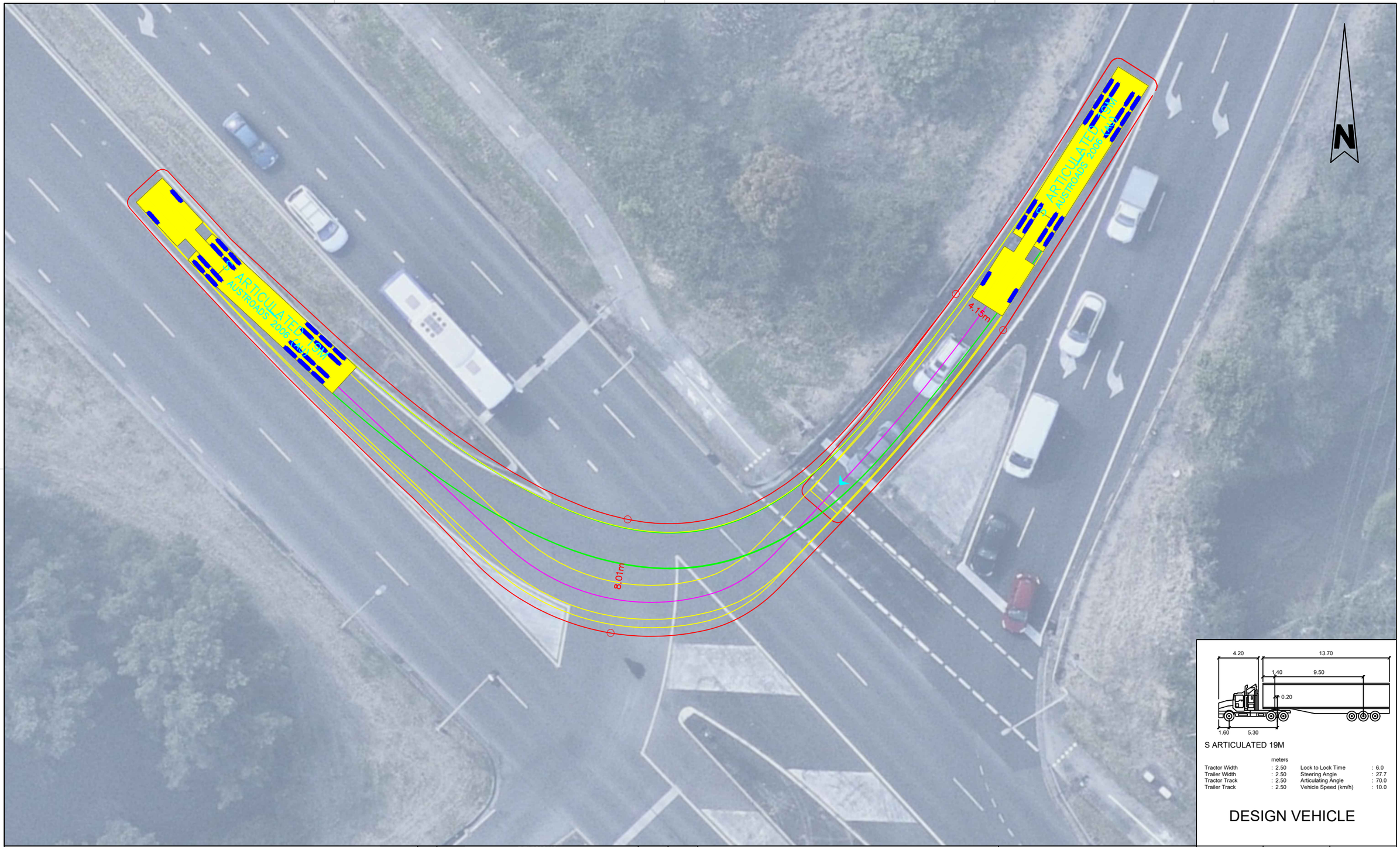
Title: SWEPT PATH ANALYSIS
FIVE ISLANDS ROAD (NORTHBOUND)
19M ARTICULATED VEHICLE
OUTBOUND - RIGHT TURN MANOEUVRE

Design	Drawn	Checked
T.I	T.I	A.G

FOR INFORMATION ONLY

Date: 07.12.2022

Project Number	Sheet Number	Issue
P5896	2	002



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	meters		
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Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50	Vehicle Speed (km/h)	: 10.0

DESIGN VEHICLE

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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	SWEPT PATH ANALYSIS	T.I	04.11.2022
002	SWEPT PATH ANALYSIS - UPDATED	T.I	07.12.2022

Scale @ A3 0 2 4 6 8 10 12 1:250

Project: UNANDERRA WASTE TREATMENT PLANT CTMP

Title: SWEPT PATH ANALYSIS
PRINCES MOTORWAY OFF RAMP
19M ARTICULATED VEHICLE
INBOUND - RIGHT TURN MANOEUVRE

Design	Drawn	Checked
T.I	T.I	A.G

FOR INFORMATION ONLY

Date: 07.12.2022

Project Number	Sheet Number	Issue
P5896	3	002

Appendix C: Wollongong City Council Correspondence

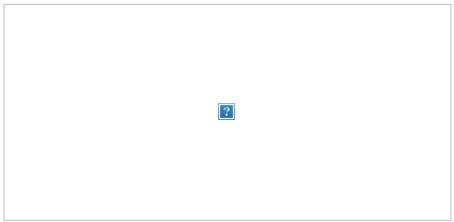
From: Andrew Heaven
To: Keith Mau; John Wood
Subject: RE: Unanderra Liquid Waste Treatment Facility CTMP DE-2018/65 Traffic Management Plan
Date: Monday, 27 November 2023 3:42:14 PM
Attachments: image009.png
image017.png
image018.png
image019.png
image021.png
image001.png
image002.png
image003.png
image005.png
image006.png

[External Email] This email was sent from outside DGL Group Ltd – be cautious, particularly with links and attachments.

Thanks John and Keith

With regard to SSD-8304, specifically condition B13, I have had a chance to review the provided Construction Traffic Management Plan Prepared by Bitzios Consulting dated 8th December 2022 and consider it fit for purpose.

Based on this I can confirm that Condition B13(b) has been satisfied.



Regards

Andrew Heaven | Development Engineering Manager
Phone +61242277258
Email aheaven@wollongong.nsw.gov.au | **wollongong.nsw.gov.au**

We acknowledge the Traditional Custodians of the land on which our city is built, the Aboriginal people of Dharawal Country.
We recognise and appreciate their deep connection to this land, waters and the greater community.

From: Keith Mau <Keith.Mau@dglgroup.com>
Sent: Monday, 27 November 2023 1:13 PM
To: John Wood <JWood@wollongong.nsw.gov.au>; Andrew Heaven <AHEAVEN@wollongong.nsw.gov.au>
Subject: RE: Unanderra Liquid Waste Treatment Facility CTMP DE-2018/65 Traffic Management Plan

[EXTERNAL EMAIL] This email was sent from outside of Wollongong City Council – be cautious, particularly with links and attachments.

Hi John,

Thanks for looking into this for us.

Andrew – Let me know if you have any questions.

Kind regards,

Keith Mau
General Manager
DGL Environmental
Unanderra Operations
201 Five Islands Road, Unanderra NSW 2526 Australia
p +61 2 4247 2100 **e** Keith.Mau@dglgroup.com
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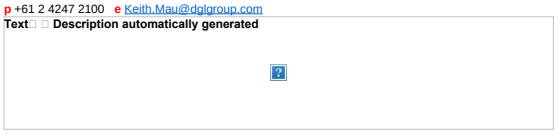

From: John Wood <JWood@wollongong.nsw.gov.au>
Sent: Monday, November 27, 2023 12:25 PM
To: Andrew Heaven <AHEAVEN@wollongong.nsw.gov.au>
Cc: Keith Mau <Keith.Mau@dglgroup.com>
Subject: FW: Unanderra Liquid Waste Treatment Facility CTMP DE-2018/65 Traffic Management Plan

[External Email] This email was sent from outside DGL Group Ltd – be cautious, particularly with links and attachments.

Andrew,

If you could arrange for a review when you get a chance and advise Keith.

Council's container ref as above.

Thanks

John Wood | City Wide Development Manager
Phone +61242277365
Email jwood@wollongong.nsw.gov.au | **wollongong.nsw.gov.au**

We acknowledge the Traditional Custodians of the land on which our city is built, the Aboriginal people of Dharawal Country.
We recognise and appreciate their deep connection to this land, waters and the greater community.

From: Keith Mau <Keith.Mau@dglgroup.com>
Sent: Tuesday, 21 November 2023 11:28 AM
To: Records <Records@wollongong.nsw.gov.au>
Subject: Unanderra Liquid Waste Treatment Facility CTMP

[EXTERNAL EMAIL] This email was sent from outside of Wollongong City Council – be cautious, particularly with links and attachments.

To whom this may concern,

As part of DGL's development consent for the Unanderra Liquid Waste Treatment Facility SSD-8304, a Construction Traffic Management Plan was put together by Bitzios Consulting.

This plan should have been prepared with consultation with Wollongong Council but there was a misunderstanding with the consultant and we thought the consultation was done in the background concurrently as it was prepared but this wasn't the case.

Could you please review attached CTMP and advise if there are any comments, amendments or changes from the council?

Kind regards,

Keith Mau
General Manager

DGL Environmental
Unanderra Operations
201 Five Islands Road, Unanderra NSW 2526 Australia
p +61 2 4247 2100 **e** Keith.Mau@dglgroup.com
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Appendix B

Erosion and sediment control plan

Unanderra Liquid Waste Treatment Facility

Erosion and Sediment Control Plan

DGL Environmental Pty Ltd

21 March 2023

→ **The Power of Commitment**

Project name		Unanderra Liquid Waste Treatment Facility CEMPUnanderra Liquid Waste Treatment Facility CEMP					
Document title		Unanderra Liquid Waste Treatment Facility | Erosion and Sediment Control Plan					
Project number		1259512612595126					
File name		12595126-REP_Unanderra Liquid Waste Treatment Facility_ESCP.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	T Jefferys	D Scott N Alexander		C Quayle	On file.	21/03/23

GHD Pty Ltd | ABN 39 008 488 373

133 Castlereagh Street, Level 15

Sydney, New South Wales 2000, Australia

T +61 2 9239 7100 | **F** +61 2 9475 0725 | **E** sydmail@ghd.com | **ghd.com**

Contents

Table index

Figure index

Appendices

Abbreviations and definitions

Abbreviation	Definition
AHD	Australian Height Datum
ASRIS	Australian Soil Resource Information System
BRP	Battery Recycling Plant
BOM	Bureau of Meteorology
CBD	Central Business District
CDWMP	Construction and Demolition Waste Management Plan
DGL	DGL Environmental Pty Ltd
DPE	NSW Department of Planning and Environment
EC	Electrical Conductivity
ESC	Erosion and sediment control
ESCP	Erosion and Sediment Control Plan
ESP	Exchangeable Sodium Percentage
FFL	Finish floor level
GHD	GHD Pty Ltd
IECA	International Erosion Control Association
LWTP	Liquid Waste Treatment Plant
ULAB	Used lead acid battery
WTP	Wastewater Treatment Plant

1. Introduction

1.1 General

DGL Environmental Pty Ltd (DGL) own and operate a Battery Recycling Plant (BRP) and a Wastewater Treatment Plant (WTP) on the site at No. 201 Five Islands Road, Unanderra, NSW (Lot 3 DP 259921). The site occupies an area of approximately 2 hectares (ha). Unanderra is 4.6 km south-west of the Wollongong Central Business District (CBD). The site is approximately 3 km west of Port Kembla on the western side of the M1 Princes Motorway and the southern side of Five Islands Road.

Figure 1.1 Site Locality Plan

DGL's current commercial activities comprise used lead acid battery (ULAB) recycling and waste management services focusing on liquid and solid waste treatment, recycling, and disposal.

DGL is constructing a new Liquid Waste Treatment Plant (LWTP) within Building E on the site. The proposed LWTP will process 56,500 tonnes per annum (tpa) of liquid waste including 8,500 tpa of liquid waste from metal processing and 48,000 tpa of battery acid and wastewater.

The project involves construction of a new LWTP to replace the existing WTP on site. The new plant will continue to process battery acid and wastewater from the BRP but also to process new waste streams from industrial facilities in nearby Port Kembla including aluminium extrusion and galvanising industry.

1.2 Scope and purpose of this report

1.2.1 Basis of Erosion and Sediment Control Plan

DGL engaged GHD Pty Ltd (GHD) to prepare this Erosion and Sediment Control Plan (ESCP) to be implemented during the construction of the new LWTP. This ESCP has been developed to address the requirements of Condition D3(b) of SSD-8304 and *Post-Approval Guidance: Environmental Management Plan Guideline – Guideline for Infrastructure Projects* ((DPE, 2020)) to establish erosion and sediment control (ESC) measures for the Project during the construction. Construction must not commence until the Planning Secretary of NSW DPE approves the Construction Environmental Management Plan (CEMP) including this ESCP. The ESCP considers the scope of works based on the following documents:

– *Proposed Liquid Waste Treatment Plant Environmental Impact Statement (EIS)* (Planning Plus, 2021a)
– *Proposed Liquid Waste Treatment Plant SSD 8304 Response to Submissions Report* (Planning Plus, 2021b)
– *Unanderra Liquid Waste Treatment Facility (SSD- 8304) - Request for Additional Information to Agency Submissions – Response to Submissions Report* (Planning Plus , 2022),Responsibility for ESC during construction lies with the Contractor Project Manager. This ESCP will be included in the Project documentation to be provided to DGL for review as guidance and provide greater detail on construction methodology and timing of works.

This ESCP provides guidance on the types and location of controls to be used by the Contractor. These sizes and locations should be determined on-site where they fit with the localised flow of the surface water and represented on a site specific ESCP drawing. This is one measure of meeting the Contractor's responsibilities to manage soil disturbance and sediment risks. This ESCP has been developed with control measures that are commensurate with the risk, that is minimal soil disturbance.

As a minimum, the Contractor should comply with the Landcom (2004), Managing Urban Stormwater: Soils and Construction, 4th edition and the International Erosion Control Association's (IECA) Best Practice Erosion and Sediment Control Guidelines (IECA, 2008) to:

– Identify site constraints
– Develop adaptive measures to cater for constraints and environmental sensitivities before, during and following the construction phase
– Identify, implement, and manage erosion hazards associated with any on-site land disturbance activity
– Demonstrate that the erosion and sediment controls meet best practice requirements during construction works to preserve surrounding environmental values

1.2.2 Proposed development

Refurbishment of Building E will need to be undertaken to make it fit for the purpose of the LWTP. There will be no major structural changes to the roof or walls of Building E. The refurbishment will include:

– Construction of a new concrete floor on top of the existing concrete floor
– Construction of a new concrete block perimeter bunding
– New sumps and drains
– New concrete ramps
– New electrical services

All process equipment will be located inside bunds that have been designed to contain 110% of the volume of the largest tank. All floors, bund walls and sumps will be coated with an epoxy resin product to prevent corrosive chemicals from attacking the concrete and leaching into the soil.

Therefore, based on our understanding of the proposed construction methodology sections of the concrete floor in Building E will be demolished and localised excavation works undertaken for the installation of channel drains and foundations for process plant, with a 200 to 300mm concrete layer laid over the entire floor area for strength and additional capping. Therefore, there will be limited soil disturbance and surface water runoff. The ESCP will focus on stockpiling of small quantities of spoil, protection of existing stormwater systems and management of concrete wash out. However, DGL has advised GHD that the proposed development of the LWTP will not include any subsurface intrusion as the structure will be built upon a raised concrete plinth founded within the concrete footings of the building. The inclusion of the concrete plinth was to satisfy a Council development consent condition which required that the finished floor level (FFL) within Building E is to be raised to RL 10.34 m Australian Height Datum (AHD), which is approximately 1 m above the current FFL.

If the scope of the development changes and more significant soil disturbance is required, site-specific soil testing should be undertaken by the Contractor to ensure adequate identification and treatment (if required) of soil is conducted.

1.3 Conditions of approval

The conditions of SSD-8304 applicable to the Erosion and Sediment Control Plan are outlined in Table 1.1.

Table 1.1 Conditions of SSD-8304

Item/Condition	Requirements	Document reference
B1	Prior to the commencement of any construction or other surface disturbance associated with the LWTP, the Applicant must install and maintain suitable erosion and sediment control measures on-site, in accordance with the relevant requirements of the Managing Urban Stormwater: Soils and Construction - Volume 1: Blue Book (Landcom, 2004) guideline and the Erosion and Sediment Control Plan included in the CEMP required by condition D2.	This plan
D1	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include: (a) detailed baseline data.	Section 2
	(b) details of: (i) the relevant statutory requirements (including any relevant approval, licence, or lease conditions). (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures.	Section 3.2 of CEMP
	(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria.	Sections 4.7 and 4.8 of CEMP
	(d) a program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to paragraph above.	Section 3
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.	Section 4
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time.	Section 4.2

Item/Condition	Requirements	Document reference
	(g) a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria). (ii) complaint. (iii) failure to comply with statutory requirements; and	Section 4 Section 4.7 of CEMP Section 4.7 of CEMP Section 4.8 of CEMP
	(h) a protocol for periodic review of the plan.	Section 6
D3	As part of the CEMP required under condition D2 of this consent, the Applicant must include the following: (a) Construction Traffic Management Plan. (b) Erosion and Sediment Control Plan. (c) Construction and Demolition Waste Management Plan; and (d) Unexpected Finds Protocol	 - This plan - -

1.4 Limitations

This report has been prepared by GHD for DGL Environmental Pty Ltd and may only be used and relied on by DGL Environmental Pty Ltd for the purpose agreed between GHD and DGL Environmental Pty Ltd as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than DGL Environmental Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect.

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

GHD has prepared this report on the basis of information provided by DGL Environmental Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Site specific characteristics

All information in this section was gathered from client information or publicly available data. This was used in the preparation and guidance of the development of the ESCP.

All operational areas of the site are hard stand (asphalt pavement) impervious surfaces with bunded areas. The site has a <1% grade that slopes towards the northeast of the project site and is approximately 9 to 10 m above Australian Height Datum (AHD).

2.1.1 Weather characteristics

Daily rainfall data was gathered from BOM's (2022) Port Kembla (BSL Central Lab, 068131) rainfall station, located approximately 4 km to the south-east of the site. This data is summarised in Table 2.1. The average annual rainfall is 1096.7 mm. Rainfall is generally greater in the autumn and winter months.

Table 2.1 Weather data 1963-2022 from Port Kembla

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	96.3	129.7	143.9	106.0	79.5	116.2	52.5	71.6	56.5	85.3	85.2	72.7
Median	80.8	95.2	105.0	58.1	56.4	79.6	37.5	31.0	48.7	63.4	79.8	60.8
Highest Daily	317.6	380.3	582.4	492.2	430.9	623.4	219.2	626.0	206.2	316.4	301.6	277.2

2.1.2 Catchment, waterways and drainage

Nudjia Creek 150 m to the south, Allans Creek 100 m to north-west, these two water ways eventually discharge into Port Kembla Inner Harbour located approximately 3 km east of the site. Historically, a drainage line or tributary existed in the northern portion of the site.

The ground surface at the site is generally occupied by buildings and asphalt pavement. Information obtained during previous GHD investigations (GHD, 2021) indicates that, where possible, rooftop run-off is captured for use and treatment on-site before permitted discharge into the sewer system. Surface water across the site that is not captured is likely to run off hard surfaces and enter stormwater systems or penetrate exposed soils on the edges of the site. It is anticipated that all water that is not captured for use and discharged via the sewer is likely to eventually discharge to the north-west into Allans Creek, approximately 100 m in this direction.

3. Implementation and operation

3.1 Roles and responsibility

Section 4.1 of the CEMP outlines roles and responsibilities for construction of the LWTP. Table 3.1 outlines the responsibilities of project personnel specific to the ESCP.

Table 3.1 Project personnel responsibilities

Who	What
All staff including contractors	– Complete a site induction prior to commencement of work – Implement and comply with this ESCP – Report any activity that has resulted in, or has the potential to result in, an environmental incident to their Supervisors – Attend any additional environmental training provided
DGL Project Manager	– Oversee implementation of this ESCP, and ensure that environmental requirements are not secondary to other construction requirements – Endorse and support the DGL environmental management system and policy – Participate and provide guidance in the regular review of this plan – Provide adequate resources (personnel, financial and technical) to ensure effective development, implementation and maintenance of this plan – Liaise with relevant government authorities, as required, including incident reporting and investigation – Undertake Contract Management, ensuring all obligations are met for the project – Obtain all site approvals before construction commences
Contractor Project Manager	– Oversee implementation of ESCP – Lead by example – develop a 'one team-one culture' and 'beyond compliance' culture within the team – Provide necessary resources and technical support for implementation of ESCP – Ensure non-conformances/corrective actions have been investigated and closed out appropriately
Contractor Site Manager	– Implement the requirements outlined in this ESCP – Support the Contractor Project Manager – Ensure all staff including sub-contractors are inducted prior to commencement of works – Ensure adequately skilled staff are undertaking key roles e.g. operation of plant where licence or competency required, clean up of spills – Notify the Project Manager of incidents/non-conformances – Report accurate information to the Contractor Project Manager – Maintain a daily diary – Complete worksite investigations and complete accurate and timely reporting – Carry out all work in a safe and efficient manner and report all hazards, incidents and accidents promptly – Actively support and communicate with your fellow employees on health safety and environment (HSE) related programs, policies and procedures – Conduct and document weekly site inspections – Manage workplace material waste within sphere of control such that damage to the environment is minimised – Report non-conformances to the Project Manager

3.2 Construction timing

The daily works schedule shall take into consideration the expected and predicted rainfall forecast for the region. In particular, works shall aim to avoid periods of predicted significant rainfall. These factors are of the greatest importance when works are programmed to occur within or adjacent to sensitive areas (e.g., drainage lines leading to waterways). Construction activities may be required to be halted during periods of significant rainfall, and appropriate ESC measures may be required to be implemented (refer to Section 3.3) where standard erosion and sediment devices are unable to be constructed (due to available space, temporary inundation, grade or other constraint). In this regard, daily records of weather forecasts shall be obtained, recorded, and kept on-site.

3.3 General sequence of works

Outside of the design of the site-specific ESCP the general works sequence should generally follow the sequence presented in Table 3.2.

Table 3.2 General sequence of works

Work activity	ESC stage
Approvals	Documentation
Site set up (Signage, site delineation)	Installation of boundary ESC
Development construction	ESCP verification, adaptation and maintenance Verify controls have been installed as per ESCP Progressive implementation of soil stabilisation, clean and dirty water drainage, and controls
Final treatment and finishing works	ESC staged to suit cover % Recalculate soil loss and catchment areas if required Install controls as per designed stage plan Consider maintenance and removal of controls while stabilisation occurs
Landscaping monitoring and defects period	ESC removal

3.4 Works on concrete areas

During works on stabilised ground or on concrete the highest risk is for soils, dust or sediments deposited on the surface as part of the infrastructure construction that are then washed away into the stormwater drainage system. Care must be taken to:

– Protect stockpiled material that could be washed away by wind or rain, including existing stormwater inlets in asphalt pavement
– Clean up incidental spills of spoil, cement dust or other material that could be washed into the stormwater system
– Install controls in open drains to capture sediments closest to where they were generated (Refer to standard ESC design drawings in Appendix A)
– Install controls around pits and gullies to prevent sediments entering the stormwater systems (Refer to ESC standard design drawings in Appendix A)
– Maintain these controls in line with Section 4

3.5 Dewatering and managing water ingress

Dewatering shall be minimised wherever possible. Dewatering methods shall use sump pits and discharge filtering and/or settling techniques detailed in Best Practice Erosion and Sediment Control (IECA, 2008)where practicable.

Discharge of water to creeks shall be avoided by directing discharge to a suitable land based containment areas (for infiltration / evaporation). All site water discharges shall be as per method developed within the project team and approved by the client.

3.6 Stockpile management

Where material is to be stockpiled on-site as part of construction. Stockpile sites should:

- Be constructed on relatively level surface at least 2 m from potentially hazardous areas such as concentrated water flows
- Have diversion banks/drains to divert water around the stockpile site
- Have a sediment fence or sediment protection on the downhill side of the site
- Be covered with either geo-fabric, synthetic soil stabilisation, mulch, or vegetation if they are to be in place for more than 7 days. Stockpiles of loose materials (e.g., soil) should be compacted to a hard surface as this should stabilise the material
- Separate stockpiles areas should be provided for differing materials e.g., fill and natural subsoil, and should not be mixed

Refer to standard ESC design drawings in Appendix A.

3.7 Concrete management

Significant volumes of concrete will be poured as a part of the project, which will require management to minimise the impacts that this may have on the environment. An important component of the management of concrete is concrete washout.

When pouring concrete on the site, both the delivery agitator and the concrete pump may require a designated area to clean implements prior to leaving site. To allow for this, a designated concrete washout bay is to be established to ensure that any wastewater from the washout operation is captured and able to be treated/discharged if required. Concrete washout water is high in pH and thus can contaminate both the soil and nearby waterways if uncontrolled.

A concrete washout bay may be established in the form of an earthen bund area lined with an impermeable material such as soil binder or builder's plastic, or by procuring a proprietary skip bin designed specifically to capture concrete washout material. The concrete washout bay must have adequate capacity to capture any washout material (i.e., concrete and water), with a minimum depth/bund height of 300mm recommended if the earthen bund option is used.

Waste concrete should be managed in accordance with the Construction and Demolition Waste Management Plan (CDWMP) (Appendix C of the CEMP). Concrete washout wastewater may either be evaporated or where there are excess quantities these may need to be discharged to an appropriately licensed wastewater treatment facility.

3.8 Where soil disturbance occurs

The following controls will be adopted should soil disturbance exceed that proposed in the EIS for the construction of the LWTP.

3.8.1 Earthworks

Should earthworks be required as part of the construction of the LWTP, the site will experience the highest exposure to the potential transport of soils due to:

– Non-compacted soils
– Uneven surfaces
– Potentially dispersive sub soils
– Changing catchments due to contour changes

Specific practices for the project include:

– Protection of days' work (as the Project requires excavation it is essential that this exposed soil is protected from clean water and that the erosion and sediment controls are implemented progressively):
  - Catch banks or contour drains
  - Extension of clean water drains to protect days' work
  - Addition of erosion and sediment controls (checks and sediment traps)

3.8.2 Finishing work

Final treatments should be implemented as soon as practical, this includes pavements, drain treatments and finishings.

– All finishing works should be executed as per contract requirements
– ESCs should remain in place until:
  - >75% of cover is established (where soil disturbance occurs)
  - All erosive sediments within catchment are removed (material stockpiles, dust build up, etc)
  - Completion of works
– The Contractor Site Manager shall remove all assets not on DGL owned land and make good to pre-existing condition

4. Monitoring and evaluation of performance

4.1 Monitoring and inspections

ESCs should be visually monitored for damage or maintenance requirements daily and rectification should occur as soon as practical. Visual monitoring should be recorded by the Contractor Site Manager, and a weekly inspection which should be documented.

