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NORTHEAST BUSINESS PARK

Waste Management Technical Report

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Northeast Business Park Pty Ltd

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NORTHEAST BUSINESS PARK

WASTE MANAGEMENT TECHNICAL REPORT

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TERMINOLOGY

AHD	Australian Height Datum
AS	Australian Standard
ASS	Acid Sulphate Soils
ASSMP	Acid Sulphate Soils Management Plan, prepared by Cardno dated 19 October 2007.
CEMP	Construction Environmental Management Plan, prepared by Cardno.
Consultant	The civil and/or environmental engineering consultant employed by the Proponent.
Contractor	The party or company performing construction works relating to the proposed development and includes all employees of the Contractor and sub-contractors.
CSC	Caboolture Shire Council
Development	Development of 769 hectares with the following components: • Mixed Industry Business Areas; • Marina; • Marine industry; • Shipyard; • Marina Village. • Marina Residential; • Marina Pavilion; • Hotels; • Golf club and golf course; • Golf Residential. • Residential • Environmental open space; • Recreational areas and sporting fields; • Heritage park; • Environmental Centre; • Community Nodes; and • Educational and Training Facility.
EP	Equivalent Person
EPA	Environmental Protection Agency
EP Act	*Environmental Protection Act 1994*
EPP Waste	*Environmental Protection (Waste Management) Policy 2000*
ERA	Environmentally Relevant Activity.

General waste	The *Environmental Protection Regulation 1998* defines "general waste" as waste other than regulated waste. Schedule 7 of this Regulation lists substances and materials regarded as regulated wastes.
NEBP	Northeast Business Park
MIBA	Mixed Industry Business Areas
Operator	Northeast Business Park Pty Ltd or another company set up to undertake those works which are not required to be undertaken by Council to operate and maintain the completed development.
Proponent	Northeast Business Park Pty Ltd. A Queensland registered company with shares held by the shareholders of Port Binnli Pty Ltd, Laing O'Rourke Caboolture Developments Pty Ltd and a number of smaller shareholders.
SBMP	Site Based Management Plan (Marina), prepared by Cardno.
Site	769 hectares of property which includes the following seven parcels of land: 1. Lot 2 on RP902075; 2. Lot 10 on RP902079; 3. Lot 24 on SP158298; 4. Lot 7 on RP845326; 5. Lot 15 on RP902073; 6. Lot 12 on RP145197; and 7. Lot 17 on RP902072.
Waste	Waste is defined as "any gas, liquid, solid or energy or a combination of wastes that is surplus to, or unwanted from, any industrial, commercial, domestic or other activity, whether or not of value".
WMP	Waste Management Plan
WMTR	Waste Management Technical Report

EXECUTIVE SUMMARY

Northeast Business Park Pty Ltd proposes to develop 769 hectares of land situated on the southern bank of the Caboolture River approximately 8km inland from the coastline, adjacent to the Bruce Highway and 43km north of Brisbane CBD, the NEBP site includes the following seven land parcels (the "site").

- Lot 2 on RP902075
- Lot 10 on RP902079
- Lot 24 on SP158298
- Lot 7 on RP845326
- Lot 15 on RP902073
- Lot 12 on RP145197
- Lot 17 on RP902072

Due to the location of the site on the Caboolture River, adjacent to the Moreton Bay Marine Park area and Deception Bay Fish Habitat area, it is important that the development not adversely impact the receiving environment.

The development comprises of the following components, which will be built in stages, with an anticipated completion date of approximately 2020.

- Mixed Industry Business Areas;
- Marina;
- Marine industry;
- Shipyard;
- Marina Village.
- Marina Residential;
- Marina Pavilion;
- Hotels;
- Golf club and golf course;
- Golf Residential.
- Residential
- Environmental open space;
- Recreational areas and sporting fields;
- Heritage park;
- Environmental Centre;
- Community Nodes; and
- Educational and Training Facility

The development will be conducted in stages and will allow final population levels to be achieved over a 10-12 year period. Due to the development being completed in stages, it is likely that construction wastes will be generated concurrently with operational wastes.

Waste management mitigation measures have been proposed for the development. The mitigation measures will ensure that waste generated from the development will be managed in accordance with the 'National Waste Minimisation and Recycling Strategy' and in particular the *Environmental Protection (Waste Management) Policy 2000* (Waste EPP) in respect of the waste management hierarchy. The waste management hierarchy is as follows, in order of preference:

a) waste avoidance;
b) waste reuse;
c) waste reduction;
d) waste recycling;
e) cleaner production and/or energy recovery; and
f) waste disposal.