Build-up of sediment within erosion and sediment controls devices shall be removed regularly and following every major rainfall event (>20 mm in 24 hours) to maintain the effectiveness of the ESC devices. All collected sediment should be handled and disposed of appropriately, including classified and disposed off-site to an appropriately licensed facility.

Table 4.1 Inspection Schedule

Inspection	Frequency	Record
Site inspection	Daily	Daily Diary or Daily Inspection Checklist
Site inspection	Weekly	Weekly Inspection Checklist
DGL audit	As requested	Audit Report

4.2 Adverse weather preparedness

The site shall be appropriately prepared for both likely and unlikely adverse weather conditions. The Contractor Project Manager shall consider developing an adverse weather preparedness plan or a shut-down plan to establish appropriate ESC measures and actions. These actions should be implemented prior to a forecast wet weather event (i.e. an 80% or greater chance of >20 mm in a 24-hour period), a forecast high winds event (i.e. an 80% chance or greater chance of >10m/s winds during the following day), or before periods of no work on site such as long weekends or holidays.

The following ESC measures should be considered appropriate for inclusion within the adverse weather preparedness plan:

– Inspect the condition of all ESC devices on site to ensure that these measures are operationally effective on the day prior to the predicted adverse weather event
– Stabilise all drainage pathways and exposed surfaces still subject to construction with temporary ESC devices (i.e., erosion control blankets, hydraulic blankets, or mulching)

5. Reporting

Complaints, environmental incidents and non-compliances with relevant conditions of SSD-8304 should be reported using the Incident Management Procedure outlined in the CEMP.

Where incidents have occurred, the Contractor Project Manager shall ensure that all reasonable and practical control measures are implemented for future operations to reduce the likelihood of the incident. The incident, complaint, non-compliance will be investigated and the learnings from the investigation will applied to the site to reduce the likelihood of reoccurrence.

6. Review and improvement

This ESCP should be reviewed and updated by the Contractor Project Manager on an as required basis or in accordance with the project's CEMP.

7. References

DPE. (2020). Post-Approval Guidance: Environmental Management Plan Guideline – Guideline for Infrastructure Projects.

GHD. (2021). *Additional Contamination Assessment, 201 Five Islands Road, Unanderra, NSW (ref: 12510917-54953, dated 19/3/2021).* GHD Pty Ltd.

IECA. (2008). *Best Practice Erosion and Sediment Control.* Picton: International Erosion Control Association (Australasia).

Landcom. (2004). *Managing Urban Stormwater: Soils and construction - Volume 1, 4th Ed. 'the Blue Book'.* Landcom. Retrieved from https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon

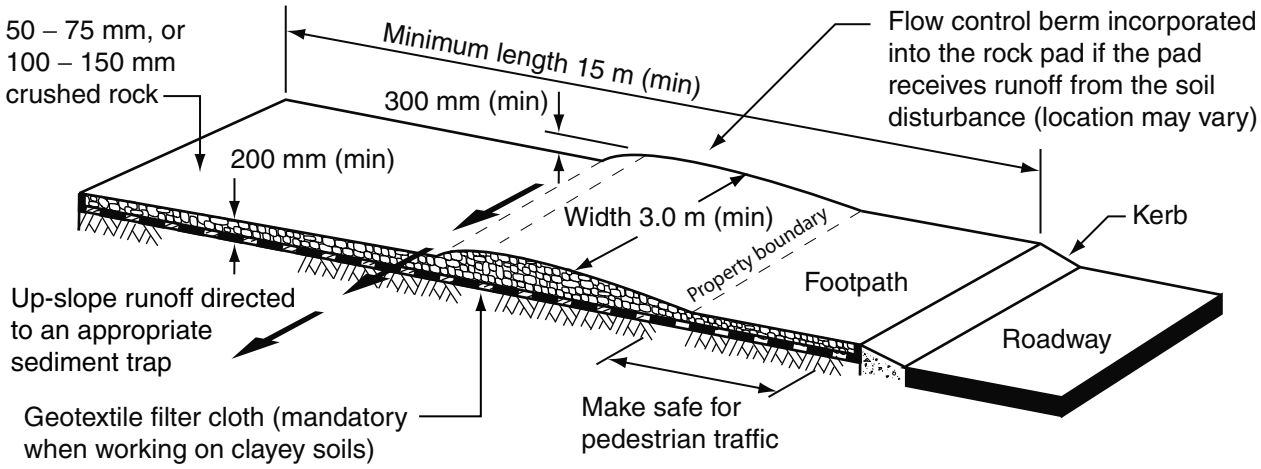
Planning Plus . (2022). *Unanderra Liquid Waste Treatment Facility (SSD 8304) - Request for Additional Information to Agency Submissions - Response to Submissions Report.* Planning Plus.

Planning Plus. (2021a). *Proposed Liquid Waste Treatment Plant Environmental Impact Statement.* Planning Plus.

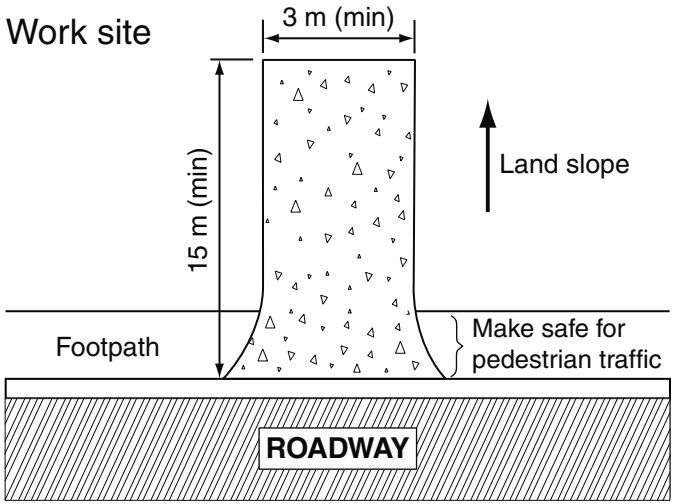
Planning Plus. (2021b). *Proposed Liquid Waste Treatment Plant SSD 8304 Response to Submissions Report.* Planning Plus.

Appendix A

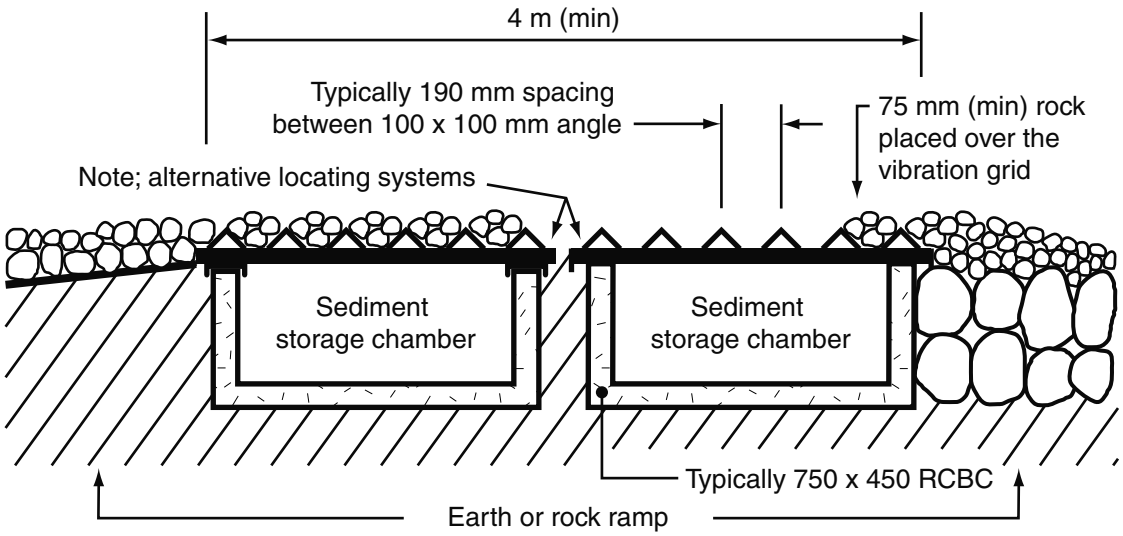
Standard ESC drawings



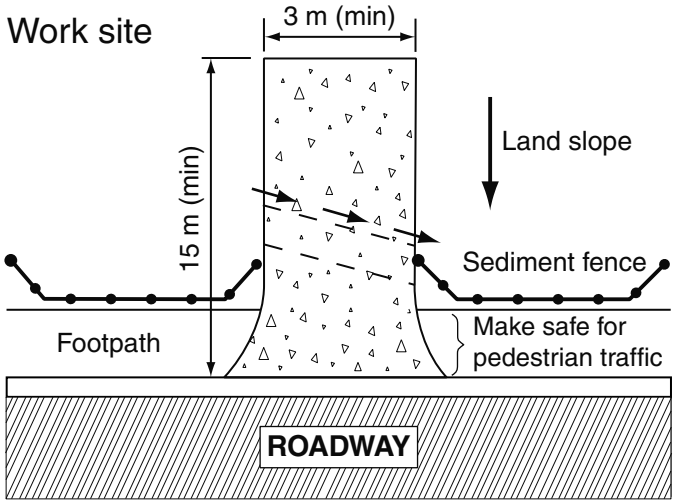
(a) Rock entry/exit pad for construction sites (refer to Standard Drawing Exit-03 for building sites)



(b) Rock pad sloping away from road



(c) Alternative low maintenance arrangement (still under development)



(d) Rock pad sloping towards the road

Drawn:	Date:		
GMW	Apr-10	Construction Exit - Rock Pad (construction sites only)	Exit-01

MATERIALS

ROCK: WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTURBANCES) OR 100 TO 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE: 25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSED INTO SOFT GROUND. CLEAR SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.

3. IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.

4. PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.

5. IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCK PAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARDS THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.

6. THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15m WHERE PRACTICABLE, AND AS WIDE AS THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST 3m. THE ROCK PAD SHOULD COMMENCE AT THE EDGE OF THE OFF-SITE SEALED ROAD OR PAVEMENT.

7. FLARE THE END OF THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.

8. IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THEN COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

1. INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER RUNOFF-PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.

2. IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED OR WASHED ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MATERIAL MUST BE PHYSICALLY REMOVED, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.

3. IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE ROADWAY.

4. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE, A NEW 100mm LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.

5. ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITIONS.

6. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. THE ROCK PAD SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT TRAP.

2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. RE-GRADE AND STABILISE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Drawn:	Date:		
GMW	Apr-10	Construction Exit - Rock Pad (construction sites only)	Exit-02

MATERIALS

SOCKS: MINIMUM 200mm DIAMETER SYNTHETIC OR BIODEGRADABLE TUBES MANUFACTURED FROM NON-WOVEN OR COMPOSITE FABRIC SUITABLE FOR THE 'FILTRATION' OF COARSE SEDIMENTS.

FILL MATERIAL: STRAW, CANE MULCH, COMPOSTED MATERIAL (AS4454), COARSE SAND, OR CLEAN AGGREGATE.

STAKES: MINIMUM 25 x 25mm TIMBER.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THE SOCKS ARE PLACED INDIVIDUALLY OR COLLECTIVELY (AS A SINGLE SEDIMENT TRAP) SUCH THAT:
(i) LEAKAGE AROUND OR UNDER THE SOCKS IS MINIMISED;
(ii) ADJOINING SOCKS ARE TIGHTLY BUTTED OR OVERLAPPED AT LEAST 450mm;
(iii) THE SURFACE AREA OF POTENTIAL WATER PONDING UP-SLOPE OF EACH SEDIMENT TRAP IS MAXIMISED;
(iv) TO THE MAXIMUM DEGREE PRACTICAL, ALL SEDIMENT-LADEN WATER WILL PASS THROUGH THE FORMED POND BEFORE FLOWING OVER THE DOWN-SLOPE END OF THE SEDIMENT TRAP.

3. WHEN PLACED ACROSS THE INVERT OF MINOR DRAINS, ENSURE THE SOCKS ARE PLACED SUCH THAT:
(i) THE CREST OF THE DOWNSTREAM SOCK IS LEVEL WITH THE CHANNEL INVERT AT THE IMMEDIATE UPSTREAM SOCK (IF ANY);
(ii) EACH SOCK EXTENDS UP THE CHANNEL BANKS SUCH THAT THE CREST OF THE SOCK AT ITS LOWEST POINT IS LOWER THAN GROUND LEVEL AT EITHER END OF THE SOCK.

4. IF STAKES ARE REQUIRED TO ANCHOR THE SOCKS, THEIR SPACING DOES NOT EXCEEDING 1.2m OR SIX TIMES THE SOCK DIAMETER (WHICHEVER IS THE LESSER). A MAXIMUM STAKE SPACING OF 0.3m APPLIES WHEN USED TO FORM CHECK DAMS.

MAINTENANCE

1. INSPECT ALL FILTER SOCKS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT WEEKLY INTERVALS.

2. REPAIR OR REPLACE DAMAGED SOCKS.

3. THE BULK OF THE SEDIMENT COLLECTED BEHIND THE FILTER SOCKS SHOULD BE REMOVED BY SHOVEL AFTER EACH STORM EVENT.

4. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

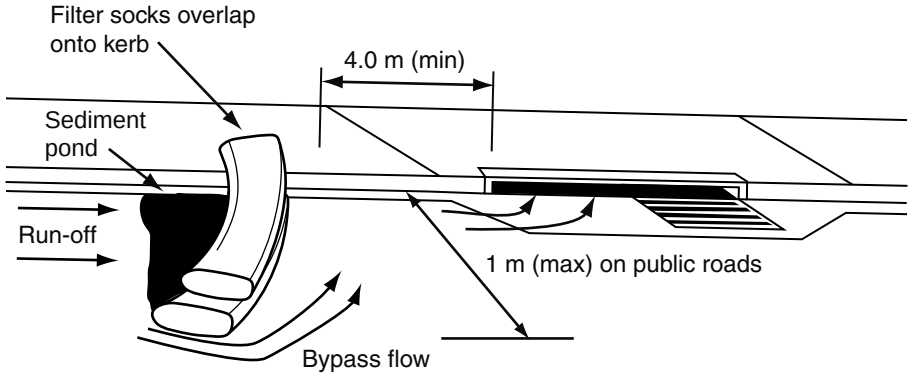
REMOVAL

1. ALL SAND, SOIL, SEDIMENT OR MUD MUST BE PHYSICALLY REMOVED FROM SEALED SURFACES, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.

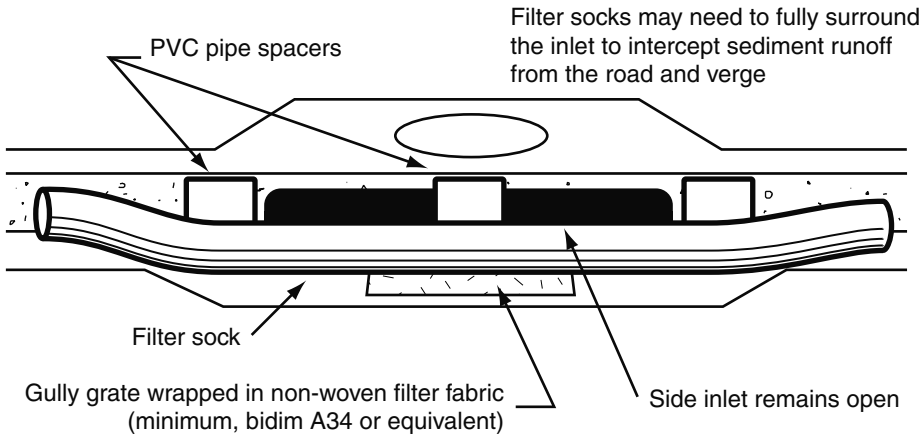
2. IF NECESSARY FOR SAFETY REASONS, THE SEALED SURFACE SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE SURFACE.

3. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

4. ALL SYNTHETIC (PLASTIC) MESH OR OTHER NON READILY BIODEGRADABLE MATERIAL MUST BE REMOVED FROM THE SITE ONCE THE SLOPE OR DRAIN IS STABILISED, OR THE SOCKS HAVE DETERIORATED TO A POINT WHERE THEY ARE NO LONGER PROVIDING THEIR INTENDED DRAINAGE OR SEDIMENT CONTROL FUNCTION.



(a) On-grade kerb inlet sediment trap



(b) Sag inlet sediment trap

Drawn:	Date:		
GMW	Dec-09	Kerb Inlet Sediment Traps	ESC-03

MATERIALS

FABRIC (LIGHT TRAFFIC AREAS): HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH ('BIDIM' A34 OR EQUIVALENT).

FABRIC (HEAVY TRAFFIC AREAS): POLY-PROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN REINFORCED FABRIC. THE FABRIC WIDTH SHOULD BE AT LEAST 700mm, WITH A MINIMUM UNIT WEIGHT OF 140g/m^2. FABRICS SHOULD CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. SELECT THE APPROPRIATE FABRIC FOR THE SITE CONDITIONS.

4. WRAP THE FABRIC AROUND OR OVER THE STORMWATER INLET GRATE IN SUCH A MANNER THAT PREVENTS ANY WATER ENTERING THE STORMWATER INLET WITHOUT PASSING THROUGH THE FABRIC.

5. ENSURE ALL OTHER FLOW ENTRY POINTS ARE COVERED WITH FABRIC SUCH THAT WATER CANNOT ENTER THE STORMWATER INLET WITHOUT PASSING THROUGH A SUITABLE FILTER.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE SAFETY OR FLOODING RISK CAUSED BY OPERATION OF THE SEDIMENT TRAP.

MAINTENANCE

1. INSPECT THE BARRIER AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT AND MAKE REPAIRS AS NEEDED TO THE SEDIMENT TRAP.

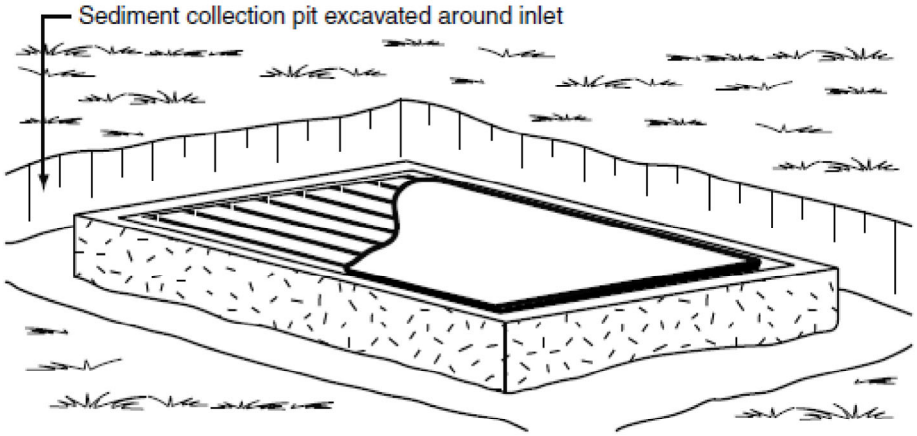
2. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REPLACE THE FABRIC IF IT IS TORN OR DAMAGED.

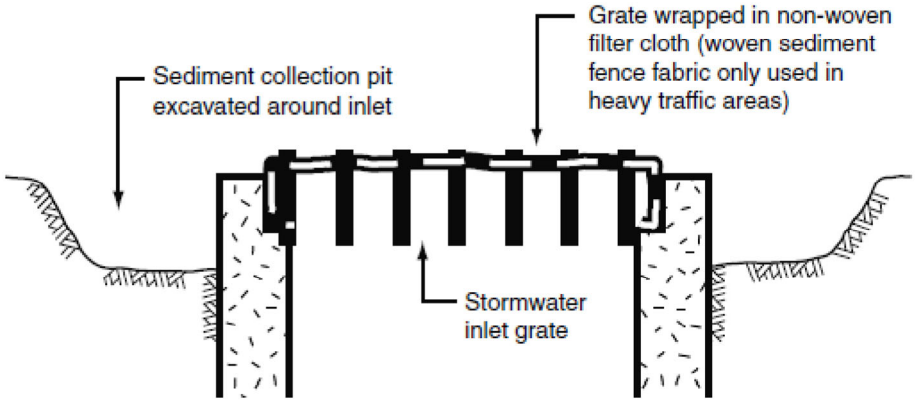
4. SEDIMENT DEPOSITS SHOULD BE REMOVED IMMEDIATELY IF THEY REPRESENT A SAFETY RISK.

REMOVAL

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

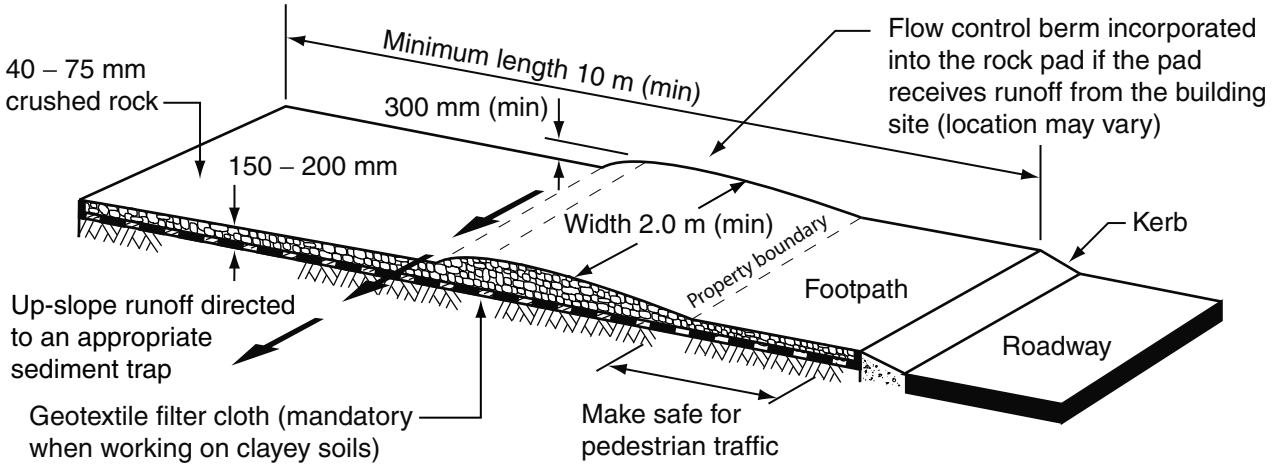


(a) Fabric wrap drop inlet protection with trench

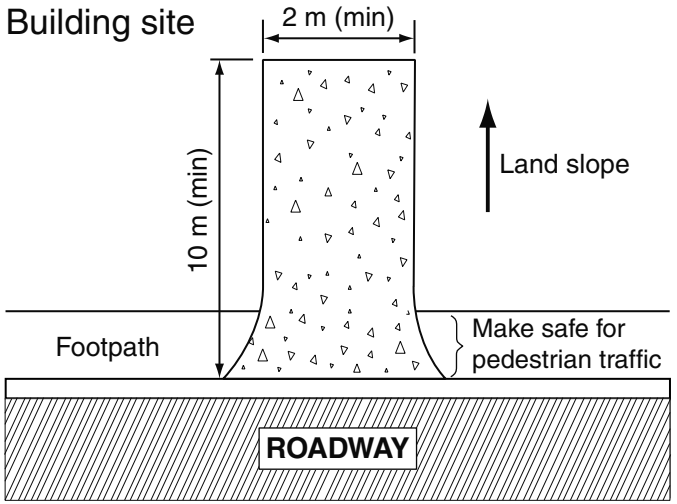


(b) Typical details of excavated sediment collection trench

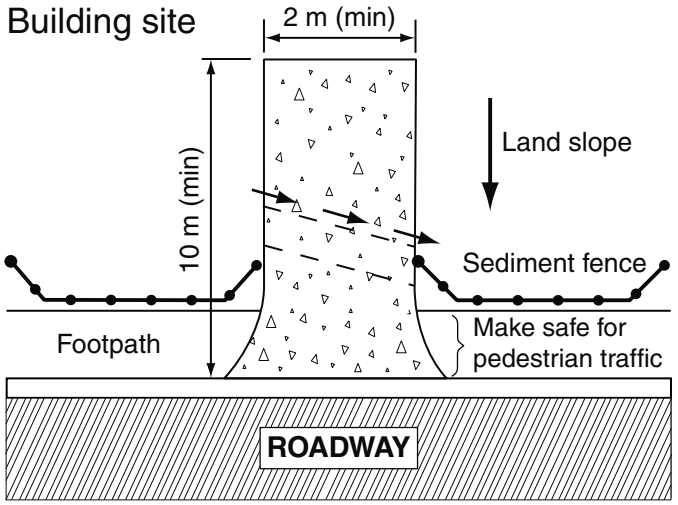
Drawn:	Date:		
GMW	May-10	Grated Stormwater (Field) Inlet Sediment Trap	ESC-02



(a) Rock entry/exit pad for building sites



(b) Rock pad sloping away from road



(c) Rock pad sloping towards the road

CONSTRUCTION NOTES:

MATERIALS

ROCK: WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 40 TO 75mm.

FOOTPATH STABILISING AGGREGATE: 25 TO 50mm GRAVEL OR AGGREGATE (IF REQUIRED).

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

1. INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER RUNOFF-PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.

2. IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED OR WASHED ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MUST BE PHYSICALLY REMOVED, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.

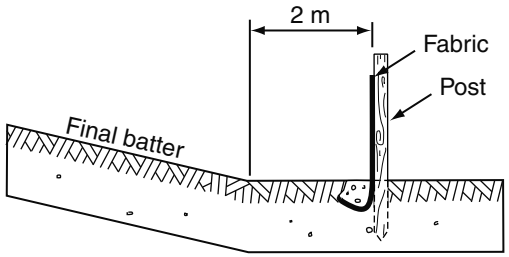
3. IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE ROADWAY.

4. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE, A NEW 100mm LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.

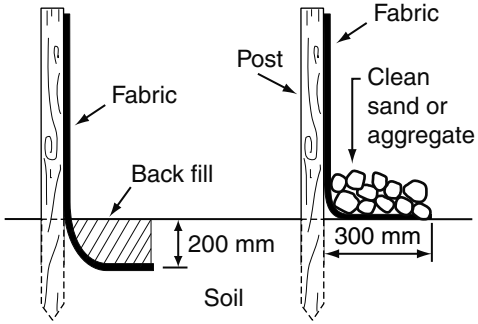
5. ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITION.

6. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

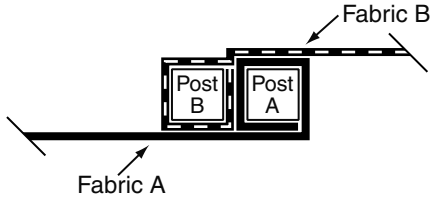
Drawn:	Date:		
GMW	May-10	Rock Pads for Building Sites	Exit-03



(a) Location of fence relative to base of slope

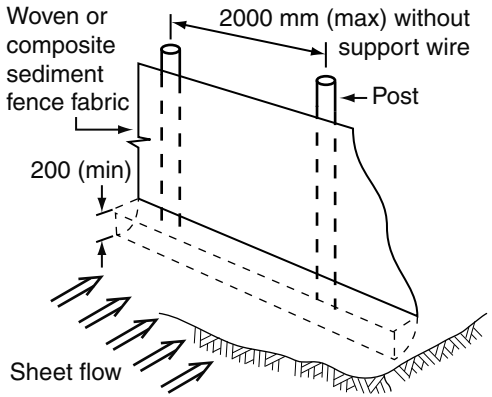


(b) Anchoring base of fabric

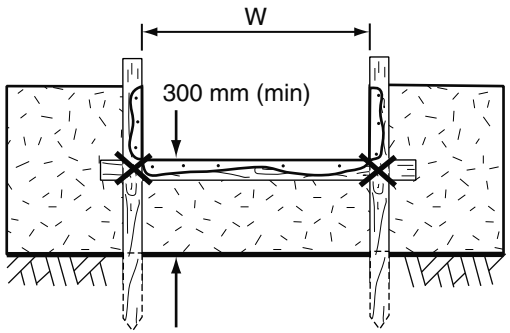


Fabric to fold around each stake one full turn.
Stake B to be drive tightly against Stake A.
The tops of both stakes to be secured with wire.

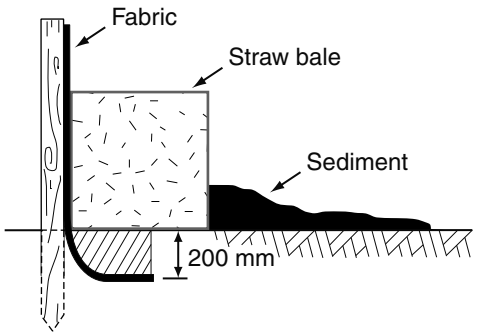
(c) Joining fabric - Method 1



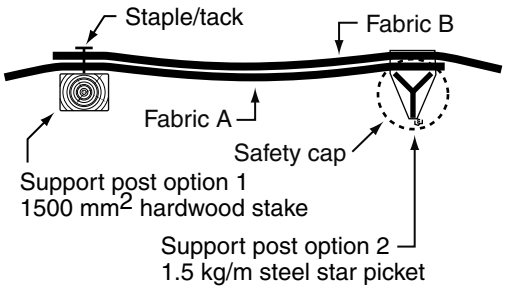
(d) Installation without backing support



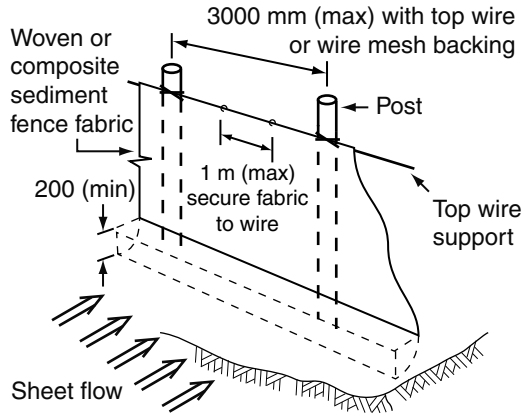
(e) Spill-through weir



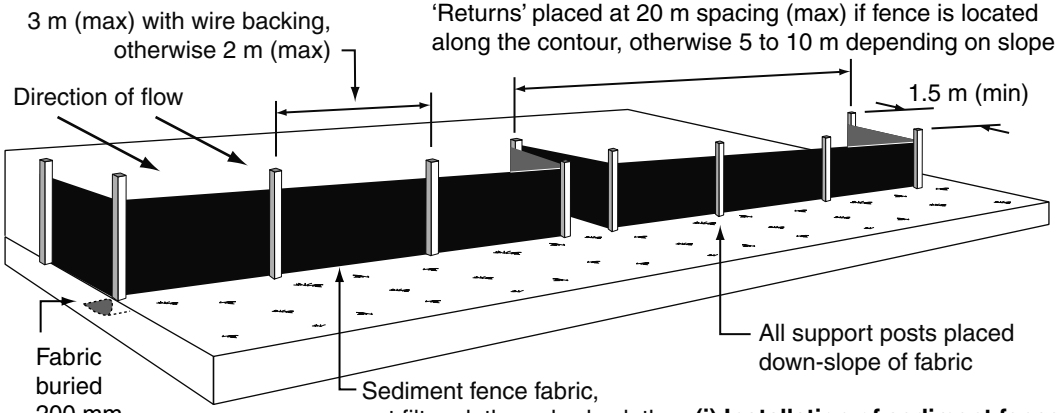
(f) Placement of up-slope straw bale



(g) Joining fabric - Method 2



(h) Installation with top wire support



(i) Installation of sediment fence

Notes:

1. Sediment fence to be installed along a line of constant ground elevation wherever practical.
2. Both end of the sediment fence to extend up the slope at least 1m.
3. Support post to be spaced a maximum 2m unless the fence is supported by a top wire or wire mesh backing, in which case 3m maximum spacing.
4. Fence 'returns' shall be installed at maximum 20m spacing if fence is installed along the contour, otherwise 5 to 10m maximum spacing.
5. Minimum 4 staples or tie wires per stake.

Drawn:	Date:		
GMW	Dec-09	Sediment Fence	SF-01

MATERIALS

FABRIC: POLYPROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700mm IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140GSM. ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT: WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES: 1500mm^2 (MIN) HARDWOOD, 2500mm^2 (MIN) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS SUITABLE FOR ATTACHING FABRIC.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND REQUIRED TYPE OF FABRIC (IF SPECIFIED). IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, FABRIC TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. TO THE MAXIMUM DEGREE PRACTICAL, AND WHERE THE PLANS ALLOW, ENSURE THE FENCE IS LOCATED:
(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;
(ii) ALONG A LINE OF CONSTANT ELEVATION WHEREVER PRACTICAL;
(iii) AT LEAST 2m FROM THE TOE OF ANY FILLING OPERATIONS THAT MAY RESULT IN SHIFTING SOIL/FILL DAMAGING THE FENCE.

3. INSTALL RETURNS WITHIN THE FENCE AT MAXIMUM 20m INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR, OR 5 TO 10m MAXIMUM SPACING (DEPENDING ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR. THE 'RETURNS' SHALL CONSIST OF EITHER:
(i) V-SHAPED SECTION EXTENDING AT LEAST 1.5m UP THE SLOPE; OR
(ii) SANDBAG OR ROCK/AGGREGATE CHECK DAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5m UP THE SLOPE.

4. ENSURE THE EXTREME ENDS OF THE FENCE ARE TURNED UP THE SLOPE AT LEAST 1.5m, OR AS NECESSARY, TO MINIMISE WATER BYPASSING AROUND THE FENCE.

5. ENSURE THE SEDIMENT FENCE IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE FENCE, AND THE UNDESIRABLE DISCHARGE OF WATER AROUND THE ENDS OF THE FENCE.

6. IF THE SEDIMENT FENCE IS TO BE INSTALLED ALONG THE EDGE OF EXISTING TREES, ENSURE CARE IS TAKEN TO PROTECT THE TREES AND THEIR ROOT SYSTEMS DURING INSTALLATION OF THE FENCE. DO NOT ATTACH THE FABRIC TO THE TREES.

7. UNLESS DIRECTED BY THE SITE SUPERVISOR OR THE APPROVED PLANS, EXCAVATE A 200mm WIDE BY 200mm DEEP TRENCH ALONG THE PROPOSED FENCE LINE, PLACING THE EXCAVATED MATERIAL ON THE UP-SLOPE SIDE OF THE TRENCH.

8. ALONG THE LOWER SIDE OF THE TRENCH, APPROPRIATELY SECURE THE STAKES INTO THE GROUND SPACED NO GREATER THAN 3m IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING, OTHERWISE NO GREATER THAN 2m.

9. IF SPECIFIED, SECURELY ATTACH THE SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES WITH THE MESH EXTENDING AT LEAST 200mm INTO THE EXCAVATED TRENCH. ENSURE THE MESH AND FABRIC IS ATTACHED TO THE UP-SLOPE SIDE OF THE STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR SHARP CHANGE OF DIRECTION.

10. WHEREVER POSSIBLE, CONSTRUCT THE SEDIMENT FENCE FROM A CONTINUOUS ROLL OF FABRIC. TO JOIN FABRIC EITHER:
(i) ATTACH EACH END TO TWO OVERLAPPING STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH THE TWO STAKES TIED TOGETHER WITH WIRE; OR
(ii) OVERLAP THE FABRIC TO THE NEXT ADJACENT SUPPORT POST.

11. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS USING 25 X 12.5mm STAPLES, OR TIE WIRE AT MAXIMUM 150mm SPACING.

12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.

13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT LEAST 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THOUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.

14. BACKFILL THE TRENCH AND TAMP THE FILL TO FIRMLY ANCHOR THE BOTTOM OF THE FABRIC AND MESH TO PREVENT WATER FROM FLOWING UNDER THE FENCE.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF A SPILL-THROUGH WEIR

1. LOCATE THE SPILL-THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.

2. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.

3. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/ STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.

4. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

MAINTENANCE

1. INSPECT THE SEDIMENT FENCE AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR ANY TORN SECTIONS WITH A CONTINUOUS PIECE OF FABRIC FROM POST TO POST.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. IF THE FENCE IS SAGGING BETWEEN STAKES, INSTALL ADDITIONAL SUPPORT POSTS.

5. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 1/3 THE HEIGHT OF THE FENCE.

6. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

7. REPLACE THE FABRIC IF THE SERVICE LIFE OF THE EXISTING FABRIC EXCEEDS 6-MONTHS.

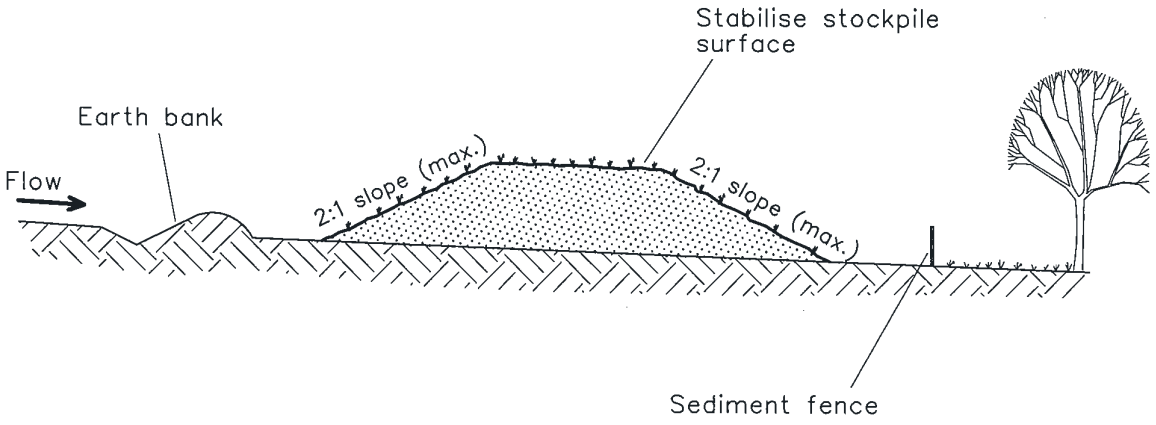
REMOVAL

1. WHEN DISTURBED AREAS UP-SLOPE OF THE SEDIMENT FENCE ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE FENCE MUST BE REMOVED.

2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Drawn:	Date:		
GMW	Apr-10	Sediment Fence	SF-02



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES

SD 4-1

Appendix C

Construction and demolition waste management plan

Unanderra Liquid Waste Treatment Plant

Construction and Demolition Waste Management Plan

DGL Environmental Pty Ltd

21 March 2023

→ The Power of Commitment

Project name		Unanderra Liquid Waste Treatment Facility CEMP					
Document title		Unanderra Liquid Waste Treatment Plant | Construction and Demolition Waste Management Plan					
Project number		12595126					
File name		12595126-REP_Unanderra Liquid Waste Treatment Plant_CDWMP					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	J Liu	A Montgomery	On file.	C Quayle	On file.	21/03/23

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Contents

Table index

Figure index

Abbreviations and definitions

Abbreviation	Definition
BRP	Battery Recycling Plant
CBD	Central Business District
CDWMP	Construction and Demolition Waste Management Plan
CEMP	Construction Environmental Management Plan
DCP	Wollongong City Council Development Control Plan
DGL	DGL Environmental Pty Ltd
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPIs	Environmental Planning Instruments
EPL	Environment Protection Licence
GHD	GHD Pty Ltd
LWTP	Liquid Waste Treatment Plant
PAH	Polycyclic aromatic hydrocarbon
PFAS	Per- and polyfluoroalkyl substances
POEO (General) Regulations	Protection of the Environment Operations (General) Regulations 2009
POEO Act	Protection of the Environment Operations Act 1997
SEPPs	State Environmental Planning Policies
SCC	Specific contaminant concentration
SSD	State Significant Development
SWMMP	Site Waste Minimisation and Management Plan
tpa	tonnes per annum
TCLP	Toxicity characteristics leaching procedure
ULAB	Used Lead Acid Batteries
WARR Act	Waste Avoidance and Resource Recovery Act 2001
Waste Regulation	Protection of the Environment Operations (Waste) Regulations 2014
WTP	Wastewater Treatment Plant

1. Introduction

1.1 Purpose of this report

DGL Environmental Pty Ltd (DGL) commissioned GHD Pty Ltd (GHD) to prepare this Construction and Demolition Waste Management Plan (CDWMP) for the construction of a new Liquid Waste Treatment Plant (LWTP) and demolition of the existing Wastewater Treatment Plant (WTP) at its existing Battery Recycling Plant (BRP) in Unanderra NSW. This project specific CDWMP is a sub-plan to the Construction Environmental Management Plan (CEMP) and describes the environmental strategy, methods, controls and legislative and approval requirements relating to construction and demolition waste management to be implemented during the construction of the LWTP.

The purpose of this CDWMP is to meet the requirements of Conditions B16 and B17 of Development Consent SSD-8304. The key scope includes:

– Identify key waste generating activities and provide detailed information on waste quantities
– Outline construction and demolition waste handling requirements
– Describe construction and demolition waste management measures
– Describe proposed reuse, recycling and disposal locations

This plan shall be read in conjunction with the CEMP and its sub-plans.

1.2 Background

DGL operates a BRP processing Used Lead Acid Batteries (ULAB's) and liquid waste through its existing WTP at No. 201 Five Islands Road, Unanderra, NSW, 4.6 km south-west of Wollongong Central Business District (CBD) (the site).

DGL's current commercial activities comprise ULAB recycling and waste management services focusing on liquid and solid waste treatment, recycling and disposal.

DGL is constructing a new LWTP within Building E at the site. The proposed LWTP will process 56,500 tonnes per annum (tpa) of liquid waste including 8,500 tpa of liquid waste from metal processing and 48,000 tpa of battery acid and wastewater.

An Environmental Impact Statement (EIS) was prepared by Planning Plus in June 2021 to support a State Significant Development (SSD) application to approve the construction of a new LWTP. The SSD application 'SSD-8304' was granted in August 2022.

DGL has requested that GHD develop management plans for the construction of the LWTP to satisfy the conditions of the SSD-8304.

This plan has been prepared considering the requirements of:

– The Post Approval Guidance Environmental Management Plan Guideline (NSW Department of Planning and Environment (DPE) 2020)
– DGL Group Limited Proposed Liquid Waste Treatment Plant EIS (Planning Plus 2021)
– Proposed Liquid Waste Treatment Plant SSD 8304 Response to Submissions Report (Planning Plus 2021a)
– Unanderra Liquid Waste Treatment Facility (SSD- 8304) - Request for Additional Information to Agency Submissions – Response to Submissions Report (Planning Plus 2022)
– SSD-8304

The CDWMP will be endorsed by the Planning Secretary prior to construction commencing.

1.3 Construction activities

Refurbishment of Building E will need to be undertaken to make it fit for the purpose of the LWTP. There will be no major structural changes to the roof or walls of Building E. The refurbishment will include:

– Construction of a new concrete floor on top of the existing concrete floor
– Construction of a new concrete block perimeter bunding
– New sumps and drains
– New concrete ramps
– New electrical services

All process equipment will be located inside bunds that have been designed to contain 110% of the volume of the largest tank. The plant and equipment to be installed is listed in Table 1.1. All floors, bund walls and sumps will be coated with an epoxy resin product to prevent corrosive chemicals from attacking the concrete and leaching into the soil.

The proposed construction methodology described in the EIS indicates sections of the concrete floor in Building E will be demolished and localised excavation works undertaken for the installation of channel drains and foundations for process plant, with a 200 to 300 mm concrete layer laid over the entire floor area for strength and additional capping. However, DGL has advised GHD that the proposed development of the LWTP will not include any subsurface intrusion as the structure will be built upon a raised concrete plinth founded within the concrete footings of the building. The inclusion of the concrete plinth was to satisfy a Council development consent condition which required that the finished floor level (FFL) within Building E be raised to RL 10.34 m Australian Height Datum (AHD), which is approximately 1 m above the current FFL.

Construction hours will be restricted to 7.00am to 6.00pm Monday to Friday, and 8.00am to 1.00pm Saturdays. No construction work will occur on Sundays or public holidays.

Table 1.1 List of plant and equipment to be installed in Building E

Equipment name	Tank capacity (kL)
Neutralisation Reactor 1	75
Neutralisation Reactor 2	75
Neutralisation Reactor 3	75
Holding Tank	75
pH Adjustment Tank 1	75
pH Adjustment Tank 2	75
Polishing Filter Manifold	-
Filtrate Storage Tank	75
Sumps Collection Tank	75
Filter Press	-
Rotary Dryer	-
Dust Extraction System	-
Acid Scrubber	-
Caustic Scrubber	-
Solid Waste Packaging Plant	-
Various pumps and conveyors	-

Source: DGL Group Limited

1.4 Limitations

This report has been prepared by GHD for DGL Environmental Pty Ltd and may only be used and relied on by DGL Environmental Pty Ltd for the purpose agreed between GHD and DGL Environmental Pty Ltd as set out in Section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than DGL Environmental Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by DGL Environmental Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Regulatory framework

2.1 Relevant legislation, strategy and policy

A summary of relevant waste management legislation, strategy and policy is provided below in Table 2.1.

Table 2.1 Relevant legislation and policies

Act / Regulation / Guidelines	Description	Applicability to CDWMP
Environmental Planning and Assessment Act 1979 (EP&A Act) (DPE, 1979)	The *Environmental Planning and Assessment Act 1979* (EP&A Act) and Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) establish the planning and approvals process in NSW. It provides for the making of Environmental Planning Instruments (EPIs) including Local Environmental Plans (LEPs) and State Environmental Planning Policies (SEPPs), which set out requirements for particular localities and/or particular types of development. The applicable EPIs and the EP&A Regulations determine the relevant planning approval pathway and the associated environmental assessment requirements for proposed development activities.	The project (SSD-8304) is approved under Section 4.38 of the EP&A Act, with Minister for Planning as the consent authority, and DGL as the Applicant. The project is to be implemented in accordance with the SSD-8304 conditions. The CDWMP has been prepared to comply with the Development Consent conditions and to address the mitigation measures identified in the EIS.
Protection of the Environment Operations Act 1997 (POEO Act) (NSW EPA, 1997) and the Protection of the Environment Operations (General) Regulations 2009 (POEO (General) Regulations) (NSW EPA, 2009)	The POEO Act sets out the waste classifications, licensing requirements and other regulatory controls that would be applicable to waste transported from the site. The objectives of the POEO Act include the protection, restoration and enhancement of the quality of the environment and reduction of risks to human health. The main provisions of the Act relate to the grant and oversight of environment protection licences, the control of certain actions which may give rise to pollution and the control of waste management activities. The POEO Act governs the requirements for waste generators in terms of storage and lawful disposal of waste. The POEO Act establishes the waste generator as having responsibility for the correct management of waste and provides a range of waste management requirements including processing, handling, moving, storage and disposal of materials. The POEO Act also provides classification of offences as Tier 1, 2 or 3 which have relevance to pollution and waste offences, with prescribed penalty notice amounts provided in the POEO (General) Regulations.	The waste management and handling outlined in this CDWMP has been developed in accordance with the POEO Act and must be implemented throughout the construction period.

Act / Regulation / Guidelines	Description	Applicability to CDWMP
Protection of the Environment Operations (Waste) Regulations 2014 (NSW EPA, 2014) (Waste Regulation)	Sets out obligations that would apply to waste managers, consigners, transporters and receivers dealing with waste coming from the site. The main provisions of the Waste Regulation relate to the payment of a waste levy by licensed waste receivers, the requirements to track the transportation and disposal of certain types of waste, and specific requirements regarding the transportation and management of asbestos waste. Schedule 1 of the Waste Regulation lists types of waste that must be tracked during transport and disposal. Obligations to track these wastes apply to consigners, transporters and receivers. The responsibilities of consigners generally relate to ensuring that transporters and receivers of their waste hold the relevant licences to deal with the waste. Part 7 of the Waste Regulation contains provisions for the transportation and management of asbestos waste, including requirements for its containment during transport, reporting requirements for transporters and receivers of asbestos waste, the manner in which asbestos is disposed, and a prohibition on the reuse or recycling of asbestos waste.	This CDWMP addressed the requirements related to waste management and transportation listed in the Waste Regulation.
Waste Avoidance and Resource Recovery Act 2001 (NSW EPA, 2001) (WARR Act)	The overarching waste management legislation in NSW. The objectives of the WARR Act include encouraging the most efficient use of resources, reducing environmental harm and ensuring resource management decisions are made against a hierarchy that gives preference to waste avoidance and resource recovery. The main provisions of the WARR Act relate to the preparation of waste strategies and extended producer responsibility schemes. The current statutory waste strategy is the 'NSW Waste and Sustainable Materials Strategy' (DPE 2021). Extended producer responsibility schemes may also be made under the WARR Act. Schemes for waste packaging, mobile phones, agricultural chemicals and containers, polyvinyl chloride, oils and lubricants and tyres are identified schemes in place in NSW.	The waste management during the construction of the new LWTP will be implemented in accordance with the WARR Act.
NSW Waste and Sustainable Materials Strategy 2041 (DPE, 2021)	The NSW Department of Planning, Industry and Environment released the NSW Waste and Sustainable Materials Strategy 2041 for Stage 1: 2021 – 2027 in 2021. The strategy aims to facilitate transition to a circular economy over the next six years and sets targets for increased recycling rates. There is a recycling rate target of 70% for commercial and industrial waste by financial year 2022 and 80% by 2030. In addition, an overall landfill diversion rate target of 75% by financial year 2022.	This CDWMP was written with reference to the Strategy, made under the WARR Act.
Wollongong Development Control Plan 2009 (Wollongong City Council , 2009)	The Wollongong City Council (Council) Development Control Plan (DCP) provides detailed controls relating to specific types of development. All controls are designed to aid the decision-making process and improve planning outcomes for the local community. The DCP requires a Site Waste Minimisation and Management Plan (SWMMP) to be completed for all developments within the city. The SWMMP is to be completed in accordance with Council's Demolition and Hazardous Building Materials Management Guide and show storage areas and relevant waste handling methods.	This CDWMP was prepared in accordance with the requirements of the DCP and addresses the requirements of SWMMP.

Act / Regulation / Guidelines	Description	Applicability to CDWMP
NSW Waste Classification Guidelines: Part 1 Classifying Waste (NSW EPA, 2014)and Addendum (NSW EPA, 2016)	Provides classification of wastes into groups that pose similar health risks to the environment and human health. The Guidelines include a stepped process to determine the waste classification which is relevant to the materials that will be transported off the site.	This CDWMP applied the waste classification defined in the guidelines to manage waste and assess potential impacts.

2.2 Compliance with Development Consent SSD-8304

Table 2.2 lists the key requirements of the Development Consent SSD-8304 that relate to the CDWMP and indicates where these requirements are addressed within this or other documents.

Table 2.2 Development Consent SSD-8304 requirements

Condition requirements	Response/reference
Condition B16	
Prior to the commencement of construction of the LWTP, the Applicant must prepare a Construction and Demolition Waste Management Plan to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with condition D2 and must:	This CDWMP
(a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations; and	Section 3.2
(b) be implemented for the duration of construction works.	Section 3.3, 3.4, 3.5, 3.6
Condition B17	
The Applicant must:	
(a) not commence construction until the Construction and Demolition Waste Management Plan is approved by the Planning Secretary.	Section 1.2
(b) implement the most recent version of the Construction and Demolition Waste Management Plan approved by the Planning Secretary.	The most recent version of the CDWMP is provided in the title block on the inside cover of this plan.
Condition D1	
Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
(a) detailed baseline data.	Section 1.2
(b) details of: (i) the relevant statutory requirements (including any relevant approval, licence, or lease conditions). (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures.	 Section 2.1 Section 3.4 Section 3.4
(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria.	Section 3.3
(d) a program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to paragraph above.	 Section 3.4, Section 3.5 Section 3.4
(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.	Refer to CEMP

Condition requirements	Response/reference
(f) a program to investigate and implement ways to improve the environmental performance of the development over time.	Section 3.4
(g) a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria). (ii) complaint. (iii) failure to comply with statutory requirements; and	 Refer to CEMP Refer to CEMP Refer to CEMP
(h) a protocol for periodic review of the plan.	Section 3.6

3. Construction and demolition waste

3.1 Waste planning and hierarchy

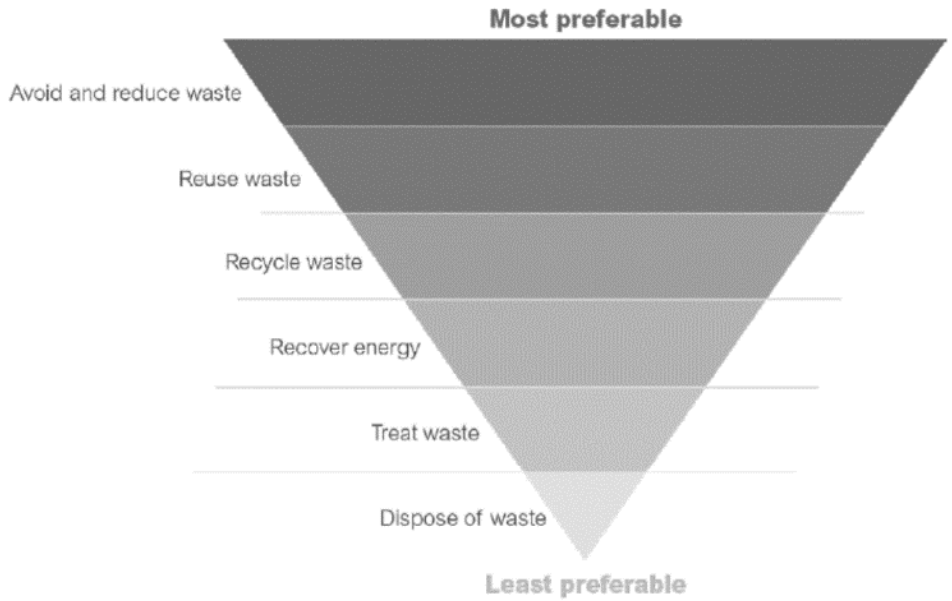
3.1.1 Waste planning

During construction, waste generated on-site would be managed and minimised by waste planning. Waste planning activities would include:

- Careful ordering of construction materials to match the bill of quantities and just-in-time supply to minimise the need for site storage
- Segregating materials and providing weather protection for stored materials on-site, to maximise their fitness for use
- Identification of recycling opportunities for demolition and construction waste
- Encouraging bulk handling and use of reusable and returnable containers and packaging material
- During contractor engagement, advise contractors and sub-contractors and suppliers of the requirements to minimise waste generation and maximise resource recovery on-site
- Updating the CDWMP after consultation with the site contractor, which includes consideration of all the above elements

3.1.2 Waste minimisation and resource recovery

All waste will be managed in accordance with the waste management hierarchy (Figure 3.1). The waste hierarchy prioritises waste avoidance and minimisation and recycling above disposal.