The waste management hierarchy and minimisation of environmental impacts will be considered during design, construction and operation of the development. A Waste Management Plan has also been developed and is included in this report.

1. INTRODUCTION

This report outlines the waste management strategies recommended for the proposed Northeast Business Park development by Northeast Business Park Pty Ltd (the Proponent). The report identifies opportunities for waste minimisation and addresses waste disposal options, waste storage, collection and transport.

The purpose of this Waste Management Technical Report (WMTR) is to ensure that development on the site does not adversely impact areas adjacent to the site in terms of waste handling, storage and disposal. Due to the site's location adjacent to the Caboolture River and Moreton Bay Marine Park it is essential that development is conducted in a sensitive manner causing no adverse impact to the surrounding environments.

1.1 Site Description

The NEBP development will be located on the southern bank of the Caboolture River approximately 8km inland from the coastline, adjacent to the Bruce Highway and 43km north of Brisbane CBD, the NEBP site encompasses 769 hectares of property which includes the following seven land parcels (the "site").

1. Lot 2 on RP902075
2. Lot 10 on RP902079
3. Lot 24 on SP158298
4. Lot 7 on RP845326
5. Lot 15 on RP902073
6. Lot 12 on RP145197
7. Lot 17 on RP902072

A site locality plan is provided as Figure 1.

The NEBP site is currently vacant privately owned used for cattle grazing. The majority of the site previously supported exotic pine plantations and was utilised for forestry purposes, however it does contain some areas of ecological value, including remnant terrestrial vegetation, marine vegetation, Caboolture River frontage and tidal creeks.

The site is bound to the north by 9km of Caboolture River frontage, with land on the opposite side of the river being primarily rural and used for forestry activity; to the west by the Bruce Highway, with land on the opposite side of Bruce Highway developed with residential and open space areas; and to the south and east by privately owned rural residential properties with lot sizes ranging from 1-20 ha, bushland, open grassland areas and limited agricultural and recreational land uses.

The site is surrounded by areas of conservation significance as follows.

- The Deception Bay Declared Fish Habitat area, which extends along the entire length of the northern boundary, within the bounds of the Caboolture River. This area is protected by the *Fisheries Act 1995* due to the estuarine habitats that support commercial and recreational fisheries in close proximity to developing communities.
- The Habitat Protection Zone of the Moreton Bay Marine Park which is located within the Caboolture River and begins at the northern boundary of the site then extends eastward along the Caboolture River. This area is protected by the *Marine Parks Act 2004* in order to:
    - conserve significant habitats, cultural heritage and amenity values of the marine park;

  - maintain the productivity and diversity of the ecological communities that occur within the marine park; and
  - provide for reasonable public use and enjoyment of the zone consistent with the conservation of the marine park.

- The Moreton Bay RAMSAR wetlands which traverse the area within the Caboolture River as the Moreton Bay Marine Park and extends to the boundary of Lot 10. The Moreton Bay RAMSAR wetlands are protected pursuant to international conventions as they are one of only three extensive intertidal areas of seagrass, mangroves and saltmarsh on the eastern coast of Australia that provide habitat for water birds.
- South East Queensland Wader Bird Sites are mapped approximately 500m to the east of the site. This area is protected via the JAMBA and CAMBA convention to protect habitats of Migratory Birds.

1.2 Project Description

Northeast Business Park (NEBP) is a multi-use business park and marina concept that will integrate marina facilities, appropriate business, residential, heritage and recreational greenspace precincts providing a place to live, to work and to play in a master planned riverside precinct on the Caboolture River.

The following components are incorporated into the NEBP development.

- Mixed Industry Business Areas (MIBA);
- Marina;
- Marine industry;
- Shipyard;
- Marina Village.
- Marina Residential;
- Marina Pavilion;
- Hotels;
- Golf club and golf course;
- Golf Residential.
- Residential
- Environmental open space;
- Recreational areas and sporting fields;
- Heritage park;
- Environmental Centre;
- Community Nodes; and
- Educational and Training Facility

A copy of the proposed development plan is provided in Figure 2.

Of the 769 hectares, 45% (350 ha) will be developed. The remaining area (413 ha) will be set aside for open space, and active and passive recreational uses, including a heritage park.

The development provides an integrated mixed-used business park and marina precinct which combines land uses making the development more viable and sustainable. The NEBP will be capable of attracting local, national and international businesses, incorporating clusters of mixed and complementary industry and businesses, underpinned by a high quality residential development, and a state of the art marina and marine industries precinct.

The development will provide an important community and business focus for Caboolture and help to address a significant undersupply of marine facilities and associated uses. There is an identified lack of marina berths within Queensland, Southeast Queensland and particularly the immediate area.

Supporting infrastructure, such as wastewater, electricity, telecommunications and roads, associated with the NEBP development will require upgrading and in some cases extensions to existing infrastructure will be necessary. Proposed improvements to infrastructure include additional sewerage and electricity provisions to be incorporated into NEBP and internal roads through the development to service industrial and commercial precincts.

2. WASTE MANAGEMENT STRATEGIES

2.1 Legislative Requirements

2.1.1 Environmental Protection Act 1994

The Queensland *Environmental Protection Act 1994* (EP Act), administered by the Queensland Environmental Protection Agency (EPA), was established to protect the environment while allowing development that improves the total quality of life, now and in the future, in a way that maintains the ecological processes on which life depends, often referred to as 'ecologically sustainable development'.

The EP Act utilises a number of mechanisms to achieve its objectives, these include:

- granting of development permits for material change of use in relation to Environmentally Relevant Activities (ERAs);
- licensing or approving ERAs;
- issuing Environmental Protection Policies (EPPs);
- regulations; and
- creating a general environmental duty. Section 319 of the EP Act establishes a duty for a person to take all reasonable and practicable measures to prevent or minimise environmental harm when carrying out an activity.

2.1.2 Environmental Protection (Waste Management) Regulation 2000

The regulatory requirements concerning waste management are provided within the within the EP Act and *Environmental Protection Regulation 1998*, but more specifically the *Environmental Protection (Waste Management) Regulation 2000*.

The regulation provides provision for the following:

- offences for littering, waste dumping, unlawful disposal of hypodermic needles and unlawful activities at waste facilities;
- a waste tracking system that collects data on waste generation, transportation and disposal within Queensland and interstate;
- a procedure for approval of wastes for beneficial reuse;
- approval processes for beneficial use of wastes; and
- design rules for waste equipment.

2.1.3 Environmental Protection (Waste Management) Policy 2000

The *Environmental Protection (Waste Management) Policy 2000* (Waste EPP) outlines the waste hierarchy which moves from the most preferred — waste avoidance, to reuse, recycling, and energy recovery, through to waste disposal, the least preferred.

The three main principles of the Waste EPP are:

1. The "polluter pays principle" — all costs associated with waste management should, where possible, be borne by the waste generator.

2. The "user pays principle" — all costs associated with the use of a resource should, where possible, be included in the price of goods and services developed from that resource.
3. "Product stewardship principle" — the producer or importer of a product should take all reasonable steps to minimise environmental harm from the production, use and disposal of the product.

The EPP Waste and the *Environmental Protection (Waste Management) Regulation 2000* are the primary legislative instruments governing waste management in Queensland.

The EPP Waste provides for the preparation of waste management programmes to minimise waste generation, promote the efficient use of non-renewable resources and promote the use of waste as a resource in order to achieve the objectives of the *Environment Protection Act 1994*. The EPP Waste outlines a hierarchy of waste management to be adopted in preparing waste management programs. This hierarchy lists waste management practices in the preferred order of adoption. These include waste avoidance as a first option, then reuse, recycling and energy recovery with waste disposal as a last option.

2.2 Other Requirements

Other documents which have been considered in the preparation of this report are as follows.

- National Waste Minimisation and Recycling Strategy (CEPA, 1992);
- South East Queensland (SEQ) Regional Plan waste policies (Queensland Office of Urban Management (OUM), 2006).
- Waste Management Strategy for Queensland, (Queensland Environmental Protection Agency (EPA), 1996).
- Wastewise Construction Program; Waste Reduction Guidelines (National Heritage Trust, 2000).
- Best Practice Guidelines for Waste Reception Facilities at Ports, Marina and Boat Harbours in Australia and New Zealand (ANZECC et.al.).
- Eco-Industrial Park Handbook for Asian Developing Countries (Indigo Development, 2001).

2.3 Waste Management Hierarchy

NEBP will utilise the waste management hierarchy to guide design and implementation choices in all phases of the project development and operation. Some measures will apply across the hierarchy, such as:

- Design of site development, infrastructure, and guidelines for buildings.
- Training in construction environmental best practices for construction contractors and their employees.
- Environmental best practices for commercial and industrial firms, the marina, golf course, and other precincts.
- Covenants, restrictions, and regulations placed upon the different precincts.