Source: NSW Waste Avoidance and Resource Recovery Strategy 2014–21 (NSW EPA 2014a)

Figure 3.1 Waste management hierarchy

Waste minimisation and resource recovery strategies would be investigated and prioritised as part of the overall construction phase of the project.

3.2 Waste characterisation

This section provides the expected waste types and estimated waste quantities during the construction period based on information provided by DGL.

It is anticipated that only small amounts of construction waste will be generated during the construction period (Planning Plus 2021).

3.2.1 Waste generation activities

The site area is 2 ha and Building E has a footprint of 435 m^2. It is anticipated that construction waste will be generated during construction activities listed in Section 1.3 as well as general waste and recyclables generated from construction personnel:

- Waste concrete and excavated soil during the removal of the existing concrete floor during the building refurbishment
- Waste concrete and construction materials during construction
- Waste packaging during installation of process equipment in Building E shown in Table 1.1
- Waste from construction personnel on-site:
  - It is estimated that construction team on-site will generate a total of approximately 4 kg of general waste (such as food wrappings, gloves, waste food, packaging) and approximately 2.5 kg of recyclables (such as beverage containers) per day during the construction period.
  - These high-level estimates were based on the following assumptions:
    - An average of ten construction personnel will be on-site during construction. This is the maximum of personnel anticipated, the waste volume calculations are therefore deemed conservative for management purposes.
    - Construction personnel will generate on average 0.4 kg of general waste and 0.25 kg of recyclables per day (Mott MacDonald 2014).
    - The construction period could take approximately seven months from site preparation to completion.
    - The construction hours will be restricted to 7.00am to 6.00pm Monday to Friday, and 8.00am to 1.00pm Saturdays. No construction work will occur on Sundays or public holidays.
    - Assumed general waste density of 0.3 t/m^3 (WA 2019).
    - Assumed recyclables density of 0.1 t/m^3 (WA 2019).
  - Based on a 5.5-day week, approximately 73 L of general waste and 138 L of recyclables are expected to be produced each week, which equates to 2.05 m^3 of general waste and 3.85 m^3 of recyclables during the construction period.

3.2.2 Waste classification

All waste generated on-site will be classified. Waste classification will be undertaken in accordance with the Waste Classification Guidelines (EPA 2014). Part 1 of the Waste Classification Guidelines (EPA 2014) identifies six classes of waste:

- Special waste
- Liquid waste
- Hazardous waste
- Restricted solid waste
- General solid waste (putrescible)
- General solid waste (non-putrescible)

The Guideline also describes the six-step process to classifying waste that will be followed. Sampling and analysis of contaminants of potential concern will be carried out and compared to specific contaminant concentration (SCC) criteria in the waste classification guidelines. Toxicity characteristics leaching procedure (TCLP) may be carried out for heavy metals, polycyclic aromatic hydrocarbon (PAH) and/or per- and polyfluoroalkyl substances (PFAS) as required to optimise waste classification.

3.2.3 Waste quantities

The waste will be handled as per Table 3.1. Any unexpected find items that are encountered will be managed in accordance with the Unexpected Finds Protocol (Appendix D of the CEMP).

It is assumed that:

– All contractor buildings will be demountable and be reused at the completion of the project
– Any excess spoil will be reused on-site for site shaping, landscaping and other earthworks subject to the contamination status/waste classification

Table 3.1 Construction waste handling

Waste stream	Waste classification	Estimated volume (m^3)	Bin type	Number of bins	Bin size (m^3)	Collection frequency	Potential destinations
Scrap steel/metal	General solid waste (non-putrescible)	15	Skip bin	1	8 (a 23 m^3 bin can be arranged if needed)	As required	InfraBuild
Clean construction waste including concrete and brick waste	General solid waste (non-putrescible)	17	Skip bin	1	10 or advised by waste contractor	As required	Benedict Recycling Unanderra (or South Coast Equipment Warrawong)
Cardboard and paper	General solid waste (non-putrescible)	10	Compactor bin	1	35 (existing bin on-site)	As required	Bingo industries
Timber / wood (e.g. pallets from packaging)	General solid waste (non-putrescible)	8	Skip bin	1	10 or advised by waste contractor	As required	Benedict Recycling Unanderra
Soil	General solid waste (non-putrescible)	15-20	Skip bin	1	10 or advised by waste contractor	As required	Cleanaway Kemps Creek Resource Recovery Park
Expanded plastic (polystyrene & other lightweight materials from packaging)	General solid waste (non-putrescible)	4	Skip bin	1	2 or advised by waste contractor	As required	Benedict Recycling Unanderra
Commingled recyclable material (e.g. paper, cans, glass and plastic bottles)	General solid waste (non-putrescible)	4 (mainly from construction personnel)	Wheelie bin	2 to 3	240 L	Weekly	Bingo industries
General waste (waste generated by construction staff that is not recyclable e.g. food scraps, polystyrene and non-recyclable plastics) (food waste, other mixed waste)	General solid waste (non-putrescible and putrescible)	15 (including 2 m^3 from construction personnel)	Skip bin	2	23 (existing bin on-site)	As required	Whytes Gully Waste and Resource Recovery Centre

3.3 Waste management

3.3.1 Waste storage

The nominated waste storage area is to be located between Building G and Store C to allow access for collection trucks to pick up the skip bins, as shown below in Figure 3.2 (red shaded area). The storage area will have adequate area to contain the bin storage listed in Table 3.1 and turning space for waste collection vehicles.

During the construction period, the contractor will ensure that the storage area(s) are:

– Easy to use: by ensuring that containers are easily accessible by workers
– Safe: by ensuring that the containers and storage can be managed safely, including limiting public access to the area
– Aesthetic: by ensuring that the site appears orderly and will not raise concern from local residents or businesses, e.g. screening for dust and litter containment and daily collection of windblown material
– Odourless: by ensuring odours are controlled
– Regularly maintained and cleaned: by ensuring waste and recycling containers are to only be washed in an area which drains to a sewer authority approved drainage connection

Waste generated by the construction staff and subcontractors will be stored in receptacles throughout the site office(s) and transferred to the waste storage area for collection.

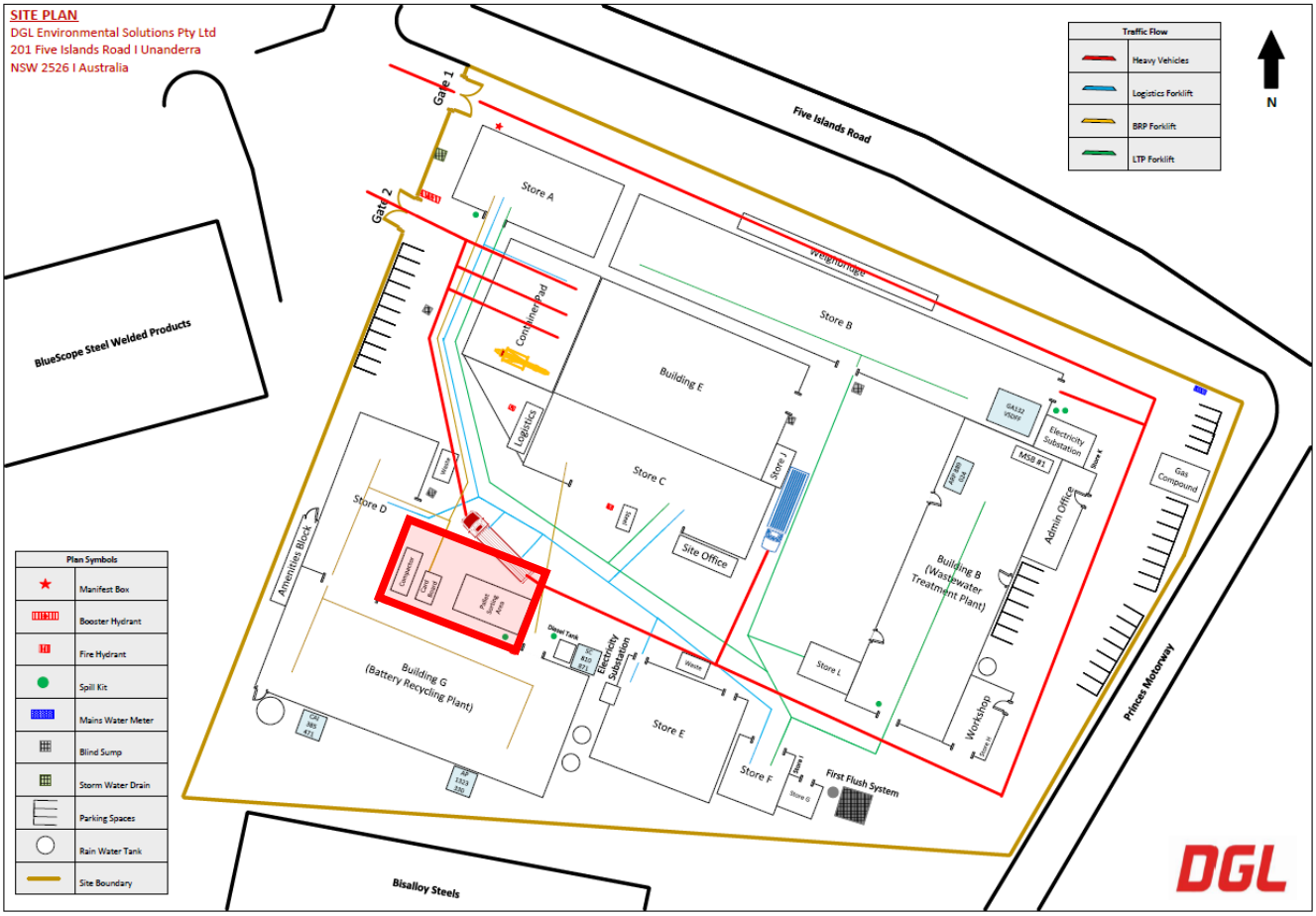


Figure 3.2 Waste storage area

Description of waste storage areas and handling including transport, identification, receipt, stockpiling and quality control will be finalised subject to details to be provided by DGL from the construction contractor.

3.3.2 Waste collection and transport

Construction waste, as outlined in Table 3.1, will be managed by the contractor who will engage appropriately licensed private waste collection contractors to collect and transport the waste off site for disposal or recycling following source segregation on-site.

All transport vehicles will be covered, and tailgates secured prior to trucks leaving the work site. All vehicles will be appropriate for transport of the waste as classified.

Transporters will hold an environment protection licence (EPL) if transporting higher risk wastes ('trackable' waste).

Documents and records of the transport and fate of all materials removed from the site will be kept as proof of correct disposal and for environmental auditing purposes (refer to Section 3.4.2).

3.3.3 Litter management

It is recommended to conduct daily site to identify and collect litter and investigate the cause to reduce the potential for the issue to occur in the future. Litter prevention strategies shall include:

– Ensuring sufficient number of bins and waste receptacles are available to avoid littering outside bins
– Covering all bins to ensure that wastes cannot be blown out during windy conditions. This will also apply to relevant stocks of materials to be used during construction
– Nominating personnel on litter management including regular inspections of sites and surrounds and litter collection

3.3.4 Waste recycling and disposal pathways

Facilities used for the receiving of waste will be appropriately licensed to accept the classified waste type.

3.3.4.1 Recycling

Scrap steel generated during demolition works will be sent for recycling at InfraBuild Recycling Wollongong, Lot 5, No. 243 Berkeley Road, Unanderra NSW 2526.

Commingled recyclables, cardboard and paper generated during construction would be compacted on-site, collected and sent for recycling at Bingo Industries Recycling Centre, Kembla Grange.

Clean construction waste and timber will be sent for recycling at Benedict Recycling Unanderra, No's. 171 to 173 Five Islands Road, Unanderra NSW 2526.

Concrete and brick waste will be sent for recycling at South Coast Equipment, Lot 1 Shellharbour Road, Warrawong NSW 2505.

3.3.4.2 Landfill

General waste will be transported to Whytes Gully Waste and Resource Recovery Centre, which is located approximately 7 km to the south-west of the site. The centre is licensed (EPL 5862[1]) (NSW EPA, 2000) to accept any capacity of the following waste by application to land:

– General solid waste (putrescible)
– General solid waste (non-putrescible)
– Asbestos waste
– Waste tyres (maximum five whole tyres being received and disposed at any one time)

Although Whytes Gully is licenced to accept general solid waste (non-putrescible) and asbestos waste, Council's website does not advertise that these waste types can be disposed that the facility.

Premises location: Reddalls Road, Kembla Grange NSW 2526

[1] Version dated 7 November 2022

Hazardous materials, asbestos waste and soil will be delivered to Cleanaway Kemps Creek Resource Recovery Park, which is located approximately 97 km to the north of the site. This site is licensed (EPL 4068[2]) (NSW EPA, 2001)to accept any capacity of the following waste by application to land:

– General solid waste (putrescible)
– General solid waste (non-putrescible)
– Asbestos waste
– Waste tyres (maximum five whole tyres being received and disposed at any one time)
– Restricted solid waste
– Restricted solid waste (which is also subject to general or specific immobilisation approvals which have a restriction that they may only be disposed of at waste disposal facilities which have currently operating leachate collection systems)

Premises location: 1725 Elizabeth Drive, Kemps Creek NSW 2178.

3.3.5 Waste tracking

Consistent with the Protection of the Environment Operations (Waste) Regulation 2014 (NSW EPA) the following wastes potentially encountered/generated are required to be tracked within NSW:

– Liquid Waste (Category 1 trackable waste)
– More than 100 kg of asbestos waste or more than 10 m^2 of asbestos sheeting in any single load
– Waste oil/water, hydrocarbon/water mixtures emulsions
– Wastes listed in Table 1 of the NSW EPA 'Waste that must be tracked' Guideline (NSW EPA 2018)
– Hazardous Wastes as defined by Table 3 in the NSW EPA 'Waste that must be tracked' Guideline (NSW EPA 2018)

Details of waste types, volumes and destinations will be recorded in the waste management register (refer Section 3.4.2) for all waste movements off-site. While asbestos waste and tyres are not expected to be generated, if they are, the NSW EPA Waste Locate system will be used. The online waste tracking system developed by EPA will be used to track all other trackable waste, if required.

3.4 Records and reporting

3.4.1 Reporting

Reporting requirements and responsibilities are documented in the CEMP Section 4.1.

3.4.2 Waste records

A waste management register will be maintained which identifies all waste generated on-site and subsequent management. The register will document the following:

– The type and quantity of waste (including its classification)
– Whether the waste is to be reused, recycled (on or off-site) or sent for disposal
– Tracking information (where applicable)
– Upon removal from site: date of removal, transport contractor information and final destination

All relevant documentation such as dockets, receipts and waste classification records will be retained with the waste management register.

[2] Version dated 7 November 2022

3.4.3 Record control

Waste and recycling records will be identified, collected and stored in accordance with the CEMP Section 4.5.

3.5 On-site management and responsibilities

3.5.1 Signage

Waste and recycling storage areas would include signage that clearly describes the types of materials that can be deposited into recycling bins and general garbage bins.

3.5.2 On-site management

On-site management and controls would include:

- Implementation of the CDWMP by the contractor
- Segregating wastes generated on-site, using different bins for recycling (individual bins for each recycling stream) and general waste
- Discussion about the site's waste management and recycling policies and practices with employees and subcontractors during site inductions and toolbox talks as discussed in Section 4 of the CEMP
- Discussion with waste collection contractors to seek optimal waste recovery measures
- Ensuring all waste disposal bins are clearly marked with appropriate signage and instructions
- Keeping records of quantities of waste and recycled materials disposed of, and the destinations of these materials as discussed in Section 3.3.5
- Ensuring that wastes are only disposed to licensed facilities

3.5.3 Roles and responsibilities

While all personnel working on the LWTP are responsible for waste separation and correct disposal, the Contractor Project Manager has the overall responsibility for on-site waste management. The responsibilities of key roles involved in the Project are outlined in Table 3.2.

Table 3.2 Roles and responsibilities

Roles	Responsibilities
DGL Project Manager	– Ensure the instruction of DGL staff and contractor(s), implementation and overseeing of the CDWMP during induction processes
Contractor Project Manager	– Engage qualified waste service contractors(s) according to the DGL requirements – Ensure the instruction of contractor staff, subcontractor(s) and visitors, implementation and overseeing of the CDWMP during induction processes
Contractor Site Manager	– Operation and general maintenance of waste equipment (bins) and storage areas – Keep records of quantities of waste and recycled materials disposed of, and the destinations of these materials as discussed in Section 3.3.4 – Provide training and induction to all its personnel including subcontractors or delegate the responsibility to a qualified staff, e.g. HSE Advisor
Contractor HSE Advisor	– Ensure waste are collected and transferred to the central collection points on a regular basis – Litter management
All Contractor Staff and Subcontractors	– Waste separation and correct disposal – Ensure rubbish is not littered outside bins or left unattended
Waste service contractor(s)	– The collection of waste from the collection point(s) – Transport of the waste streams off site for licensed disposal or further processing/recycling – Waste monitoring, reporting and audits (if required)

3.6 Review and improvement

This CDWMP should be reviewed and updated by DGL as per Condition D4(b) on an as required basis or in accordance with the project's CEMP.

Any revisions to the CDWMP will be undertaken in accordance with the process outlined in Section 6 of the CEMP. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with Section 4 of the CEMP.

4. References

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Appendix D

Unexpected finds protocol

Unanderra Liquid Waste Treatment Facility

Unexpected Finds Protocol

DGL Environmental Pty Ltd

21 March 2023

→ **The Power of Commitment**

Project name		Unanderra Liquid Waste Treatment Facility CEMP					
Document title		Unanderra Liquid Waste Treatment Facility | Unexpected Finds Protocol					
Project number		12595126					
File name		12595126_Unanderra Liquid Waste Treatment Facility_UFP.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	E. Boardman	C. Quayle	On file.	C. Quayle	On file.	21/03/23

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Contents

Table index

Figure index

Appendices

Abbreviations and definitions

Abbreviation	Definition
ACM	Asbestos contaminated material
AASS	Actual acid sulfate soil
AHD	Australian Height Datum
AECs	Areas of environmental concern
ASS	Acid sulfate soil
BRP	Battery Recycling Plant
BTEXN	Benzene, toluene, ethylbenzene, xylene and naphthalene
CBD	Central Business District
CEMP	Construction Environmental Management Plan
COPCs	Contaminants of potential concern
DGL	DGL Environmental Pty Ltd
EIS	Environmental Impact Statement
FFL	Finish floor level
LWTP	Liquid Waste Treatment Plant
OCP	Organochlorine pesticides
OPP	Organophosphorus pesticides
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential acid sulfate soil
PCB	Polychlorinated biphenyls
PID	Photoionisation detector
ppm	Parts per million
RIS	Reduced Inorganic Sulfur
SPR	Source-Pathway-Receptor
SSD	State Significant Development
SVOC	Semi-volatile organic compound
tpa	Tonnes per annum
TRH	Total recoverable hydrocarbons
UFP	Unexpected Finds Protocol
ULAB	Used Lead Acid Batteries
UXF	Unexpected Find
VOC	Volatile organic compounds
WTP	Wastewater treatment plant

1. Introduction

1.1 General

DGL Environmental Pty Ltd (DGL) operate a Battery Recycling Plant (BRP) processing Used Lead Acid Batteries (ULAB's) and a Wastewater Treatment Plant (WTP) at No. 201 Five Islands Road, Unanderra, NSW (the site; refer to blue outline in Figure 2.1). The site is located 4.6 km south-west of Wollongong Central Business District (CBD).

DGL's current commercial activities comprise ULAB recycling and waste management services focusing on liquid and solid waste treatment, recycling and disposal.

DGL is constructing a new Liquid Waste Treatment Plant (LWTP) within Building E on the site (refer to Figure 2.1). The proposed LWTP will process 56,500 tonnes per annum (tpa) of liquid waste including 8,500 tpa of liquid waste from metal processing and 48,000 tpa of battery acid and wastewater.

An Environmental Impact Statement (EIS) was prepared by Planning Plus in June 2021 (Planning Plus, 2021) to support a State Significant Development (SSD) application to approve the construction of a new LWTP. The SSD application 'SSD-8304' was granted in August 2022.

1.2 Purpose of this report

GHD has been engaged by DGL to prepare this Unexpected Finds Protocol (UFP) as a sub-plan to the Construction Environmental Management Plan (CEMP) to outline the environmental management and mitigation measures to be implemented for the unexpected finds of contamination associated with the construction of the LWTP.

1.3 Limitations

This report: has been prepared by GHD for DGL Environmental Pty Ltd and may only be used and relied on by DGL Environmental Pty Ltd for the purpose agreed between GHD and DGL Environmental Pty Ltd as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than DGL Environmental Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by DGL Environmental Pty Ltd and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Site setting

2.1 Defining the site

The site consists of multiple buildings including a BRP (Building G) and a WTP, the location of the proposed LWTP is within Building E, as shown in Figure 2.1.

Figure 2.1 Site Layout Plan - image sourced from Wollongong Council's Intramap (Wollongong City Council, 2022)

2.2 Proposed development

Refurbishment of Building E will need to be undertaken to make it fit for the purpose of the LWTP. There will be no major structural changes to the roof or walls of Building E. The refurbishment will include:

– Construction of a new concrete floor on top of the existing concrete floor
– Construction of a new concrete block perimeter bunding
– New sumps and drains
– New concrete ramps
– New electrical services

All process equipment will be located inside bunds that have been designed to contain 110% of the volume of the largest tank. All floors, bund walls and sumps will be coated with an epoxy resin product to prevent corrosive chemicals from attacking the concrete and leaching into the soil.

The proposed construction methodology described in the EIS indicates sections of the concrete floor in Building E will be demolished and localised excavation works undertaken for the installation of channel drains and foundations for process plant, with a 200 to 300 mm concrete layer laid over the entire floor area for strength and additional capping. However, DGL has advised GHD that the proposed development of the LWTP will not include any subsurface intrusion as the structure will be built upon a raised concrete plinth founded within the concrete footings of the building. The inclusion of the concrete plinth was to satisfy a Council development consent condition which required that the finish floor level (FFL) within Building E is to be raised to RL 10.34 m Australian Height Datum (AHD), which is approximately 1 m above the current FFL.

2.3 Site history

Available site history information indicates the site and surrounding land are likely to have been used for agricultural land between 1899 and 1961/64. No information is available on the site prior to 1899. Between 1921 and 1961/64 the site was owned by commercial entities but both aerial photos and council records suggest that site structures were only constructed after 1964. Between 1961/64 and the present the site was utilised for the processing of metal and metal production by-products with recycling of lead acid batteries taking place on-site since 1992. The site stores a variety of chemicals including acids, alkalis, and diesel fuel (GHD, 2021).

2.4 Acid sulfate soil occurrence

The Acid Sulfate Soil (ASS) Risk Map (DLWC, 1997) shows that the site is situated in an area mapped as disturbed terrain at elevations >4 m Australian Height Datum (AHD).

2.5 Subsurface conditions

A summary of the subsurface conditions encountered during previous site investigations, and the corresponding depth ranges is provided in Table 2.1 below. No evidence of contamination such as odours, staining or ACM were observed during field investigations. Ionisable volatile organic compounds (VOCs) were measured using a photoionisation detector (PID). This PID recorded concentrations of ionisable VOCs less than 3.4 ppm.

Table 2.1 Summary of subsurface conditions

Unit	Description	Depth range (m bgl)*
Floor slab	Concrete	0.37 to 0.45
Fill	Coalwash: sandy gravel, coarse grained, dark grey, coarse grained sands, dry	0.8 to 1.0
Alluvium	Sand, find to medium grained, yellow, moist to wet	1.7 to 2.2
Residual	Clay, medium plasticity, grey, wet	To depths greater than 4 m bgl

Notes: * m below ground level

2.6 Contamination status

Previous investigations have been carried out the site by GHD and ENRS between 2018 and 2021. The investigations identified five areas of environmental concern (AECs), which had several associated contaminants of potential concern (COPCs). The identified AECs and COPCs are summarised in Table 2.2 below.

Table 2.2 Potential contaminant sources and COPC

AEC	Potential contaminant source	On-site or off-site source?	Contaminant of potential concern
1	Potential historical weathering of asbestos building materials	On-site	Asbestos
2	Processing of metal and metal production by-products (i.e. furnace ash and waste metal) both on-site and in neighbouring properties (i.e. potential off-site sources of contamination)	On-site / off-site	TRH, BTEX, PAH, SVOC, VOC, acids, alkalis
3	Processing of lead acid batteries	On-site	Metals, acids, alkalis
4	Fill of unknown quality, quantity and origin and asbestos contaminated stockpile of fill material (subsequently removed from site (refer to ENSR report (2019a, p. 25))	On-site	TRH, BTEX, PAH, OCP, OPP, PCB, metals, asbestos.
5	Lead hotspot (BH20)	On-site	Lead (and potentially other heavy metals)

*Table notes

TRH	Total recoverable hydrocarbons	BTEXN	Benzene, toluene, ethylbenzene, xylene and naphthalene
PAH	Polycyclic aromatic hydrocarbons	OCP	Organochlorine pesticides
OPP	Organophosphorus pesticides	PCB	Polychlorinated biphenyls
VOC	Volatile organic compound	SVOC	Semi-volatile organic compound
Metals	Antimony, arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, zinc		

Twenty-eight (28) investigation locations from which 70 samples were analysed for identified COPCs, were used to assess the five AECs identified at the site (GHD, 2021). Asbestos and concentrations of lead that exceeded assessment criteria by more than 250% were considered to pose an unacceptable risk to human health. Remaining COPCs reported concentrations below adopted assessment criteria and are therefore not considered to pose an unacceptable risk to human health or the environment.

Based on field and laboratory results, the Source-Pathway-Receptor (SPR) linkages were reassessed. SPR linkages were potentially complete for lead and asbestos within the area immediately south of Building G (BRP), and for workers involved in cleaning out stormwater pits containing sediment significantly contaminated with lead.

Asbestos has been identified historically in other areas of the site but has since been removed. Therefore, it cannot be precluded that asbestos is not present in other parts of the site that have not been directly sampled as part of this investigation. Because the majority of the site is paved, the exposure risk to asbestos is assessed unlikely, unless pavements are removed, or excavation occurs.

No exceeding concentrations of COPCs were reported in samples assess soils beneath or adjacent to Building E.

Concentrations of various metals in groundwater beneath the site were greater than the adopted ecological assessment criteria (ANZG, 2018), and hence groundwater has the potential to pose risks to ecological receptors if it discharges with similar concentrations to aquatic receptors. Human and groundwater users were not identified as primary receptors.

3. Unexpected finds protocol

3.1 General

At this stage, the construction of the LWTP is unlikely to involve penetration of the subsurface therefore site soil and groundwater will not be disturbed during construction. Previous investigations did not identify contamination in soil below or adjacent to Building E, in particular, volatile organic compounds (VOC).

Therefore, based on results of previous investigations and no ground penetration associated with construction, the likelihood of encountering an unexpected find during construction is very low. Should excavation of the subsurface be required, the likelihood of encountering an unexpected find during construction is assessed as low.

Non-excavation scenario

Asbestos has been used as a building material throughout the site and therefore could be present within Building E. The hazardous building material register should be checked prior to the commencement of construction activities. Possible unexpected finds that could be encountered at the surface may include:

– Cement bound asbestos containing material (ACM) in building waste or conduits
– Asbestos sheeting and ACM fragments
– Friable asbestos, commonly associated with lagging around pipes and wall insulation
– Unusual odours or petroleum hydrocarbon odours

Excavation scenario

The depth of excavation, if required, has not been confirmed. Should excavation be required as part of the proposed development, the following unexpected finds could be encountered in the subsurface:

– Ground conditions that differ significantly to what has been encountered during previous investigations (refer to Table 2.1)
– ACM fragments
– Staining, discolouration or unusual colouration of soils (e.g. blue, green, etc.)
– Unusual odours or petroleum hydrocarbon odours
– Acid sulfate soils (refer to Appendix A). If excavation extends into the alluvial soil, an ASS assessment of excavated soil may be required to inform appropriate management measures.

In the event that unexpected finds or situations are identified, Figure 3.1 below sets out the procedure to be followed.

3.2 Unexpected finds procedure

An Unexpected Finds Procedure (UFP) has been developed and is illustrated below in Figure 3.1, which outlines the suggested procedures that should be followed in the event of an unexpected find.

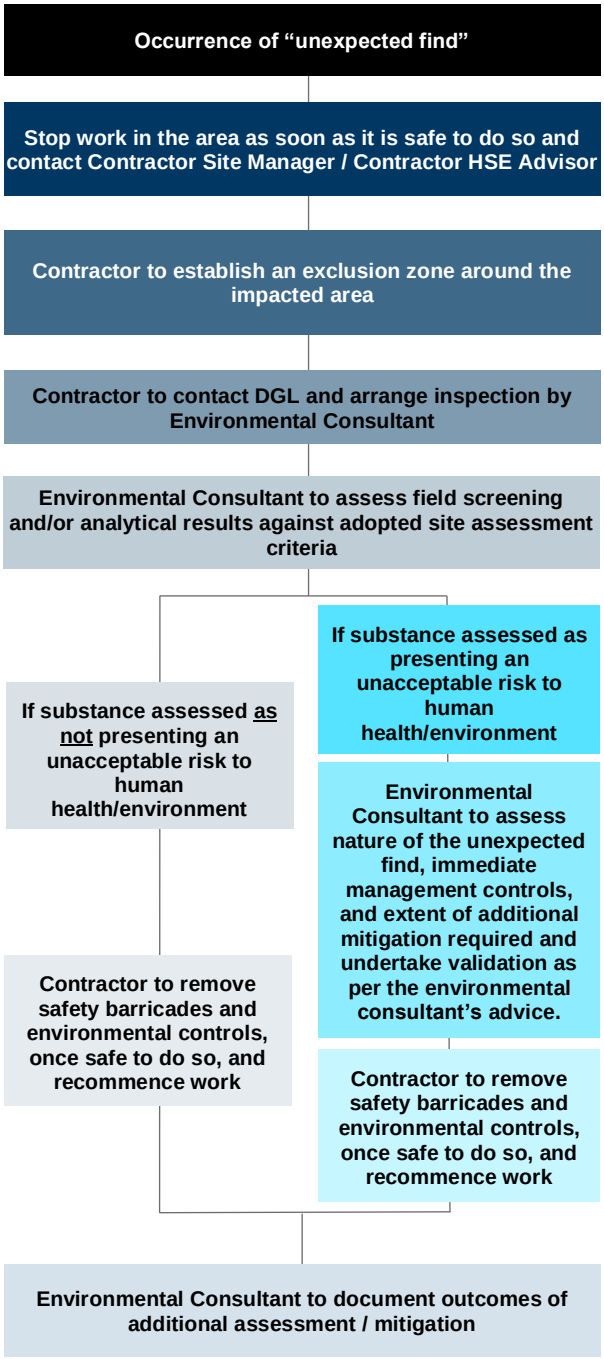

Figure 3.1 Unexpected finds procedure

3.3 Contact details

Contact details applicable to this UFP are listed in Table 3.1.

Table 3.1 Contact details

Position	Name	Phone Number
Project Manager	To be confirmed	To be confirmed
Environmental Consultant	To be confirmed	To be confirmed

4. References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra ACT, Australia: and New Zealand Governments and Australian state and territory governments. Retrieved from www.waterquality.gov.au/anz-guidelines

DLWC. (1997). *Acid Sulfate Soil Risk Map - Wollongong 1:25,000, 2nd Ed.* Department of Land and Water Conservation.

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Appendices

Appendix A

Visual indicators of Acid Sulfate Soil

Visual classification of ASS

– Sullivan et al (2018) states that ‘ASS materials are distinguished from other soil or sediment materials (referred to as ‘soil materials’ throughout this guideline) by having properties and behaviour that have either:
  1. Been affected considerably by the oxidation of Reduced Inorganic Sulfur (RIS), or
  2. The capacity to be affected considerably by the oxidation of their RIS constituents (Figure A.1).
– The factor common to all ASS materials is that RIS components have either had, or may have, a major influence on the properties or behaviour of these soil materials. These soils are typically found in low-lying coastal areas and saline inland areas; however, they have been identified in a wide range of environmental settings.’

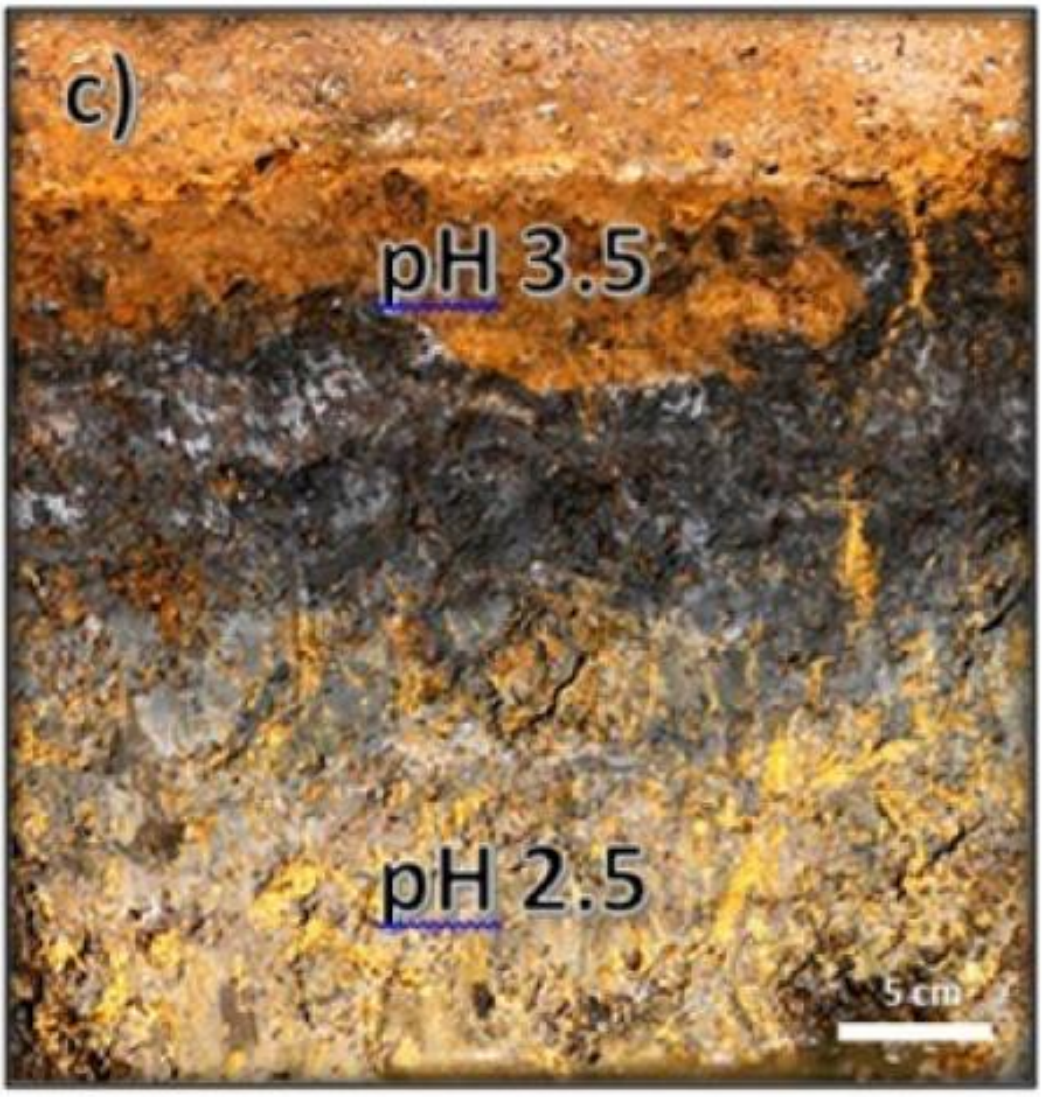


Figure A.1 ***Actual ASS profile showing surficial iron oxide and yellow jarosite segregations (Source: Figure 1.1, slide c, pg. 2 of National acid sulfate soils sampling and identification methods manual)***

– A list of potential field indicators of potential ASS and actual ASS is provided in Table 5.1 of the National Acid Sulfate Soils Guidance: National acid sulfate soils sampling and identification methods manual (Sullivan, Ward, Toppler, & Lancaster, 2018a). This table has been reproduced below as Table A.1 and Table A.2 to assist in identification of potential or actual ASS on-site.

Table A.1 Indicators of potential ASS materials

Soil type	Indicators
Potential acid sulfate soil (PASS)	Soil characteristics • soil $pH_F > 4$ and commonly neutral • soil $pH_{FOX} < 3$, with large unit change from pH_F to pH_{FOX}, together with volcanic reaction to peroxide# • waterlogged soils—unripe muds (soft, sticky and can be squeezed between fingers, blue grey or dark greenish grey mud with a high water content, for example Figure 1.1b), silty sands or sands (mid to dark grey) or bottom sediments (dark grey to black for example monosulfidic black oozes) possibly exposed at sides and bottom of drains, cuttings or in boreholes • peat or peaty soils • coffee rock horizons, and • a sulfurous smell for example hydrogen sulfide or 'rotten egg' gas. Water characteristics • waterlogged soils, and • water pH usually neutral but may be acidic • oily looking iron bacterial surface scum (the similar appearances of iron bacterial scum and a hydrocarbon slick can be differentiated by disturbing the surface with a stick—bacterial scum will separate if agitated whereas a hydrocarbon slick will adhere to the stick upon removal). Caution should be taken when inspecting highly-altered landscapes in the field (for example where inert fill has been placed over ASS material, dredge spoil, et cetera.). Soil, water and landscape indicators may be masked by past landscape and drainage modifications and this should be taken into consideration when determining borehole locations. Vegetation characteristics • dominant vegetation is tolerant of salt, acid and/or waterlogging conditions for example samphires, salt couch, Phragmites (a tall acid-tolerant grass species), swamp-tolerant reeds, rushes, paperbarks (*Melaleuca* spp.) and casuarinas (*Casuarina* spp.).

Further guidance on the interpretation of field testing results for ASS materials is provided in Appendix A.

* May also be due to excessive salinity or to salinity in combination with AASS.

Source: modified from DER (2015a).

Table A.2 Indicators of Actual ASS materials

Soil type	Indicators
Actual acid sulfate soil (AASS)	Soil characteristics • soil pH_F < 4 (when soil pH_F > 4 but < 5 this may indicate some existing acidity and other indicators should be used to confirm presence or absence of AASS) • sulfurous smell for example hydrogen sulfide or 'rotten egg' gas • any jarositic horizons (for example Figure 1.1c) or substantial iron oxide mottling in the surface encrustations or in any material dredged or excavated and left exposed, and • presence of corroded mollusc shells. Water characteristics • water of pH < 5.5 (and particularly below 4.5) in surface water bodies, drains or groundwater (this is not a definitive indicator as organic acids may contribute to low pH in some environments such as Melaleuca swamps) • unusually clear or milky blue-green water flowing from or within the area (aluminium released by ASS materials acts as a flocculating agent) • extensive iron stains on any drain or pond surfaces (for example Figure 1.1d), or iron-stained water and ochre deposits, and • oily looking bacterial surface scum (differentiated from a hydrocarbon slick of similar appearance as described for PASS). Vegetation characteristics • dead, dying, stunted vegetation* • scalded or bare low-lying areas*, and • poor vegetation regrowth in previously disturbed areas. Infrastructure • corrosion of concrete and/or steel structures* (including foundations, fences, masonry/brick walls, pipes).

Further guidance on the interpretation of field testing results for ASS materials is provided in Appendix A.

* May also be due to excessive salinity or to salinity in combination with AASS.

Source: modified from DER (2015a).

Appendix E

DGL Environmental Management System

Environmental Management System

DGL Environmental - Unanderra

EMS V2 – 2023

Table of Contents

Overview

Protecting the Environment has become a very important issue within the community and our clients. As such, DGL Group is committed to ensuring the Environmental impact of our works is considered, and minimised.

The Environmental Management System (EMS) is to apply to offices of DGL Group and any site under management by the company, along with any project involving its employees.

Failure to comply with the requirements of the Environmental Management System will lead to disciplinary action.

The purpose of this system is to establish and maintain the effective management of environmental impacts. It is also designed to promote excellence in environmental management through a process of continual improvement.

DGL Group has implemented a structured environmental management system to achieve a consistently high standard of performance. In addition, it will serve to ensure DGL Group meets the obligations of its internal Environmental Policy and relevant legislation/standards.

DGL Group will review this system regularly in order to provide guidance for internal/external consultation, development and improvement processes. More frequent reviews will take place in response to organisational and legislative changes.

DGL Group recognises that the success of the system depends on commitment from all levels and functions, particularly the leadership of management. DGL Group has defined an Environmental Policy and Objectives, and plans to implement, monitor, and evaluate its procedures which give effect to the Environmental policy and objectives; and achieve conformance with such planned procedures.

The policy and procedures are formally authorised and approved by the General Manager by signing the document. The Environmental Management System will be released as a controlled document and the controlling authority shall be the designated representative. This will be managed under the quality control system currently maintained by DGL Group. The General Manager also has been assigned custody to ensure the procedure is maintained and updated.

1. ENVIRONMENTAL POLICY

Objective

DGL Group is able to demonstrate an active, consultative commitment to minimising environmental impact across its business operations.

1.1. Environmental Policy

DGL Group has developed and implemented an environmental policy, supplemented by an environmental management system to meet its obligations and legislative requirements. This will also assist to achieve a consistently high standard of environmental performance. Regular review of the EMS at senior level reinforces its importance to DGL Group's commercial objectives and legal obligations.

1.2. Policy Authorised by Senior Management

The General Manager will formally sign and date the current written policy and display it in the designated areas. The General Manager will formally approve the policy and procedures.

The General Manager reviews the documented Environmental Policy every year.

1.3. Policy Incorporates Management Commitment to Comply with Relevant Legislation

DGL Group's Environmental Policy will ensure compliance with legislative requirements and current industrial standards such as:

- Environment Protection and Biodiversity Conservation Act for relevant state.
- Various Codes of Practice.
- AS/NZS ISO 14001 ~ Environmental Management Systems.
- Environmental Protection Act for relevant State.

1.4. Policy Includes Management Responsibilities

DGL Group has delegated general and specific environmental responsibilities applicable to the various management levels of the organisation. The responsibilities are assigned to the levels of management as shown below.

Further individual responsibilities are contained in particular procedures and position descriptions.

Every level participates in the establishment and maintenance of the environmental controls as well as assisting in planning.

DGL Group's Environmental Policy is to inform employees and other interested parties that Environmental Management is an integral part of its operations. All employees are actively involved in the review and continual improvement of Environmental performance as this reinforces the company's objectives.

General Responsibilities

General Manager

- Formally approve the Environmental Policy & EMS,
- Assign custody to ensure procedure is maintained and updated,
- Formally approve the Environmental Procedures,
- Review overall organisational Environmental performance,
- Participate where required in the resolution of environmental issues,
- Review serious environmental accidents/incidents and monitor corrective actions,
- Review environmental performance of middle management,
- Ensure organisational compliance with relevant legislation.

Supervisors

- Implement the Environmental Policy, EMS, and legislative requirements,
- Monitor environmental performance within area of responsibility,
- Demonstrate commitment to environmental impact through participation in formal and informal discussions, workplace visits and inspections, etc.
- Participate, where required, in the resolution of environmental issues,
- Investigate all environmental incidents within area of responsibility,
- Ensure liaison with employees, particularly on any workplace changes which have an impact on the environmental component,
- Initiate actions to improve environmental impact of operations within area of responsibility,
- Actively monitor the workplace to determine presence of hazards to the environment and take appropriate action to rectify any hazards found,
- Participate in consultation,
- Ensure all employees receive regular training as required to perform jobs safely.

1.5. Individual Employees Responsibilities

Employees will:

- Adhere to all working procedures in accordance with instructions,
- Ensure environmental impact is considered as part of pre-job planning,
- Participate in all training as requested,
- Participate in the consultation process.

1.6. Consultation

DGL Group is committed to consultation and co-operation between management and employees, to any change or input to the EMS (including the Environmental Policy) that will affect the workplace.

1.7. Reporting and Recording of Environmental Incidents

DGL Group has a strict procedure for internal and external reporting and recording of work-related incident, injury, or illness. This is also to be utilised for environmental incidents.

1.8. Continuous Improvement in Environmental Management

DGL Group environmental process is subject to regular reviews when factors likely to affect the degree of risks or the context such as changes in the organisation, materials, work procedures, work location, processes or methods occur. There are standards related to the type or frequency of monitoring and review activities such as inspections and audits.

As time proceeds new information comes to light in terms of risk and controls; therefore, the environmental assessment needs to be repeated regularly. Repeating the assessment process with rigorous acceptability criteria also promotes continual improvement in managing environmental impact.

Environmental Policy Statement

DGL Group is committed to undertaking business in a manner that is environmentally responsible, having due regard for standards and expectations of the community and the relevant environment legislation and regulations. Any customer and community specified environmental requirements or issues are also observed as part of our commitment to meeting and satisfying our requirements.

Minimising our environmental impact, and care for the environment is the responsibility of all DGL Group personnel and contractors at every level of the Company.

To achieve this stated policy outcome, the commitment and contribution of each and every employee is required through:

- Taking responsibility for ensuring they are familiar with and adhere to the EMS,
- Providing & participating in all relevant training,
- Considering environmental impact as an integral part of our work.

DGL Group promotes a work environment and environmental management system that is characterised by:

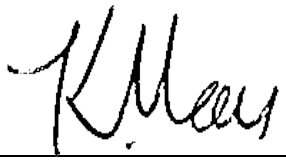
- A systematic approach to controlling environmental hazards and risks through the development and implementation of suitable policies and procedures,
- Effective management demonstrated by commitment and direct involvement at all levels of the company,
- Outperforming teamwork with effective two-way communication as an integral part of every job,
- Provision of appropriate facilities, equipment, education, training and supervision for employees and contractors.

In its activities DGL Group is committed to ensure all work sites are maintained to prevent unacceptable risks to employees and the environment. This will be achieved by:

Ensuring there is a system in place aimed at protecting the environment and preventing pollution.

Developing a continual educational program on environmental awareness that will be disseminated to all employees and contractors.

Facilitating continuous improvement through periodic review of objectives and performance measures, systems, practices, and procedures to ensure their continued effectiveness and relevance.



Signed by General Manager

21/11/2023

Dated

2. LEGAL AND OTHER REQUIREMENTS

Overview

DGL Group is subject to several legal requirements regarding its environmental aspects. DGL Group's legal officer monitors our legal obligations and keeps them up to date. We are also subject to several other non-legal requirements regarding its environmental aspects.

The Register of Legal and Other Requirements details the specific requirements applicable and shows how the requirements apply to the organisation's environmental aspects. It is maintained by the environmental co-ordinator. The environmental co-ordinator is also responsible for reporting on

changing legal and other requirements related to the organisation's environmental aspects in management reviews.

Our legal and other requirements are taken into account in establishing, implementing and maintaining the environmental management system.

2.1. Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the central environmental legislation for the Commonwealth Government. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places defined in the Act as matters of national environmental significance.

The Act requires the principles of ecologically sustainable development to be taken into account for a new development proposal if that proposal is likely to a result in a significant impact on the environment.

Section 516A requires Commonwealth Government agencies to include a report on environmental matters in their annual reports. These reports must:

- Say how the agency's activities have accorded with the principles of Ecologically Sustainable Development,
- Identify how agency outcomes contributed to Ecologically Sustainable Development,
- Document the agency's impacts on the environment and measures taken to minimise those impacts,
- Identify the review mechanisms in place to review and increase the effectiveness of the measures the agency takes to minimise its environmental impact.

The Act clarifies that for s. 516A, activities include the development and implementation of policies, plans, programs, and legislation.

The Department of the Environment, Water, Heritage, and the Arts has developed reporting guidelines to assist Commonwealth agencies in implementing section 516A.

Environment Protection (Impact of Proposals) Act 1974

Significant environmental matters must be fully examined and taken into consideration in relation to actions, proposals and decisions taken on or behalf of the Commonwealth Government and its agencies.

Environment Protection (Sea Dumping) Act 1981

This Act regulates the loading and dumping of waste at sea to protect waters surrounding Australia's coastline. The Act fulfils Australia's international obligations under the London Protocol to prevent marine pollution by dumping of wastes and other matter. Permits are required from the Department of the Environment, Water, Heritage, and the Arts for all ocean disposal activities.

National Environment Protection Council Act 1994

Establishes the National Environment Protection Council (NEPC). This is a national ministerial body which makes national environment protection measures to ensure that Australians have equivalent protection from air, water, soil, and noise pollution. This Act is mirrored in all States and Territories.

National Environment Protection Measures (Implementation) Act 1998

This Act provides for the implementation of National Environment Protection Measures (NEPMs) for certain activities carried on by or on behalf of the Commonwealth and Commonwealth authorities, and for related purposes.

State and Territory laws implementing national environment protection measures do not apply to the activities of the Commonwealth or Commonwealth authorities. However, under this Act, the Environment Minister may (subject to considerations of national interest or administrative efficiency) apply those State or Territory laws to the activities of the Commonwealth or Commonwealth authorities in other places. If NEPMs are not implemented in relation to the activities of the Commonwealth or Commonwealth authorities they can be implemented by regulations; or if there are no regulations, through environmental audits and environment management plans.

National Greenhouse and Energy Reporting Act 2007

The National Greenhouse and Energy Reporting Act 2007 (the Act) was passed on 29 September 2007 establishing a mandatory reporting system for corporate greenhouse gas emissions and energy production and consumption. The first reporting period under the Act commenced on 1 July 2008.

Key features of the Act are:

- Reporting of greenhouse gas emissions, energy consumption and production by large corporations,
- Public disclosure of corporate level greenhouse gas emissions and energy information,
- Consistent and comparable data available for decision making, in particular, the development of the Carbon Pollution Reduction Scheme.

Motor Vehicles Standards Act 1989

Imposes emission standards for exhaust fumes on road vehicles and their component parts.

Clean Energy Act 2011

Reduce greenhouse gas Emissions and encourage the use of and investment in Clean Energy.

Ozone Protection and Synthetic Greenhouse Gas Management Act 1989

Controls the use of goods that are known to cause destruction of the ozone layer. The contents of this Act are mirrored in similar Acts in all States and Territories.

Agricultural and Veterinary Chemicals Act 1994

Provides for the evaluation, registration, and control of agricultural and veterinary chemical products in the ACT and is mirrored by similar legislation in all the other Australian States and Territories.

Industrial Chemicals (Notification and Assessment) Act 1989

Deals with the importation, storage, use, transportation, and handling of these substances.

Australian Heritage Council Act 2003

Provides for the identification and preservation at a Commonwealth level of aspects of the natural environment of national interest.

Natural Heritage Trust of Australia Act 1997

This Act establishes the Natural Heritage Trust of Australia Reserve. This Act also establishes the Natural Heritage Trust Advisory Committee.

The main objective of the establishment of the Reserve is to conserve, repair and replenish Australia's natural capital infrastructure. Money in the Reserve will be spent on the environment, sustainable agriculture, and natural resources management.

This Act has been developed to redress the current decline, and to prevent further decline, in the quality of Australia's natural environment.

Water Act 2007 and Water Efficiency Labelling and Standards Act 2005

There is a growing need to reduce water consumption across Australia as populations increase and climate change results in more frequent extreme dry weather conditions. Water shortages and longer-term security of water supply are an increasing concern for many of our major cities. To help to reduce urban water consumption on a national scale, the Australian Government, in collaboration with State and Territory governments, has introduced a Water Efficiency Labelling and Standards (WELS) Scheme, which applies national mandatory water efficiency labelling and minimum performance standards to household water-using products.

2.2. National Policies

Intergovernmental Agreement on the Environment (IGAE) 1992

The IGAE was developed between the Commonwealth, States and Territories, and attempts to define environmental policy and management responsibilities of each level of government. In some areas, particularly pollution control and waste management, the IGAE sets up procedures which aim to produce common environmental standards and guidelines throughout Australia.

National Packaging Covenant

The National Packaging Covenant is a voluntary initiative by government and Industry, to reduce the environmental effects of packaging on the environment. It is designed to minimise the environmental impacts arising from the disposal of used packaging, conserve resources through better design and production processes and facilitate the re-use and recycling of used packaging materials.

National Strategy for Ecologically Sustainable Development

The National Strategy for Ecologically Sustainable Development (NSESD) provides broad strategic directions and framework for governments to direct policy and decision-making. The Strategy facilitates a co-ordinated and co-operative approach to ecologically sustainable development (ESD) and encourages long-term benefits for Australia over short-term gains.

The NSESD addresses many key areas for action identified in Agenda 21. These include issues across a number of sectors such as manufacturing, agriculture, and mining; and also cover broader inter-sectoral issues such as gender, native vegetation, pricing and taxation, coastal zone management, education, and training. To ensure the goals and values of all Australians were included, the Strategy was developed in consultation with the community, industries, interested groups, scientific organisations, governments, and individuals. Although it primarily guides the decisions of governments, the strategy is also useful for community, industry, and business groups.

The NSESD was adopted by all levels of Australian government in 1992.

Since 1992, the pursuit of ecologically sustainable development has been increasingly incorporated into the policies and programs of Australian governments as a significant policy objective (for example, the Australian Government's Environment Protection and Biodiversity Conservation Act 1999).

National Strategy for the Conservation of Australia's Biological Diversity

The goal for the National Strategy for the Conservation of Australia's Biological Diversity is to protect biological diversity and maintain ecological processes and systems. The strategy seeks to provide a systematic approach to this complex problem, drawing upon and improving existing strategies, such as the National Strategy for Ecologically Sustainable Development, with regard to their protection of Australia's biodiversity.

Commonwealth Procurement Guidelines (December 2008)

The Commonwealth Procurement Guidelines (CPGs) establish the core procurement policy framework and articulate the Government's expectations of all departments and agencies (agencies) subject to the Financial Management and Accountability Act 1997 (FMA Act) and their officials, when performing duties in relation to procurement. The CPGs establish the procurement policy framework within which agencies determine their own specific procurement practices.

Chief Executive's Instructions and Operational Guidelines for Procurement is a part of the Good Procurement Practice (GPP) series published by the Department of Finance and Administration. The purpose of the GPP booklets is to explain procurement policy in practical terms and to provide examples of good practice. The booklets support the CPGs and the relevant Financial Management Guidance publications. The series is not intended to be binding on agencies but rather to assist agencies.

2.3. State Legislation

New South Wales legislation

- Coastal Protection Act 1979,
- Contaminated Land Management Act 1997,
- Dangerous Goods (Road and Rail Transport) Act 2008,
- Environmentally Hazardous Chemicals Act 1985,
- Environmental Planning and Assessment Act 1979,
- Environmental Trust Act 1998,
- Forestry Act 2012,
- Heritage Act 1977,
- Marine Parks Act 1997,
- Mining Act 1992,
- National Environment Protection Council (NSW) Act 1995,
- National Parks and Wildlife Act 1974,
- Native Vegetation Act 2003,
- Ozone Protection Act 1989,
- Plantations and Reafforestation Act 1999,
- Pesticides Act 1999,
- Protection of the Environment Administration Act 1991,
- Protection of the Environment Operations Act 1997,
- Radiation Control Act 1990,
- Recreation Vehicles Act 1983,
- Road Transport Act 2013,
- Soil Conservation Act 1938,
- Threatened Species Conservation Act 1995,
- Waste Avoidance and Resource Recovery Act 2001,
- Wilderness Act 1987.

Victorian legislation

- Catchment and Land Protection Act 1994,
- Climate Change Act 2010,
- Climate Change and Environment Protection Amendment Act 2012,
- Conservation, Forests and Lands Act 1987,
- Dangerous Goods Act 1985,
- Environment Protection Act 1970,
- Environmental Protection (Resource Efficiency) Act 2002,
- Flora and Fauna Guarantee Act 1988,
- Land Act 1958,
- National Parks Act 1975,
- National Environment Protection Council (Victoria) Act 1995,
- Planning and Environment Act 1987,
- Pollution of Waters by Oils and Noxious Substances Act 1986,
- Road Safety Act 1986,
- Road Transport (Dangerous Goods) Act 1995,
- Water Act 1989,

3. PLANNING

3.1. Environmental Aspects

DGL Group has reviewed all of its activities, products, and services that it can control and influence, including planned and new developments and new and modified activities, products and services and has identified all of its environmental aspects. These are listed in a Register of Environmental Aspects.

Each identified environmental aspect is subject to a qualitative risk analysis based on likelihood and consequences of environmental impact or impact on the organisation from environment- related issues, in the context of existing measures to control the risk. Both positive and negative impacts can be considered. The risk analysis matrix is as follows:

		CONSEQUENCES				
		Catastrophic 1	Major 2	Moderate 3	Minor 4	Insignificant 5
LIKELIHOOD	A (almost certain/daily)	Extreme	Extreme	Extreme	High	High
	B (likely/weekly)	Extreme	Extreme	High	High	Medium
	C (possible/monthly)	Extreme	Extreme	High	Medium	Low
	D (unlikely/annually)	Extreme	High	Medium	Low	Low
	E (rare)	High	High	Medium	Low	Low

Likelihood refers to the possibility or frequency of an environmental impact. The organisation undertakes many routine activities that have an environmental impact on a daily or relatively frequent basis. Other activities are done less routinely, and environmental incidents can also occur. The following criteria explain the five categories of likelihood:

- Almost certain/daily: An environmental impact or impact on the organisation from an environmental-related issue is expected to occur in most circumstances or will occur on a daily basis,
- Likely/weekly: An environmental impact or impact on the organisation from an environmental- related issue will probably occur in most circumstances or will occur on a weekly basis,
- Possible/monthly: An environmental impact or impact on the organisation from an environmental-related issue could occur or will occur on a monthly basis,
- Unlikely/annually: An environmental impact or impact on the organisation from an environmental-related issue could occur but is not expected or will occur annually,
- Rare: An environmental impact or impact on the organisation from an environmental-related issue would occur only in exceptional circumstances.

The following provides criteria for determining **consequence** to the environment or the agency from an environment-related issue:

- Catastrophic: Widespread, irreparable environmental damage; loss of human life or long-term human health effects; national attention; serious litigation; over $1 million to manage consequences,
- Major: Widespread, medium to long term impact; serious human health impacts; state-wide or national attention; major breach of legal requirements; major disruption to operations; agency's reputation badly tarnished; $100,000 to $1 million to manage consequences,
- Moderate: Localised medium to long term impact; moderate contribution to climate change; moderate human health impacts requiring medical treatment; regional media attention; moderate breach of legal requirements with fine; $10,000 to $100,000 to manage consequences,
- Minor: Localised short to medium term impact; minor contribution to climate change; minor and reversible human health impacts treatable with first aid; negative publicity from local media; minor breach of legal requirements; $1000 to $10,000 to manage consequences,

- Insignificant: Limited impact to a local area but no long-term effects; concern or complaints from neighbours; no injury to people; minor technical nonconformity but no legal nonconformity; less than $1000 cost to the agency to manage consequences.

Conducting a risk analysis results in the allocating of a risk level of extreme, high, moderate, or low for each environmental aspect. Environmental aspects with an extreme or high risk are considered to be significant, that is, they have or can have a significant environmental impact.

Environmental aspects associated with a legal requirement, or another requirement to which the organisation subscribes, such as an Australian Government policy, are also considered to be significant, regardless of the outcome of the risk analysis.

Significant environmental aspects of the agency are flagged in the Register of Environmental Aspects. These are given priority for management, and are taken into account in establishing, implementing, and maintaining the agency's environmental management system.

The Register of Environmental Aspects is reviewed each year to ensure that is kept up to date. It is also reviewed if there is any change to activities, products, or services of the agency.

3.2. Objectives and Targets

Consistent with our environmental policy, measurable objectives and targets are set each year for our significant environmental aspects and recorded in a Register of Environmental Objectives and Targets. The register also lists action plans, improvement programs and controls for achieving those objectives and targets, as well as key performance indicators (KPIs) to monitor progress in achieving the objectives and targets. The register is revised each year in the management review in the item on the extent to which objectives and targets have been met.

Forms

- Register of Environmental Objectives and Targets - Form 3.1,
- Register of Environmental Aspects – Form 3.2.

Form 3.1- Register of Environmental Objectives and Targets

Aspect no.	Aspect description	Objective	Target & date	Action plan, improvement program or control	Key Performance Indicator (KPI)
1	Use of electricity for office lighting	Reduce annual electricity consumption for lighting	10% reduction 09/04/2023	Energy consumption awareness Switch off lights when not in use/room unoccupied.	kWh
2	Use of electricity for air-conditioning	Reduce annual electricity consumption for air conditioning	10% reduction 09/04/2023	Energy consumption awareness Switch off air-conditioning when not in use/room unoccupied.	kWh
3	Use of electricity for computer & other office equipment	Reduce annual electricity consumption for computer and office equipment	10% reduction 09/04/2023	Energy consumption awareness Switch off computer and equipment when not in use.	kWh
4	Consumption of paper	Reduce annual paper & printing purchases by 5%	5% reduction 09/04/2023	Track paper purchase records Double sided printing Do not print unless necessary Recyclable/recycled paper.	Paper purchase records
5	Generation of waste from employee kitchens	Segregation of waste for recycling	80% recyclables recycled by 09/04/2023	Track waste amounts Implement recycling bins in kitchens Training and information on recycling	Waste/recycling amounts
6	Use of fuels for plant/equipment	Reduce annual consumption	10% reduction by 09/04/2023	Fuel consumption awareness	Fuel purchase records
7	Use of oils and lubricants for machinery& equipment	Ensure correct disposal of oils and lubricants and recycle oil where possible	Recycle of oil and/or correct disposal	Waste disposal awareness	L oil recycled
8	Use of consumables	Ensure correct disposal of all consumables	Recycle where possible or dispose correctly	Waste disposal awareness	Use of consumables
9	Storage of chemicals; hydrocarbons; fuels; oils	Ensure correct storage – including bunding. No spill to ground	0 Spill to ground	Regular inspection of storage containers and bunding	Spills

Aspect no.	Aspect description	Objective	Target & date	Action plan, improvement program or control	Key Performance Indicator (KPI)
10	Movement of liquid (process slurries to wastewater, chemicals (caustic, lime slurry and sulphuric acid above 51%)	Ensure all pipework is maintained.	0 spill to ground	Regular maintenance and inspection of pipes	Spills

Form 3.2- Register of Environmental Aspects

No.	Environmental aspect	Associated environmental impact	Likelihood	Consequence	Risk rating	Other criteria	Significant
			A: Almost certain/daily **B: Likely/weekly** **C: Possible/monthly** **D: Unlikely/annually** **E: Rare**	**1: Catastrophic** **2: Major** **3: Moderate** **4: Minor** **5: Insignificant**	**Extreme** **High** **Medium** **Low**	**Legal requirement / Other requirement**	**Yes** **No**
1	Use of electricity for office lighting	Generation of greenhouse gases	A	4	High		Yes
2	Use of electricity for office air-conditioning	Generation of greenhouse gases	A	4	High		Yes
3	Use of electricity for computers & other office equipment	Generation of greenhouse gases	A	4	High		Yes
4	Generation of wastepaper & cardboard in office	Use of forest resources	A	4	High		Yes
5	Generation of general office waste	Use of landfill	A	5	High		Yes
6	Consumption of paper	Use of forest resources & generation of greenhouse gas	A	3	Extreme		Yes
7	Storage & use of chemicals for cleaning	Pollution of waterways	D	5	Low		No
8	Energy use in kitchen	Generation of greenhouse gases	A	4	High		Yes
9	Generation of waste from kitchen	Use of landfill	A	4	High		Yes
10	Use of water in employees' kitchens & toilets	Use of limited water resources	A	4	High		Yes

No.	Environmental aspect	Associated environmental impact	Likelihood	Consequence	Risk rating	Other criteria	Significant
11	Use of excavator, trucks, and other mobile equipment on site	Dust Noise	A	4	High		Yes
12	Storage of chemicals; hydrocarbons; fuels; oils	Loss of contaminants Spill to ground; waterways; ground water table	A	3	High		Yes
13	Movement of liquid (process slurries to wastewater) and chemicals (caustic, lime slurry and sulphuric acid above 51%)	Loss of contaminants Spill to ground; waterways; ground water table	A	3	High		Yes

4. IMPLEMENTATION AND OPERATION

Objective

DGL Group will ensure that all employees are informed of their own responsibilities for environmental management in the workplace. DGL Group will ensure that employees have specific knowledge concerning the management of environmental hazards created by tasks undertaken. This will be achieved through training in workplace procedures, environment, equipment, and materials.

4.1. Resources, Roles, Responsibility and Authority

Various positions in the organisation have roles, responsibilities, and authorities for managing environmental aspects, action plans, programs, and controls. All of these roles, responsibilities and authorities are documented in a Responsibility Matrix.

A special management role of environmental co-ordinator has responsibility for overall co- ordination of the environmental management system in accordance with the requirements of AS/NZS ISO 14001:2016 and reporting its performance, including recommendations for improvement, to top management for review. The specific tasks associated with this role include:

- Maintenance of the Register of Environmental Aspects,
- Maintenance of the Register of Legal and Other Requirements,
- Maintenance of the Register of Environmental Objectives and Targets,
- Maintenance of the Responsibility Matrix, including records of incumbents in positions and roles, competence requirements, competence possessed, training needs, training plans and training undertaken,
- Assessment of general environmental awareness of employees and contractors,
- Control of documents, forms and records required by the EMS,
- Co-ordination of environmental monitoring and measurement,
- Evaluation of compliance with legal and other requirements relevant to the EMS,
- Management of the internal audit program,
- Co-ordination of corrective and preventive action,
- Maintenance of the emergency preparedness and response procedure and management of testing the procedure,
- Co-ordination of management review of the EMS.

4.2. Competence, Training and Awareness

Positions and roles which have responsibility for an activity, product or service that has the potential to cause a significant environmental impact are also included in the Responsibility Matrix, along with competence requirements of each position and role. Competence refers to the knowledge, understanding, skills or abilities required for a person to effectively and efficiently carry out the position or role. Competence can be determined through appropriate education, training, experience, and assessment.

For each person in each position and role, competence possessed, training needs, and training or other personal development undertaken to acquire the required competence are also recorded in the Responsibility Matrix. Copies of education and training qualifications are maintained in personnel files.

The Responsibility Matrix is updated as required with changes to positions, roles and employees, and training or other personal development undertaken.

General awareness of the organisation's environmental management system is propagated through an EMS training package provided during induction of employees and contractors, as well as in refresher sessions. General EMS awareness is assessed following the induction and refresher sessions, and records of assessment are maintained with the employees' members training records.

More specific training on DGL Group's Environmental Management System is provided on documented operational procedures and emergency preparedness and response as required. Records of such training are made in the Responsibility Matrix.

4.3. Communication

Information about the organisation's environmental aspects and environmental management system is communicated among the levels and functions of the organisation through:

- EMS awareness package provided during induction and at refresher sessions,
- Provision of this manual and supporting documentation as requested,
- Monthly employees meetings.

Communication received from external parties regarding the organisation's environmental management is managed in the same way as formal communication received by the organisation on all issues. However, it is also tracked in the organisation's environmental corrective and preventive action process by the environmental co-ordinator. The environmental co-ordinator is also responsible for reporting on communication from external interested parties, including complaints, in management reviews.

External communication required during response to emergency situations and accidents is documented in its emergency response plan.

The organisation will decide on a case-by-case basis whether to communicate externally about its significant aspects. Top management and the environmental co-ordinator will be involved in making this decision. Records of all communication will be kept, including the organisation's responses, and the communication will be tracked in the agency's environmental corrective and preventive action process.

4.4. Documentation

A Register of Documents and Records lists policies, manuals, procedures, plans, external documents, registers, forms, templates, and records relevant to the environmental management system.

4.5. Control of Documents

All environmental management system documents are filed within the organisation's record management system. Each internal document is identified by a unique name and a last updated date and listed in the Register of Documents and Records. Each external document required for the environmental management system is also recorded in this register.

This EMS manual specifies the frequency for which certain documented information is revised. For example, the environmental policy, environmental aspects, legal and other requirements, and objectives and targets must be revised at least annually, while the Responsibility Matrix requires monthly revision.

DGL Group's environmental management system documents are dynamic pieces of information used to guide what people do—they need to be kept up to date and relevant to the organisation's needs. Changes to the environmental policy, this EMS manual, a documented procedure, an environmental management plan, a form, or any register or matrix referenced in this manual require approval from the environmental co-ordinator. Corrective and preventive action resulting from identification of actual and potential nonconformities often results in recommendations for changes to documents. Suggestions for improvement to documents can also be made directly on corrective and preventive action records.

Managers are expected to promote relevant and significant changes to documents to their employees.

The immediate earlier version of a revised document is stored as a record, to which only the environmental co-ordinator and the system administrator have access.

4.6. Operational Control

Operational control procedures are documented in the Appendix section of this document.

4.7. Emergency Preparedness and Response

DGL Group identifies potential emergencies and accidents that can have an environmental impact during the identification of environmental aspects. Environmental emergencies and accidents are therefore subject to risk analysis and determination of environmental significance and handled accordingly in the environmental management system. Objectives and targets are set for environmental emergencies and accidents that are regarded as significant environmental aspects and an emergency response plan is established to achieve the objectives and targets.

Environmental emergencies and accidents are regarded as environmental nonconformities. Accordingly, in the event of an occurrence, immediate action is taken to mitigate the environmental impact, followed by corrective action to avoid a recurrence.

The emergency response plan is tested in each building each quarter. Planned tests are recorded in a Register of Emergency Response Tests. The organisation's emergency preparedness and response are reviewed after every test and after the occurrence of each environmental emergency and accident using the Emergency Test and Incident Review Form. The aspect identification and significant impact determination of an environmental emergency or accident, and the organisation's emergency response plan are revised where appropriate after a review.

Forms

- Responsibility Matrix – Form 4.1,
- Register of Documents and Records – Form 4.2,
- Register of Emergency Response Tests – Form 4.3,
- Emergency Test and Incident Review form – Form 4.4.

Form 4.1- Responsibility Matrix, Training Needs Analysis and Training Plan

Role / Position	Name	Responsibilities	Qualifications/ competency	Training needs	Planned dates	Training details	Remarks
General Manager		• Participate in Management review, • Setting Policy, • Reviewing Objective & Targets, • Resource allocation.	Senior Business Administrator	EMS awareness (in house)			
Project Co-ordinator		• Participate in Management review, • Implementing environmental policy, • Implementing programs for achieving set objectives & targets, • Monitoring and measurement of environmental performance, • Overall responsibility for system implementation, • Conducting internal audits as per schedule.		Auditing Course EMS Awareness (in house)			
EMS committee members		• Awareness on Policy & EMS, • Implementing program for achieving set Objective & Targets, • Helping in Monitoring and measurement, • Training respective employees in implementing the waste management strategy.	EMS administration	EMS Awareness (in house)			
Employees		• Awareness on Policy & EMS.	N/A	EMS Awareness (in house)			

Form 4.2- Register of Documents and Records

Part A: Policy, manual, procedures, plans and external documents.

Document reference	Brief description of document
EMS Manual	Description of the scope of the environmental management system, and the documented procedures that underlie the system
Environmental Policy	Statement of the organisation's commitments to its environmental management system.
Emergency Response Plan	Procedures for responding to a comprehensive range of emergency situations that may affect the organization.
Detailed work instructions or operational procedures relevant to the EMS	• Waste Control, • Energy Consumption, • Noise, • Water Pollution, • Fauna and Flora.
Documents associated with environmental action plans e.g., energy savings plan	
Legislation & regulations relevant to the EMS	
Government policies relevant to the EMS	
AS/NZS ISO 14001:2016	Requirements for environmental management systems
Other external documents	

Part B: Registers, forms, and templates

Form or template reference	Brief description of form or template
Register of Environmental Aspects	Register of environmental aspects with their risk score
Register of Environmental Objectives & Targets	Register of environmental objectives, targets, and action plans for significant environmental aspects
Register of Legal and Other Requirements	Register showing how legal and other requirements apply to environmental aspects, with provision for evaluation of compliance
Responsibility Matrix	Identifies responsibilities and authorities of positions, roles, and individuals for managing environmental aspects and the environmental management system, and of individuals performing tasks that have a potential to cause a significant environmental impact; also, records competencies and identifies training needs, and plans the delivery of training.
Assessment of General Environmental Management System Awareness	Questionnaire to assess awareness and competency about environmental management system.
Generic Internal Audit Checklist	Generic checklist for internal audit of environmental management system to requirements of AS/NZS ISO 14001:2016
Internal Audit Report Template	Template for internal audit reports of environmental management system
Generic Internal Audit Schedule	Generic schedule for internal audit of environmental management system for a single site agency
Register of Environmental Nonconformity and Suggestions for Improvement	Register of actual and potential environmental nonconformity and suggestions for improvement to the environmental management system managed with corrective and preventive action
Corrective and Preventive Action Form	Form for managing nonconformity and suggestions for improvement with corrective and preventive action

Form or template reference	Brief description of form or template
Register of Emergency Response Tests	Register used for planning tests of emergency preparedness and response
Emergency Test and Incident Review Form	Form for reviewing each test of emergency preparedness and response, and actual emergencies and accidents
Schedule Monitoring & Measurement	Annual table for monthly monitoring and measurement of key characteristics of the environmental management system
Management Review Template	Template for a briefing in preparation for a management review of the environmental management system
Register of Documents and Records	This form.

Part C: Records

Record reference	Brief description of record	Storage location	Retention time
Register of Environmental Aspects	Annual register of environmental aspects with their risk analysis and determination of significance		
Register of Environmental Objectives & Targets	Annual register of environmental objectives, targets, and action plans for significant environmental aspects		
Register of Legal and Other Requirements	On-going register showing how legal and other requirements apply to environmental aspects, with provision for evaluation of compliance		
Responsibility Matrix	Identifies responsibilities and authorities of positions, roles, and individuals for managing environmental aspects and the environmental management system, and of individuals performing tasks that have		

	a potential to cause a significant environmental impact; also, records competencies and identifies training needs, and plans the delivery of training.		
Assessment of General Environmental Management System Awareness	Questionnaire to assess awareness and competency about environmental management system		
Internal Audits	Schedules, completed checklists, and reports for internal audit of environmental management system		
Register of Environmental Nonconformity & Suggestions for Improvement	Register of corrective and preventive actions taken on actual and potential nonconformities and suggestions for improvement		
Corrective & Preventive Action Records	Completed forms to record corrective and preventive action		
Register of Emergency Response Tests	Register of planned tests of emergency preparedness and response		
Emergency Test & Incident Reviews	Completed reviews of tests of emergency preparedness and response and actual emergencies and accidents		
Monitoring & Measurement Records	Annual tables for monthly monitoring and measurement of key characteristics of the environmental management system		
Management Review	Records of management review		
Documents and Records	Registers of documents, forms and templates, and records		

Form 4.3- Register of Emergency Response Tests

No.	Description of emergency response test	Planned date	Responsibility	Remarks

Form 4.4- Emergency Test and Incident Review Form

Incident type	**Spill** ☐	**Fire** ☐	**Gas leak** ☐	**Bomb threat** ☐	**Other: …** ☐
Drill ☐ **Incident** ☐		**Responsibility/Supervisor:**		**Assisted by:**	
Date:	**Start time:**	**End time:**	**No. employees participated:**		
Description of emergency drill conducted or actual incident:					
Observations / compliance with procedures:					
What could be improved (with underlying or root cause if appropriate)?					
Nonconformity or preventive action raised? (If so, put CPA number here):					
Completed by:	**Date:**	**Remarks:**			

5. CHECKING

5.1. Monitoring and Measurement

An annual Schedule of Monitoring and Measurement is used to record data on the organisation's environmental performance on a monthly basis.

The environmental co-ordinator is responsible for analysing the results of monitoring and measurement and reporting on the environmental performance of the organisation, in particular the extent to which environmental objectives and targets have been met, in management reviews.

Monitoring and measurement are also carried out in line with environmental licence conditions.

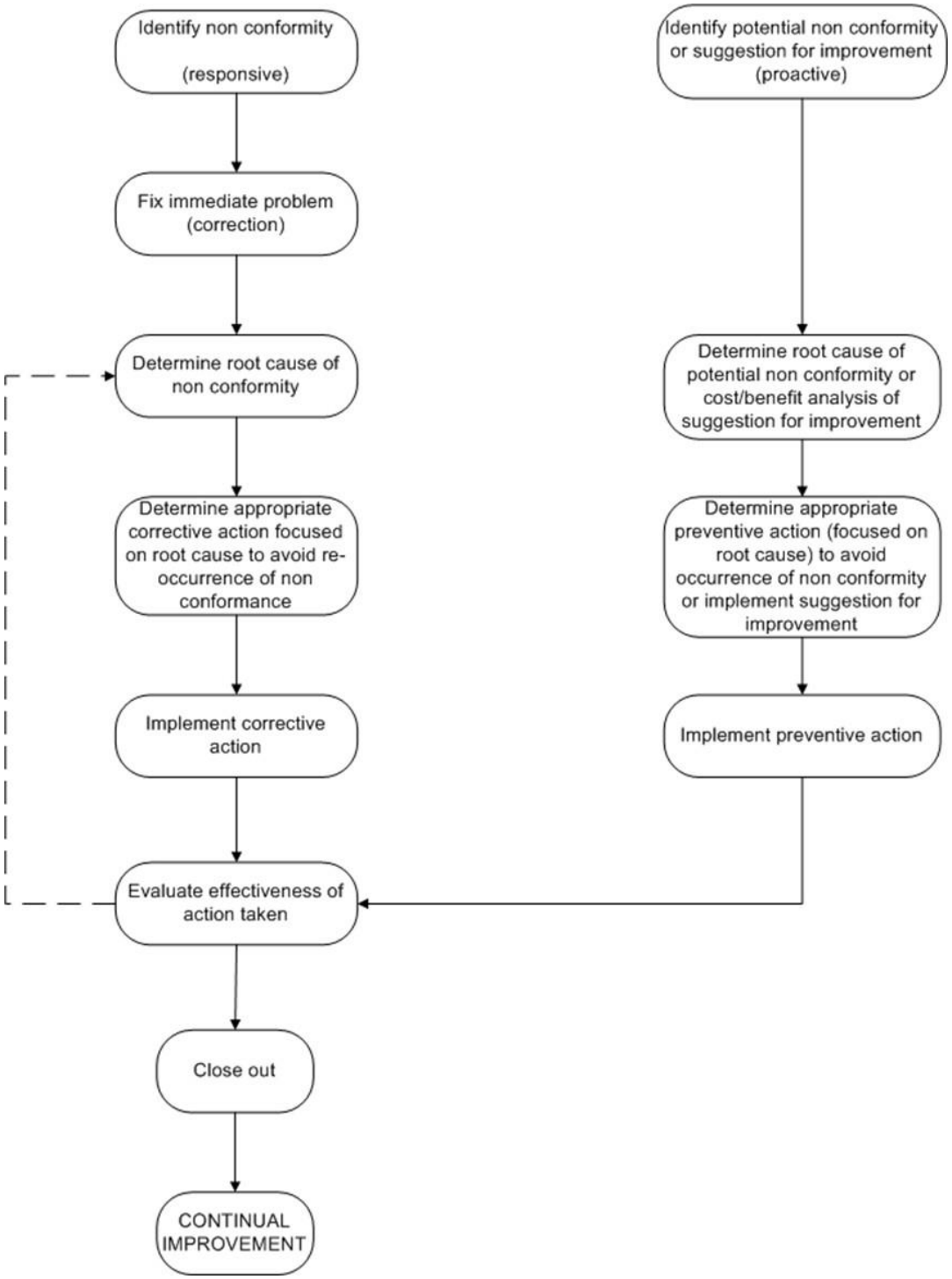
5.2. Evaluation of Compliance

Once a year, a review or compliance audit is conducted to evaluate compliance with legal requirements applicable to the DGL Group and other requirements to which the organisation subscribes. This is undertaken by completing the following two columns in the Register of Legal and Other Requirements:

- Evidence required for compliance,
- Evaluation of compliance (yes/no).

The register that is completed in this review or compliance audit becomes a record of the evaluation of compliance. Where non-compliance is detected, this is followed up with corrective action (see 5.3 below).

5.3. Nonconformity, Corrective Action, and Preventive Action



The above flowchart illustrates the organisation's process for identifying actual and potential environmental nonconformity, recording suggestions for improvement to environmental management, taking appropriate action to correct nonconformity and mitigate environmental impact, taking corrective action to avoid recurrence of nonconformity and taking preventive action to avoid occurrence of nonconformity or implement a suggestion.

This process has the ultimate goal of driving continual improvement of the environmental management system.

Actual and potential nonconformity is identified and suggestions for improvement are made by the following means:

- Internal audit,
- External audit,
- Site inspections,
- Feedback from external parties,
- Complaints from customers or other stakeholders,
- Suggestions for improvement from employees and contractors,
- Occurrence of environmental emergencies and accidents,
- Testing of emergency preparedness and response,
- Management review.

The environmental co-ordinator is responsible for maintaining a Register of Environmental Nonconformity and Suggestions for Improvement to Environmental Management. Each record in this register is given a Corrective and Preventive Action Number (CPA No.) and is associated with a Corrective and Preventive Action Form used to analyse nonconformity and suggestions for improvement and manage action taken. The Corrective and Preventive Action Form provides for the following:

The taking of immediate action to correct the nonconformity (i.e., correction) and mitigate environmental impact.

- Root cause analysis of actual nonconformity,
- The taking of corrective action addressing the root cause to avoid recurrence of nonconformity, or the taking of preventive action to avoid occurrence of nonconformity or implement a suggestion for improvement,
- Evaluation of the effectiveness of the action taken,
- Close out,
- Corrective and preventive action often requires changes to environmental system documentation. In such cases, this process feeds into the process for control of documents.

The environmental co-ordinator is responsible for reporting on the status of corrective and preventive action in management reviews.

5.4. Control of Records

Records required by the agency's environmental management system are listed in the Register of Documents and Records. In this register, records are given an identifier and a description, and their location and retention period are recorded.

An Archives Register lists all paper records relevant to the environmental management system held in archival storage, and their disposal date and means.

Records required by the environmental management system are primarily stored electronically. Records originating in paper form are scanned, after which the electronic version is the controlled version.

5.5. Internal Audit

The organisation has established and implemented an annual internal audit program with the objective of determining whether the environmental management system conforms to planned arrangements, including the requirements of AS/NZS ISO 14001:2016 and this EMS manual, and has been properly implemented and maintained.

The environmental co-ordinator manages the internal audit program and reports the results of internal audits and the effectiveness of the program to top management.

The internal audit program covers all of the organisation's operations units and functions, environmental management system elements, and the full geographical scope of the agency's environmental management system over the year. Some units, functions, elements, and sites may be audited more than once annually if

justified on the basis of environmental risk. The program also provides for additional audits that may be required to follow up scheduled audits.

Internal audits are scheduled each month except December and January, when many employees are on leave, and June, which is the financial year end.

Audit criteria in the program include the requirements of AS/NZS ISO 14001:2016 for environmental management systems, the requirements of this EMS manual, the requirements of work instructions listed in this manual to control operational activities associated with significant environmental aspects, and legal and other requirements.

One audit each year is devoted to evaluating compliance with legal and other requirements. The Register of Legal and Other Requirements is used to record the evidence and findings of this audit.

An Internal Audit Checklist is used to record evidence for audits of the requirements of AS/NZS ISO 14001:2016 and this EMS manual. Findings of such audits are reported using an Internal Audit Report Template.

Internal auditors of the environmental management system must attend a course on environmental management systems and a course on internal auditing as a minimum requirement before being allowed to conduct an audit on their own. Auditors are encouraged and supported by the agency to achieve certificates of attainment in environmental management systems and auditing/lead auditing.

Auditors are selected for audits with a view to ensuring objectivity and impartiality of the audit process. That is, an auditor cannot audit the section in which he or she normally works.

Nonconformities raised in internal audits are entered into the Register of Environmental Nonconformity and Suggestions for Improvement to Environmental Management, and subject to appropriate corrective and preventive action.

Forms

- Register of Environmental Nonconformity and Suggestions for Improvement – Form 5.1 Corrective and Preventive Action Form – Form 5.2,
- Register of Documents and Records – Form 4.2 Internal Audit Schedule – Form 5.3,
- Register of Legal and Other Requirements – Form 5.4 Internal Audit Checklist – Form 5.5,
- Internal Audit Report Template – Form 5.6 Archives Register – Form 5.7,
- Schedule of Monitoring and Measurement – Form 5.8.

Form 5.1- Register of Nonconformity and Suggestions for improvement

CPA no.	Description	Category	Raised by	Assigned to	Assigned date	Close date	Remarks

Form 5.2- Corrective and Preventive Action Form

CPA No.	**Environmental incident ☐**	**Nonconformity from audits ☐**	**System failure ☐**	**From complaints/notices/external parties ☐**
	Other ☐ …….			
Category	**Document control ☐**	**Suggestion for improvement ☐**	**Wrong instruction ☐**	**Training ☐**
	Contractor fault ☐	**Operator fault ☐**		

Raised by:	**Assigned to:**	**Date:**	**Remarks:**
Description:			
Proposed immediate action (correction):			
Completed by:	**Date:**	**Remarks:**	
Root cause analysis required: Yes ☐ No ☐			
Underlying / root cause:			
Determined by:	**Date:**	**Remarks:**	
Proposed action for long term solution (corrective/preventive action):			
Completed by:	**Date:**	**Remarks:**	
Comments on effectiveness of action taken:			
Closed out by:	**Date:**	**Remarks:**	

Form 5.3- Internal Audit Schedule

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Policy												
Environmental aspects												
Legal & other requirements												
Objectives, targets, programs												
Resources, roles, responsibility, authority												
Competence, training, awareness												
Communication												
Documentation												
Control of documents												
Operational control												
Emergency preparedness & response												
Monitoring & measurement												
Evaluation of compliance												
Nonconformity, corrective & preventive action												
Control of records												
Internal audit												
Management review												

Form 5.4- Register of Legal and Other Requirements

Aspect No.	Environmental aspect description	Legal or other requirement	Source	Evidence required for compliance	Evaluation of compliance (yes/no)
1	Use of electricity for office lighting	Targets for energy use, and annual reporting of energy performance to DEWHA	Energy Efficiency in Government Operations (EEGO) Policy	Monitoring of energy use, and current annual report to DEWHA of energy performance	No
2	Use of electricity for office air-conditioning				
3	Use of electricity for computers & other office equipment				
13	Energy use in kitchen				
4	Generation of wastepaper & cardboard in office	Monitoring of waste management, waste audits, waste management plan, provision of infrastructure to facilitate recycling	National Government Waste Reduction & Purchasing Guidelines; ACT No Waste By 2010 Management Strategy	Current annual report on progress of waste management plan	No
5	Generation of general office waste				
8	Generation of waste from employees kitchen				
10	Use of water in employees kitchens & toilets	Targets for water use	Permanent Water Conservation Measures under Utilities (Water Conservation) Regulation 2006 (ACT)	Complete records of monitoring water use;	No

Aspect No.	Environmental aspect description	Legal or other requirement	Source	Evidence required for compliance	Evaluation of compliance (yes/no)
13	Use of excavator, trucks, and other mobile equipment on site	Monitoring of waste management, waste audits, waste management plan, provision of infrastructure to facilitate recycling	Environment Operations Act 1997		
14	Storage of chemicals; hydrocarbons; fuels; oils	Environment Operations Act 1997 ADGC AS2780-2008 The Storage & Handling of Corrosive Substances	Environment Operations Act 1997		
15	Movement of liquid (process slurries to wastewater, chemicals (caustic, lime slurry and sulphuric acid above 51%)	Environment Operations Act 1997 ADGC AS2780-2008 The Storage & Handling of Corrosive Substances	Environment Operations Act 1997		
		Include report on environmental matters in annual report	Section 516A of Environment Protection & Biodiversity Conservation Act 1999 (Cwlth)	Comprehensive report on environmental management in latest annual report	No
		Certification of environmental management system to requirements of AS/NZS ISO 14001:2016	AS/NZS ISO 14001:2016—Environmental management systems—Requirements with guidance for use	Current certificate from accredited conformity assessment body	No

Form 5.5- Internal Audit Checklist

Prompts	Notes – Audit Evidence
4.1 SCOPE OF EMS	
• Documented scope of EMS, • Scope of certification to requirements of AS/NZS ISO 14001:2016 (if different), • Exclusions from scope of certification, • Justification of exclusions.	
4.2 ENVIRONMENTAL POLICY	
• Policy is documented, • Consistent with scope of EMS (i.e. covers whole scope and no broader), • Appropriate to nature, scale & environmental impacts of activities, products, or services, • Includes commitment to continual improvement, • Includes commitment to prevention of pollution, • Includes commitment to comply with applicable legal requirements, • Includes commitment to comply with other requirements to which organisation subscribes relating to environmental aspects (e.g. government policy, industry guidelines, voluntary agreements), • Provides framework for setting & reviewing environmental objectives & targets, • Implemented, • Maintained, • Communicated to everyone working for or on behalf of organisation (incl. contractors, volunteers, temporary employees, remote workers), • Available to public.	
4.3.1 ENVIRONMENTAL ASPECTS	
• Procedure to identify environmental aspects within scope of EMS that it can control & influence, • Procedure provides for planned or new developments, or new or modified activities, products & services, • Procedure provides for determining significant aspects (i.e. those that have or can have significant impact on the environment), • Procedure maintenance,	

Prompts	Notes – Audit Evidence
• Information on all environmental aspects documented & up-to-date (not just significant aspects), • Significant aspects are taken into account during implementation & maintenance of EMS (e.g. communication, setting environmental objectives, audit program, training/awareness, emergency preparedness).	
4.3.2 LEGAL & OTHER REQUIREMENTS	
• Procedure to identify & have up-to-date access to legal & other requirements (e.g. WPI, Greenhouse Challenge) to which your organisation subscribes directly applicable to all environmental aspects (not only significant ones) • Procedure provides for determining how these legal & other requirements apply to environmental aspects, • Responsibility for identifying and determining how requirements apply, • Procedure maintenance, • Assurance that requirements are taken into account in the EMS.	
4.3.3 OBJECTIVES, TARGETS & PROGRAMS	
• Documented environmental objectives & targets at relevant functions & levels in organization (obtain copy to check progress against several objectives & targets later*), • Objectives & targets are measurable (where practical), • Objectives & targets are consistent with the policy regarding: – prevention of pollution, – legal & other requirements, – continual improvement. • Objective & targets maintained (reviewed & updated), • Legal & other requirements & significant environmental aspects are taken into account when establishing and reviewing objectives and targets, • When setting objectives & targets, the following are considers: – technological options,	

Prompts	Notes – Audit Evidence
– financial, operational & business requirements, – view of interested parties. • Environmental programs(s), • Program(s) established for achieving environmental objectives & targets, • Responsibility for achieving objectives & targets at relevant functions & levels in organisation, • Means includes or resources allocated, • Program includes timeframe.	
4.4.1 RESOURCES, ROLES & RESPONSIBILITIES	
• Management provides resources for implementation, maintenance & improvement of EMS (resources include human resources, specialised skills, organisational infrastructure, technology, and financial resources), • Roles, responsibilities, and authorities for effective environmental management defined and documented (e.g. in position descriptions), • Roles, responsibilities, and authorities for effective environmental management communicated, • Management representative(s) responsible for EMS, • Management representative has responsibility for ensuring that EMS are established, implemented, and maintained, • Management representative has responsibility for reporting to top management on performance of EMS for review, including recommendations for improvement.	
4.4.2 COMPETENCE, TRAINING & AWARENESS	
• Determination of competence of persons performing tasks on its behalf with potential to cause significant environmental impacts, • Competency records, • Identification of training needs associated with (all) environmental aspects &EMS (including internal audit, corrective & preventive action), • Training or other action taken to meet such needs, • Training records, • Procedure on making workers aware of:	

Prompts	Notes – Audit Evidence
– significant environmental aspects & actual or potential impacts associated with their work, & environmental benefits of improved personal performance, – their roles & responsibilities in achieving conformity with requirements of the EMS (including emergency preparedness & response), – potential consequences of departure from specified operating procedures. • Procedure maintenance.	
4.4.3 COMMUNICATION	
• Procedure(s) regarding environmental aspects &EMS for: – internal communication between various levels &functions of organization, – receiving, recording & responding to external communication. • Documented decision whether to communicate externally about significant environmental aspects, • If the decision is YES, method(s) used:_____	
4.4.4 DOCUMENTATION	
• The EMS documentation includes the following: – Environmental policy (cl. 4.2), – Environmental objectives & targets (cl. 4.3.3), – Description of scope of EMS (cl. 4.1), – Description of main elements of EMS& their interaction, & reference to related documents (cl. 4.4.4), – Documents & records determined to be necessary to ensure effective planning, operation & control of processes relating to significant environmental aspects (cl. 4.4.6), – Other documents & records required by AS/NZS ISO 14001:2016, – Environmental aspects (cl. 4.3.1), – Roles, responsibilities & authorities for environmental management (cl. 4.4.1), – Records of competence (cl. 4.4.2), – Training records (cl. 4.4.2), – Decision to communicate externally (cl. 4.4.3),	

Prompts	Notes – Audit Evidence
– Records of monitoring performance, operational controls & conformity with environmental objectives & targets (cl. 4.5.1), – Records of calibration (cl. 4.5.1), – Records of evaluation of compliance (cl. 4.5.2), – Records of results of corrective & preventive action, – Records of planning & conducting internal audits (cl. 4.5.5), – Records of management reviews (cl. 4.6), – Use of the certification mark of the certification body? • Use of JAS-ANZ logo?	
4.4.5 CONTROL OF DOCUMENTS	
• Approve documents for adequacy prior to issue, • Review & update as necessary & re-approve documents, • Ensure changes & current revision status of documents are identified, • Ensure relevant versions of applicable documents are available at points of use, • Ensure documents remain legible & readily identifiable, • Ensure external documents are identified & their distribution controlled, • Prevent unintended use of obsolete documents, and apply suitable identification to them if they are retained for any purpose, • Procedure maintenance, • Documents required by EMS & AS/NZS ISO 14001:2016 & sighted in the audit are effectively controlled (record any nonconformities to this requirement).	

Prompts	Notes – Audit Evidence
4.4.6 OPERATIONAL CONTROL	
• Identification & planning of operations & activities associated with significant environmental aspects consistent with policy, objectives & targets to ensure they are carried out under specified conditions, • Establishment of documented procedures to control situations where their absence could lead to deviations from environmental policy & objectives & targets, • Procedures stipulate operating criteria, • Establishment of procedures related to significant environmental aspects of goods & services used by the organisation, • Communication of procedures & requirements to suppliers & contractors, • Procedure maintenance.	
4.4.7 EMERGENCY PREPAREDNESS & RESPONSE	
• Procedures to identify potential emergency situations &potential accidents that can have an impact(s) on the environment, • Procedure(s) includes response to emergency situations and potential accidents, • Procedures maintenance, • Actual response to actual emergency situations or accidents since last audit (especially prevention or mitigation of environmental impacts), • Periodic tests of procedure(s) where practicable, • Review & revision (where necessary) of emergency preparedness & response procedures, particularly after accidents or emergency situations.	

Prompts	Notes – Audit Evidence
4.5.1 MONITORING & MEASUREMENT	
• Procedure(s) to monitor & measure on a regular basis the key characteristics of operations that can have a significant environmental impact, • Procedure(s) includes recording of information to track: – Performance, – operational controls, – conformity with environmental objectives & targets. • Monitoring & measuring equipment is calibrated or verified, • Calibration & verification records retained & up-to-date.	
4.5.2 EVALUATION OF COMPLIANCE	
• Procedure for periodically evaluating compliance with applicable legal requirements, • Procedure for periodically evaluating compliance with other requirements to which organisation subscribes, • Procedure maintenance, • Records of the results of periodic evaluation.	
4.5.3 NONCONFORMITY, CORRECTIVE & PREVENTATIVE ACTION	
• Procedure for: – dealing with actual & potential environmental nonconformities, – taking corrective & preventive action. • Procedure defines requirements for: – identifying & correcting nonconformities& taking action to mitigate environmental impact, – investigating nonconformities, determining their cause, & taking corrective action to avoid recurrence, – evaluating need for action to prevent nonconformities & implementing preventive action to avoid occurrence (including suggestions for improvement), – recording results of corrective & preventive action,	

Prompts	Notes – Audit Evidence
– reviewing effectiveness of corrective & preventive action. • Action taken is appropriate to magnitude of problems & environmental impacts encountered, • Changes made to EMS documentation resulting from corrective & preventive action.	
4.5.4 CONTROL OF RECORDS	
• Procedures for following control of records: – Identification, – Storage, – Protection, – Retrieval, – Retention, – Disposal. • Procedure maintenance, • Environmental records are: – Legible, – Identifiable & traceable to activity, product or service involved.	
4.5.5 INTERNAL AUDIT	
• Procedure(s) for: – the responsibilities & requirements for planning & conducting audits, reporting results & retaining associated records, – determination of audit criteria, scope, frequency & methods. • Procedure maintenance, • Internal audits of EMS conducted at planned intervals: – Interval/schedule, – Last audit conducted, – Next audit planned, – Results of audits reported to management. • Audit program based on environmental importance of the operations concerned & results of previous audits (especially significant environmental aspects), • Selection of auditors & conduct of audits ensure objectivity & impartiality of audit process (e.g. training & qualifications of auditors),	

Prompts	Notes – Audit Evidence
4.6 MANAGEMENT REVIEW	
• Top management reviews EMS at planned intervals to evaluate continuing suitability, adequacy & effectiveness, • Types of (or forums for) management reviews (include only those that are holistic and strategic), • Management reviews recorded (agendas & minutes), • Input to management review includes: – results of internal audits (preferably evaluation of effectiveness of internal audit program), – evaluations of compliance with legal requirements & other requirements, – communication from external interested parties, including complaints, – environmental performance of the organization, – extent to which objectives & targets have been met, – status of corrective & preventative action, – follow up actions from previous management reviews, – changing circumstances, including developments in legal & other requirements related to environmental aspects, – recommendations for improvement (from management representative), – Output includes decisions & actions related to possible changes to environmental policy, objectives, targets, & other elements of EMS, consistent with commitment to continual improvement.	

Form 5.6- Internal Audit Report Template

Audit No.

Audit team:

Site/section/function audited:

Audit date:

AUDIT FINDINGS

Element	Code	Findings	CPA no.
Scope of EMS			
Environmental policy			
Environmental aspects			
Legal & other requirements			
Objectives, targets & programs			
Resources, roles & responsibilities			
Competence, training & awareness			
Communication			
Documentation			
Control of documents			
Operational control			
Emergency preparedness & response			
Monitoring & measurement			
Nonconformity, corrective action & preventive action			
Control of records			
Internal audit			
Management review			

Explanation of codes:

Ma = Major nonconformity

Mi = Minor nonconformity

C = Conformity

O = Observation

Form 5.7- Archives Register

Box No.	Contents	Location	Disposal Due Date	Disposal Means & Date

Form 5.8- Schedule of Monitoring and Measurement

Year:

	Unit of measure	Jan	Feb	March	April	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Remarks (comment on trends and equipment calibration status)
Electricity use	***kWh***													
Water use	***kL***													
Fuel use	***L***													
Air travel	***km***													
Waste to recycling	***kg***													
Paper	***kg***													
Toner Cartridges	***kg***													
General waste	***kg***													
Fluorescent light tubes	***kg***													
No. of non-conformities raised	#													
No. of non-conformities closed	#													
No. of internal audits or site inspections	#													

	Unit of measure	Jan	Feb	March	April	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Remarks (comment on trends and equipment calibration status)
No. of environmental incidents	#													
No. of training or awareness sessions conducted	#													
<Insert any other objectives, targets, KPIs being monitored>														

6. MANAGEMENT REVIEW

6.1. Review

Top management of DGL Group reviews the environmental management system for its continuing suitability, adequacy, and effectiveness annually. Each management review makes decisions on changes to environmental policy, the risk assessment procedure and environmental aspects, objectives and targets, environmental programs/plans, and other elements of the environmental management system.

The environmental co-ordinator compiles information for management review using the Management Review Template. The template also provides for recording the decisions of the management review, and the resulting document becomes the record of management review. Management review meetings are to be held as a minimum 6 monthly.

Forms

- Management Review Template

Form 6.1- Management Review of Environmental Management System

Date of Review	
Review Participants	
Follow-up actions from previous management reviews:	
Environmental performance of the organisation	
Extent to which objectives and targets have been met	
Results of internal audits	
Results of evaluation of compliance with legal and other requirements	
Status of corrective and preventive action	
Communication from external parties, including complaints	
Changing circumstances, including developments in legal and other requirements	
Other recommendations for improvement	
Proposed changes to environmental management system Environmental policy Risk assessment procedure and environmental aspects Objectives, targets, and programs/plans Other elements	
Date of next management review	
Record authorised by	
Date	

7. DEFINITIONS

Audit
Systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled.

Audit Criteria
Set of policies, procedures, or requirements.

Audit Evidence
Records, statement of facts or other information, which are relevant to the audit criteria and verifiable.

Auditor
Person with the competence to conduct an audit.

Authority
Justification and right to exercise a power.

Carbon Footprint
Measure of the impact that human activity has on the environment in terms of the amount of greenhouse gases produced.

Certification
Verification by a conformity assessment body that a management system conforms to the requirements of a standard.

Competence
Demonstrated personal attributes and demonstrated ability to apply knowledge and skills.

Compliance
AS 3806:2006: adhering to the requirements of laws, industry and organisational standards and codes, principles of good governance and accepted community and ethical standards.

AS/NZS ISO 14001:2016: adhering to legal or other requirement.

Conformity
Fulfilment of a specification or requirement; synonymous with conformance which has been deprecated by ISO.

Conformity Assessment:
Checking that products, materials, services, systems, processes, or people measure up to the specifications of a relevant standard or specification; conformity assessment of management systems involves conducting audits.

Conformity Assessment Body
An accredited body that performs conformity assessment.

Continual Improvement:
Recurring process of enhancing the environmental management system to achieve improvements in overall environmental performance consistent with the organisation's environmental policy.

Control
Process for achieving an objective; also referred to as internal control.

Correction
Action to eliminate a detected nonconformity.

Corrective Action
Action to eliminate the cause of a detected nonconformity in order to avoid recurrence of the nonconformity.

Document
Information and its supporting medium.

Documentation
A set of documents, e.g. procedures and records.

Effectiveness
Extent to which planned activities are realized and planned results achieved.

Efficiency
Relationship between the result achieved and the resources used.

Element
A generic component of an environmental management system required by a clause of the international standard; could also be referred to as a process.

Environment
Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

Environmental Aspect
An element of an organisation's activities, products or services that can interact with the environment.

Environmental Impact
Any change to the environment, whether adverse or beneficial, wholly, or partially resulting from an organisation's environmental aspects.

Environmental Management System
Part of an organisation's management system used to develop and implement its environmental policy and manage its environmental aspects; often abbreviated to *EMS*.

Environmental Noise
Is the summary of noise pollution from outside, caused by transport, industrial and recreational activities. Noise is frequently described as unwanted sound, and within this context environmental noise is generally present in some form in all areas of human activity.

Environmental Objective
Overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.

Environmental Performance
Measurable results of an organisation's management of its environmental aspects.

Environmental Policy
Overall intentions and direction of an organisation related to its environmental performance as formally expressed by top management.

Environmental Target
Detailed performance requirement applicable to the organisation, that arises from the environmental objectives and that needs to be set in order to achieve those objectives.

Evaluation
Systematic determination of merit, worth and significance of something using criteria, e.g. evaluation of effectiveness.

Greenhouse Gases
Gases in the atmosphere that absorb and emit radiation in the thermal infrared range; give rise to the greenhouse effect; water vapour is the most abundant greenhouse gas, followed by carbon dioxide, others are methane, nitrous oxide, various man-made fluorine compounds and ozone; increasing concentration of carbon dioxide due to human activity is believed to be the main contributor to global warming.

Hardstand
This is referred to as an area of land that is sealed by either concrete or bitumen type surfaces.

Hazardous Waste
Solvents, waste acids, alkaline and other corrosive materials, materials containing pesticides, heavy metals, explosives, highly reactive materials.

Initial Environmental Review
A review of environmental aspects of an organisation's activities, products, and services as a basis for establishing an environmental management system.

Internal Audit
Audit conducted by, or on behalf of, an organisation itself for management review and other internal purposes.

Internal Audit Program
Set of one or more internal audits planned for a specific timeframe and directed towards a specific purpose.

ISO
International Organization for Standardisation but abbreviated to ISO (from the Greek *isos* which means *equal*).

JAS-ANZ
Joint Accreditation System of Australia and New Zealand, accredits conformity assessment bodies.

Legal Requirement
Requirement of legislation, a regulation, a licence, a permit, or a contract.

Management Review
Holistic and strategic determination by top management of the suitability, adequacy, and effectiveness of an environmental management system to fulfil commitments made in the environmental policy and achieve the established environmental objectives.

Manual
Document specifying the requirements of an environmental management system.

Nonconformity
Non-fulfilment of a requirement; synonymous with *non-conformance* which has been deprecated by ISO.

Non-Hazardous Waste
Used packaging material, construction material, plastic etc.

Operational Control
Process employed to manage environmental aspects, ensure compliance with legal and other requirements, achieve environmental objectives and targets and consistency with commitments in the environmental policy, or avoid or minimise environmental risks.

Other Requirement
A requirement, not necessarily legally enforced, that an organisation voluntarily subscribes to, e.g. codes of practice, industry or professional associations, support for environmental groups, *AS/NZS ISO 14001:2016*.

Prevention Of Pollution
Use of processes, practices, techniques, materials, products, services, or energy to avoid, reduce or control (separately or in combination) the creation, emission, or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts; can include source reduction or elimination, process, product or service changes, efficient use of resources, material and energy substitution, reuse, recovery, recycling, reclamation and treatment.

Preventive Action
Action to eliminate the cause of a potential nonconformity in order to avoid occurrence of the nonconformity.

Procedure
Specified way to carry out an activity or a process.

Program
A planned set of tasks to achieve environmental objectives and targets, specifying responsibility, means and timeframe; also spelt *programme*; also referred to as *action plan* or *environmental improvement program*.

Process
Set of interrelated or interacting activities which transforms inputs into outputs.

Record
Document stating results achieved or providing evidence of activities performed.

Requirement
Need or expectation that is stated, generally implied or obligatory.

Responsibility
Accountability for something within one's power, control, or management.

Risk
A measure of the likelihood and consequences of an event that will impact on achievement of objectives; can be adverse or beneficial.

Risk Analysis
Systematic process to understand the nature of and to deduce the level of risk; provides the basis for risk evaluation and the treatment of risk.

Risk Assessment
Overall process of identifying risks, risk analysis, and risk evaluation.

Risk Evaluation
Process of comparing the level of risk against risk criteria, e.g. the process used in determining significant environmental aspects.

Risk Management
The culture, processes and structures that are directed towards realising potential opportunities whilst managing adverse effects.

Role
A specific part played by someone in an organisation, usually associated with responsibility, e.g. role of management representative.

Scope
Boundaries of an environmental management system in terms of location, activities, products, and services.

Significant Environmental Aspect
An environmental aspect that has or can have a significant environmental impact in the context of an organisation.

Standard
A set of requirements for a management system, e.g. *AS/NZS ISO 14001:2016*.

Waste
Any discarded material that no long has a useful purpose, and may include solids, liquids, packaging material, containers, etc whether it has an environmental impact or not.

APPENDIX

Procedures

1. WASTE CONTROL

Objective

This procedure is to ensure that waste streams in offices are managed in a way that facilitates recycling.

Responsibilities and Authorities

The Supervisor/Manager are responsible for ensuring the following:

- all employees and contractors, including cleaners, are aware of this procedure,
- appropriate recycling infrastructure is placed around the operation including the office,
- contractors collect the waste at appropriate times,
- co-ordination of monitoring of waste management.

Procedure

- In the office, each waste stream is collected in a separate bin with clear signs and colour coding,
- Adequate bins shall be positioned around the office,
- Site operations to also have waste stream collection bins such as for oily rags, scrap steel, oil etc,
- All wastes containers MUST be labelled clearly,
- Sources of waste should include not only obvious and clearly defined waste generating process operations, but also incidental and non-routine sources. These can include periodic clean-up as a result of leaks or spills, routine programmed maintenance of equipment, process shutdown as well as otherwise unusable products or materials,
- Identify waste minimisation techniques where possible to reduce total waste volume using techniques such as recycle and reuse,
- All wastes removed off site including waste removed for recycling purposes must be tracked. This can be done by filing the invoices for the removal or by using the Waste Despatch Register Form,
- Contractors shall remove waste and deal with it according to contract requirements. Significant contamination of waste for recycling shall be reported to the Supervisor/Manager. Similarly, an occurrence of significant recyclable waste in the general waste bin shall also be reported.

Hazardous Substances

- We will dispose of hazardous substances according to the requirements of legislation and general good practice,
- The need for fire protection and the appropriate fire protection system should be determined by a risk assessment. The “fire protection system” includes fire detection, fire suppression and firefighting equipment, which may be fixed or portable. The risk assessment should take into account the types and quantities of dangerous goods and other material and substances and how they are stored and handled. Additionally, the risk assessment should consider the types and quantities of dangerous goods and other materials and substances in the area and the types of incidents these could potentially cause. The fire protection system should be installed, tested, and maintained in accordance with legislative requirements,
- Ensure spillage controls are in place to prevent or limit environmental contamination, and that ventilation is adequate for storage, handling, and use. This may require a ventilation survey,
- Any atmospheric emissions from dangerous goods that are toxic, corrosive, flammable, explosive or asphyxiate must be eliminated or, if that is not reasonably practicable, reduced so far as is reasonably practicable.

Training and Competency Requirements

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

Example of Office Waste Signs

Forms

- Appendix Form 1.1 Waste Despatch Register

Appendix Form 1.1 Waste Despatch Register

Date	Waste Description	Volume Dispatched (litres or Kg)	Name of Carrier	Receival Destination	Initials and Signature of Carrier

2. ENERGY CONSUMPTION

Objective

DGL Group are committed to promoting energy efficiency and conservation to benefit the environment, employees, and the community. Beyond reducing utility bills, careful energy management helps protect the environment and extends the life of equipment while also maintaining a comfortable setting in which to work.

DGL Group requires support and participation from management and employees. To be successful, we will require our employees to change their behaviour in ways that promote energy savings, including turning off lights and computers after normal hours.

Responsibilities and Authorities

- All employees and management are responsible to follow the measures outlined in the procedure.
- Management are responsible for implementing and monitoring strategies to reduce energy consumption,
- Supervisors are responsible to ensure employees are informed and adhere to these strategies, and where changes are made, such changes are communicated to employees,
- Employees are responsible for adhering to strategies in place to assist in energy consumption.

Procedure

- Lighting is to be switched off when a room is not in use,
- When new equipment is purchased, the energy rating is to be taken into consideration, and it should have a “standby/power saver mode”,
- Computers are to be switched off prior to employees leaving for the day. The last person to leave each day is responsible to ensure all computers and lights have been turned off,
- Where possible, equipment not in use is to be switched off, rather than in standby mode,
- When purchasing equipment, energy efficiency to be considered.

Training and Competency Requirements

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

3. ENVIRONMENTAL NOISE

Objective

DGL Group is committed to ensure that environmental noise is managed by controlling noise and vibration from vehicles, road construction, road maintenance activities, plant, power tools and activities/equipment that can cause loud noise on site.

Responsibilities and Authorities

- All employees and management are responsible to follow the measures outlined in the procedure,
- Management are responsible for implementing and monitoring strategies to reduce noise,
- Supervisors are responsible to ensure employees are informed and adhere to these strategies, and where changes are made, such changes are communicated to employees,
- Employees are responsible for adhering to strategies in place to reduce noise.

Procedure

- Enforce vehicle standards such as speed limits on site and driver education,
- Manage the road traffic noise impacts at the operation to keep environmental noise to a minimum,

- New Plant/equipment that is purchased, noise emission data to be assessed prior to purchase. Existing plant/equipment to be assessed by noise specialist and if an issue exists apply noise reduction devices if available,
- Manage responses to noise and vibration complaints,
- Conduct Noise and vibration risk assessment,
- If environmental noise complaints have been received by neighbours, consider conducting a boundary noise survey.

Engineering Noise Control Measures

- Eliminate or replace the machine or its operation by a quieter machine or operation with equal or better efficiency,
- Replace noisy machinery by installing newer equipment designed for operating at lower noise levels. Machinery sources and transmissions can be designed to give quiet speed regulation. Vibration sources can be isolated and treated within the machine. Cover panels and inspection hatches on machines should be stiff and well damped. Cooling fins can be designed to reduce the need for forced airflow and hence fan noise,
- Correct the specific noise source by minor design changes. For example, avoid metal-to- metal contact by the use of plastic or rubber gaskets and buffers, or replace noisy drives with quieter types or use improved gears,
- A high standard of equipment maintenance should be provided. Badly worn bearings and gears, poor lubrication, loose parts, slapping belts, unbalanced rotating parts and air leaks all create noise which can be reduced by good maintenance. Plant and equipment resulting in excessive noise levels should be repaired immediately,
- Correct the specific machine elements creating noise by a local source approach, rather than by consideration of the entire machine as a noise source. For example, the addition of noise barriers, noise enclosures, vibration isolation mountings, lagging to dampen vibrating surfaces, mufflers or silencers for air and gas flows or reducing air velocity of free jets. These may be considered as a solution for the individual noise producing elements of the total operation,
- Separate the noisy elements that need not be an integral part of the basic machine. For example, move pumps, fans, compressors that service the basic machine,
- Isolate the vibrating machine parts to reduce noise from vibrating panels and guards,
- In addition to engineering changes to machinery and parts, processes can be modified to reduce noise. Specific means of modification include the use of processes that are inherently quieter than alternatives, for example, chemical demolition rather than jack hammering.

Engineering Treatment of the Noise Transmission Path

If it is not possible to change or modify the noise generating equipment or processes by engineering treatment of the source, engineering treatment of the noise transmission path between the source and the listeners (employees, public, and customers) should be investigated.

Engineering of the noise transmission path includes isolating the noise emitting object(s) in an enclosure or placing them in a room or building away from the largest number of listeners, and acoustically treating the area to reduce noise to the lowest practicable levels.

The principles to be observed in carrying out engineering treatment of the noise transmission path are as follows:

- Distance is often the cheapest solution, but it may not be effective in reverberant conditions,
- Erect a noise barrier between the noise source and the listener, in some instances a partial barrier can be used to advantage. In cases where either area has a false ceiling, care should be taken to ensure that the dividing wall extends to the true ceiling and that all air gaps in the wall are closed and airtight,

- Once the acoustical barrier is erected, further treatment, such as the addition of absorbing material on surfaces facing the noise source may be necessary,
- Materials that are good noise barriers, for example, lead, steel, brick, and concrete are poor absorbers of sound. The denser and heavier the material, the better the noise barrier,
- Good sound absorbers, for example, certain polyurethane foams, fibreglass, rock wool and thick pile carpet, are very poor barriers to the transmission of sound,
- Walls and enclosures must be designed to minimise resonances, which will transmit acoustical energy at the resonant frequency to the protected area. Placing reinforcement or bracing in strategic areas can achieve this during construction or modification,
- Reduce as far as possible, the reverberation of the room where the noise is generated by the introduction of acoustically absorbent material(s). The presence of reverberation in a room shows the need for absorbing material. Excessive reverberation produces unpleasant and noisy conditions that can interfere with speech communication.

Training and Competencies

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

4. DUST

Objective

DGL Group is committed to ensure that dust is managed at the operation.

Responsibilities and Authorities

- All employees and management are responsible to follow the measures outlined in the procedure,
- Management are responsible for implementing and monitoring strategies to reduce dust,
- Supervisors are responsible to ensure employees are informed and adhere to these strategies, and where changes are made, such changes are communicated to employees,
- Employees are responsible for adhering to strategies in place to reduce dust.

Procedure

- Enforce vehicle standards such as speed limits on site,
- Manage the road traffic at the operation to keep dust a minimum,
- Manage responses to dust complaints,
- Conduct dust risk assessment,
- If dust complaints have been received by neighbours, consider conducting a boundary dust survey,
- In times of extremely dusty situations hire a water truck to wet down the operation.

Training and Competencies

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

5. WATER POLLUTION

Objective

- **To reduce the impact DGL Group's business activities have on water pollution,**
- **The target for all Projects is, as a minimum, to comply with the relevant regulations for specific water bodies. Through compliance with regulations, environment protection will be achieved,**
- **Clients may also impose discharge limits for various indicator contaminants,**
- **To keep all waste and products associated with the works undertaken out of the drains and waterways.**

Responsibilities and Authorities

- All employees and management are responsible to follow the measures outlined in the procedure,
- Management are responsible for implementing and monitoring strategies to reduce water pollution,
- Supervisors are responsible to ensure employees are informed and adhere to these strategies, and where changes are made, such changes are communicated to employees,
- Employees are responsible for adhering to strategies in place to reduce water pollution.

Procedure

- Assess the existing features of the land including the contour, existing vegetation, stormwater drains and drainage pattern, proximity to waterways, soil type,
- Program works, where possible, to minimise the impact on the environment,
- Define where risk activities are going to take place,
- Where relevant, install soil erosion and sediment control measures prior to the commencement of works (if possible). Site activities and changes over time will/may necessitate re-assessment of control measures during works,
- Assess the possibility of installing cut off drains to divert clean storm water around the site,
- Program work to limit the extent and duration of exposed earth. This may reduce the number of erosion and sediment control structures required across the site,
- Retain vegetation where possible as it minimises exposed surfaces and assists in treating runoff,
- Stockpiles or areas that will be exposed for longer than 3 months will be hydro seeded or mulched to reduce erosion potential. Silt fencing may also be required up gradient and / or down gradient of stockpiles,
- Stockpiles will not be located near drainage lines or waterways,
- Access on site will be limited to designated areas,
- Minimise soil erosion by compacting and trimming all fill surfaces prior to any chance of rain. Roughening the surface (e.g. using a machine on tracks) on steep batters will reduce flow velocities thus limiting erosion. At the end of each day would be practical. Where possible, progressive treatment should be conducted on site rather than concentrating control devices in one location,
- Protect areas of concentrated water flow by leaving / using existing topsoil with vegetation or installing protective matting or fabric,
- Run off from disturbed areas must be filtered prior to discharge to stormwater or waterways. Sediment control devices should be located up gradient of sensitive areas such as creeks, steep embankments, and storm water inlets. Filtration may be in the form of silt fencing, sediment traps, gravel bags, settling ponds etc. All sediment control structures need to be adequate in size to cope with the amount of water anticipated and regularly maintained. Note that offline sedimentation basins are preferred to in stream sedimentation basins,
- Water from sediment ponds can be used to irrigate vegetated areas remote from waterways or alternatively be used for dust control,
- Servicing of machinery/equipment should be undertaken in a controlled manner. An area should be designated for such activities which is located away from storm water, waterways, and sensitive

vegetation. Sealed containers should be available for waste materials. Waste should be disposed of off-site in accordance with the Waste Control Procedure,

- Ensure wash down and fuel storage areas are located away from storm water drainage lines and waterways. Fuel and chemicals should be stored in accordance with relevant standards/guidelines (Refer to Storage, Handling & Decanting of Hazardous Substances),
- Where utilised, bitumen, concrete and concrete slurry needs to be controlled to prevent it from entering the storm water system. Storm water drains need to be protected and spill kits or suitable materials should be available on site to respond to a spill immediately,
- Water being pumped or emptied from dams needs to be filtered / treated prior to discharge to ensure water quality limits are being met,
- A detailed check of the site history and the likelihood of soil contamination should be completed such that the stockpiling of material with leachable contaminant levels is prevented (adjacent waterways),
- Water which appears contaminated (may have odour or discolouration) should not be pumped until it has been tested and found to meet EPA criteria,
- Vegetation to remain on site will be handled in accordance with the Flora and Fauna Procedure,
- Alternative methods of construction may need to be assessed when working in, adjacent to or over waterways, to minimise the impact on the environment,
- Dirt/mud should not be washed from roads unless adequate control measures are in place to prevent sediment from entering the storm water system. Washing roads with no controls in place is poor practice and likely to result in pollution.

Training and Competencies

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

6. HOUSKEEPING

Objective

This procedure is to ensure that housekeeping standards are adhered to.

Responsibilities and Authorities

The EMS Coordinator is responsible for ensuring the following:

- all employees and contractors, including cleaners, are aware of this procedure,
- co-ordination of monitoring of housekeeping practices.

Procedure

Housekeeping

- Before you start the job,
- During the job and,
- On completion of the job.

Daily housekeeping – All personnel

- All spills cleaned up as soon as practical,
- All rubbish removed to appropriate containers,
- All tools and equipment stored in designated positions after use,
- Check fuel bund cleanliness and capacity during rainfall (if applicable).

Weekly housekeeping – Coordinators

- All equipment is cleaned and stored appropriately,
- All tools, spares and equipment stored appropriately,
- Ensure all oily waste is disposed of in waste collection drum to be recycled,
- All spills to be cleaned up immediately.

Training and Competency Requirements

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

7. SPILL MANAGEMENT

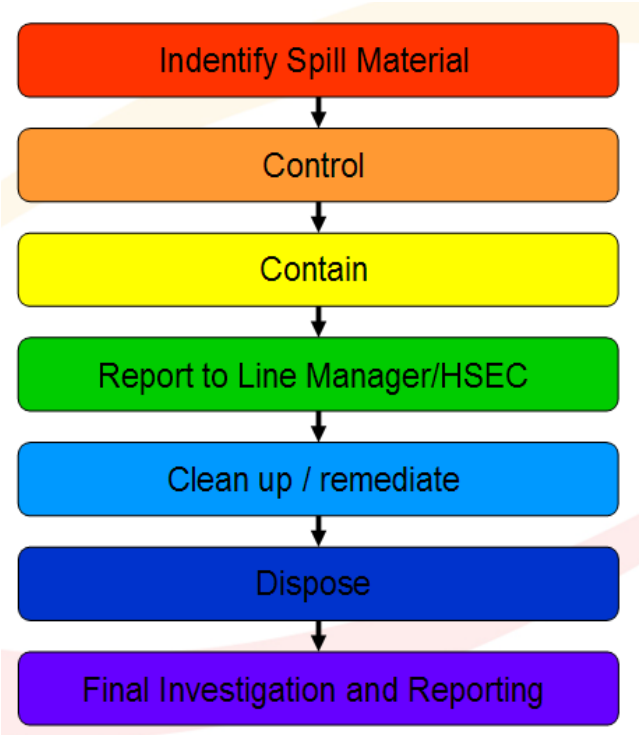
Objective

This procedure is to ensure that spill management practices are adhered to. Responsibilities and Authorities

The Supervisor/Manager is responsible for ensuring the following:

- **all employees and contractors, including cleaners, are aware of this procedure,**
- **co-ordination of monitoring of spill management practices.**

Procedure



Identify Spill Material

- Identify the spill material,
- If it cannot be identified, supervisor to call the Emergency Services,
- Do not go near the spill if a positive identification cannot be made,
- NOTE: If spill is going to flow into a drain, watercourse or into a public area, THE SPILL SHOULD BE CONTROLLED AND CONTAINED IF THIS CAN BE DONE SAFELY,
- Refer to Safety Data Sheet (SDS) for information including precautions required, PPE, health effects, spill clean-up and disposal,
- Isolate the area to keep personnel away.

Control

- Item spilt – try and control by plugging hole, tilting item, turning off valves etc,
- If possible, decant spill material from the damaged drum/tank/pipe/bag into another container/bund. If unable to decant to container or bund, ensure decant is in a contained area,
- Place a container under the spill to capture spill material,
- Where control of the leak is not possible, ensure the spill continues to be contained,

Contain

- Use material available in the area of the spill to block its path to drains, watercourses, or public areas. This may include dirt, sand, or other absorbent material,
- For liquid spills use specialised spill containment materials where available. They can be in the form of booms, socks, pillows, and pads and should be placed in front of the flow of the spill and around the spill, if possible,
- Any extra absorbent material should be placed on the spilled material to soak it up,
- Granular spills may be covered with a waterproof tarpaulin to prevent wind borne and water borne particulates. If necessary, conduct an earthen bund around site to prevent stormwater moving towards and through spill,
- Consider if the stormwater isolation valves should be closed to contain spill on site.

Report to Supervisor

- Once the spill is identified, controlled, and contained report the spill to your Supervisor,
- Once the spill is identified, controlled, and contained record as an incident in your reporting system as a site loss of containment,
- Assess the nature of the spill with regard to the significance of environmental harm and compliance with regulatory authority requirements. If significant environmental harm is caused or non-compliance with environmental Licence conditions report to the regulatory authority.

Clean up/remediate

- NOTE: DO NOT use water to clean up spills,
- All waste generated during clean up shall be disposed of in an appropriate manner,
- Clean up, recover, and return spilled material to container or shed, if possible,
- Soak up spilt liquids using absorbent materials and place waste materials in a drum or strong bag,
- Treat any contaminated water until it achieves acceptable limits.

Dispose

- NOTE: Ensure engagement with your Supervisor prior to disposal of waste materials or contaminated soil/water,
- Contaminated materials must only be disposed at facilities licensed to accept that waste,
- Engage with your Supervisor on suitability of reuse of spilt material.

Final investigation and Reporting

- Spills and contamination are to be reported as site loss of containment,
- Where indicated by a risk assessment, an Incident Investigation Report must be completed.

Training and Competency Requirements

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

8. FUEL STORAGE

Objective

This procedure is to ensure that fuel storage facilities are operated in a manner compliant with the policy.

Note this procedure does not apply for Fuel Service Stations.

Responsibilities and Authorities

Supervisors/Managers are to ensure the following:

- all employees and contractors are aware of this procedure,
- regular checks are completed as per procedure.

Procedure

Bunding and Containment

- Bunding is mandatory. This can be in the form of either fixed or temporary bunding such as pallet bunds,
- Fuel storage facilities shall be located so as to avoid soil or water contamination in the event of a loss of containment (i.e. in a level location, clear of creeks, drains etc). At least 15m from fence lines and creeks where both flammable and combustible liquids are storage or 3m from combustible liquids,
- Bund capacity for large tanks shall be at least 110% of total stored volume,
- Bund capacity for pallet bunds shall be 110% of the largest container stored on the pallet bund,
- Bunds shall be constructed from cement or equivalent impervious material. If bunds are constructed with bessor block these must be lined,
- A collection sump shall be provided in the bund floor to facilitate the removal of liquids where possible,
- Bund valves are to be placed on outside of the bund wall. All bund valves shall be padlocked shut,
- Bund valves and bund integrity shall be checked annually,
- Refer to AS 1940-2004 the storage and handling of flammable and combustible liquids for further information.

Fuel Transfer

- Ensure bund valves are closed prior to commencing any fuel transfer,
- Fuel transfer areas shall be cement bunded areas where possible.

Fuel storage and Management

- Ensure that all valves, hoses, and vessels have integrity checks at least once per annum to identify leas or fatigue,
- Weekly visual inspections is also required at time of housekeeping inspection,
- Each day the bund shall be inspected. If water is present, check for oil or diesel film on surface (hydrocarbon slick), if not release bund valve and discharge water onsite. If slick is present, use hydrocarbon absorbent which encapsulates oil from water surface. Skim off absorbent once hydrocarbons have been absorbed (<30mins), place absorbent/hydrocarbon in a labelled sealed container, release water from bund,
- Ensure Safety Data Sheets (SDS) are available for products stored and used in this area.

Site Housekeeping

- Ensure the facility is kept clean and tidy at all times,
- Clean up and remove any surface spills or staining immediately,
- Ensure bund valves for above ground tank bunds are kept CLOSED at all times,

Monitoring

- Inspect bunds and fuel transfer points daily,
- Clean up any slicks of oil/diesel/fuel using materials detailed in the Spill Control Procedure and discharge remaining water,
- Conduct regular inventory checks of fuel levels in storage thanks and maintain Fuel Log Sheet.

Training and Competency Requirements

This procedure shall be included in inductions for new employees, and new contractors who are expected to work at DGL Group for more than two days.

Forms

- Form 11.1 Fuel Log Sheet,

Appendix Form 11.1 Fuel Log Sheet

Tank Description: _____

Type of Fuel: _____

Date	Opening Stock Level (Litres)	Fuel Delivery Volumes (Litres)	Metered Fuel Used Since Last Check (Litres)	Balance (Litres)	Dip Level (Litres)	Variations in Inventory Levels (Litres)	Cumulative Variation (Litres)	Comments on Variation	Action Taken	Initials (Person Taking Dipping Records)

9. POLLUTION INCIDENTS

Objective

This procedure is to ensure that Pollution incidents causing or threatening material harm to the environment are notified.

Definitions

Pollution incident - means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.

Responsibilities and Authorities

The Supervisor/Manager are responsible for ensuring the following:

- all employees and contractors, including cleaners, are aware of this procedure,
- All Pollution incidents are notified in accordance with legislative requirements,
- Ensure Environmental Licence Conditions are adhered to.

Procedure

In most cases, concerns about pollution should be referred to the source or person causing the problem. The procedure on this page should be used when an approach to the person causing the problem has not been or is unlikely to be successful.

Pollution incidents that cause or threaten material harm to the environment will be notified to each of the following authorities:

- the appropriate regulatory authority (ARA),
- the Environment Protection Authority (EPA) if they are not the ARA,
- the Ministry of Health,
- SafeWork NSW (formerly WorkCover),
- the local authority, e.g. the local council, if this is not the ARA,
- Fire and Rescue NSW.

All pollution incidents causing or threatening material harm to the environment will be notified.

A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur.

'Material harm to the environment' includes on-site harm, as well as harm to the environment beyond the premises where the pollution incident occurred.

Notification Procedure

Firstly, call 000 if the incident presents an immediate threat to human health or property. Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, as they are responsible for controlling and containing incidents.

If the incident does not require an initial combat agency, or once the 000 call has been made, DGL Group will notify the relevant authorities in the following order.

- the appropriate regulatory authority (ARA) for the activity under the POEO Act (usually the EPA or local authority) – the local authority is a local council of an area under the Local Government Act 1993), the Lord Howe Island Board for Lord Howe Island, or the Western Lands Commissioner for the Western Division (except any part of the Western Division within the area of a local council),

- the EPA, if it is not the ARA – phone Environment Line on 131 555,
- the Ministry of Health via the local Public Health Unit – see link,
- SafeWork NSW (formerly WorkCover) – phone 13 10 50 the local authority if this is not the ARA,
- Fire and Rescue NSW – phone 1300 729 579.

Note: If the situation warranted calling 000 as a first point of notification, it is not required to ring Fire and Rescue NSW again.

Incidents that do not cause or threaten material harm to the environment

If DGL Group becomes aware of an incident that does not pose a risk of material harm to the environment, we will report that incident to the organisation responsible for regulating pollution from that activity. Organisation responsibility can be located at the relevant link

- Water Air Noise Waste & Litter Chemical & Radiation Other

Environment Line

If DGL Group is required to report any of the types of pollution for which the Environment Protection Authority (EPA) has regulatory responsibility, we will phone 131 555 or

(02) 9995 5555 (if calling from outside NSW).

Emergencies

If adequate resources are not available to contain material released in a pollution incident and it threatens public health, property or the environment, Fire and Rescue NSW, NSW Police, and the NSW Ambulance Service (000) will be contacted for emergency assistance.

10. AIR EMISSIONS

Objective

DGL Group is committed to ensure that Air Emissions are managed through air quality auditing and monitoring of emissions and comparing against current environmental legislation, guidelines, and standards.

Responsibilities and Authorities

- All employees and management are responsible to follow the measures outlined in the procedure,
- Management are responsible for implementing and monitoring strategies to reduce Air Emissions,
- Supervisors are responsible to ensure employees are informed and adhere to these strategies, and where changes are made, such changes are communicated to employees,
- Employees are responsible for adhering to strategies in place to reduce Air Emissions,
- Attend environmental and occupational health and safety management training seminars.

Procedure

The following strategies should be employed to control emissions to the atmosphere.

Elimination of emissions

Where possible, chemicals and equipment causing emissions will be replaced. Where practicable DGL Group will ensure the products and equipment which produce the least emissions are used.

Fuel Change

A more efficient combustion can be achieved by using various fuels. For example, high sulphuric fuels such as coal and oil may be replaced with gas. This may be done in conjunction with improving technology.

Buffer Zones

Buffer zones are environmental management planning tools intended to protect sensitive areas from negative environmental impacts. Chemicals with fumes will be vented appropriately and buffer zones set up where practicable.

Ecologically Sustainable Principles

Ecologically sustainable principles aim at allowing development and activities whilst conserving resources such that the ecological processes and environment, are maintained to meet the needs of future generations. Where practicable, DGL Group will use ecologically sustainable principles.

Efficiency of Resource Use

Fuel (including electricity) can be saved by commissioning of new technology for heating, cooling, and power generation.

Monitoring

Monitoring programs will be undertaken when required.

Records

All documents issued regarding air quality and emissions are to be kept for 7 years.

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