2.3.1 Waste Avoidance

Waste avoidance may be achieved by preventing or reducing the amount of waste generated by an activity through process or product redesign or substitution of raw materials. In NEBP development and operations waste avoidance and minimization practices will include:

- Waste avoidance measures and sustainable building principles will be incorporated in to the design of the development.
- Design principles will seek efficient use of all resources in the development process and in the lifecycle of the buildings and infrastructure.
- Efficient use of non-renewable resources including improved equipment use.
- Accurate estimation of raw material quantities to avoid excessive unused materials requiring disposal.
- Selection of materials on the basis of waste minimisation (quantity of packaging etc).
- Installation of resource efficient appliances and fittings to reduce operational waste.
- Alternatives to plastic bags will be provided at retail outlets.

Waste avoidance provides the greatest opportunity for limiting waste during construction and operation of the development.

2.3.2 Waste Reduction

Waste reduction will be implemented during design, construction and operation. Opportunities for waste reduction through the design of the buildings and construction best practices will include the following measures.

- Project management control during construction.
- Management of estimating and ordering, such as material ordering, delivery, placement and tracking of materials.
- Implementation of supplier and service provider contracts which focus on environmental performance, such as “just in time” ordering of construction materials and supplies, reduction in packaging materials.
- Reducing toxic materials risks through material substitution.
- Retention of vegetation, when feasible, during design and construction.

2.3.3 Waste Reuse

Waste reuse refers to the further use of waste products without further processing. The promotion of multi-use containers and pallets are examples of resource conservation measures. Such measures may include the following.

- The reuse of material containers.
- Purchase in bulk to avoid individual packaging.
- Promotion of the use of container return programs such as the delivery of materials on crates that are then returned to the manufacturer for reuse.

- Mulching of vegetation and other organic waste to be reused as landscaping material on the site.

2.3.4 Waste Recycling

Waste recycling refers to the reprocessing of waste materials to produce new products. Materials should be selected on the basis of recyclability including end-of-life recyclability. Opportunities for waste recycling may include the following measures.

- Materials salvaged and reused where possible.
- Purchasing recyclable or recycled materials.
- Separation and collection of recyclable materials.

All wastes unable to be reused on site will be transferred to the Transfer Station at the Caboolture landfill on McNaught Road, Caboolture where they will be sorted into re-usable, recyclable and waste disposal streams. The Caboolture landfill also has a “Recycling Shop”.

There are options for recycling of waste stream elements at the development during construction. There is the potential for reuse or re-milling of timber materials collected from construction sites. Timber may also be reused onsite or chipped for use in landscaping.

Operators of the development may encourage waste reuse and recycling through provision of waste separation facilities and collection of recyclable materials. This element of the waste hierarchy provides the greatest opportunity for limiting waste during construction and operation of the development.

2.3.5 Cleaner Production

The EPP (Waste) defines ‘Cleaner Production’ as program to identify and implement ways of improving a production process so that the process:

- uses less energy, water or another input; or
- generates less waste; or
- generates waste that is less environmentally harmful.

Opportunities for cleaner production and best practice waste management techniques may include the following measures.

- Support to commercial and industrial firms to incorporate cleaner production in all aspects of their operations, as well as their physical facilities.
- Sustainable building principles incorporated into the design controls and guidelines for development of each lot.
- Selecting renewable resources for construction materials, where possible.
- Including a proportion of renewable fuel sources for construction vehicles, plant and equipment.
- A network of pedestrian and cycle pathways will be provided to reduce the reliance on motor vehicle transport.
- Reuse of greywater will be conducted on large lots.

- Treated effluent from the nearby Sewage Treatment Plant will be polished to class A and A+ standards for reuse in irrigation of open space areas and approved uses via a dual reticulation system.
- Golf course irrigation water will be entirely sourced from treated effluent.
- Packaging and environmental measures will be used as a selection criterion for suppliers.
- Colour-coded and/or labelled wheelie bins will be used for recyclable waste streams such as paper, cardboard and aluminium cans.
- Waste storage and recycling areas will be located and designed to complement the streetscape.

Sustainable building principles will promote self sufficiency at the household, community and commercial level by maximising water and energy efficiency and minimising waste generation throughout the lifecycle of each building.

2.3.6 Waste Disposal

Waste disposal refers to the final deposit of waste when the material is of no further use. This may include disposal to landfill. This is considered the least preferred and final option for the management of waste and should only be used where the waste cannot be otherwise reused or recycled.

Waste for disposal will be collected and transported, using appropriately licensed waste contractors, and deposited at the Caboolture landfill, on McNaught Road within the Caboolture Shire. The landfill is less than 10 kilometres from the site. The location of the Caboolture landfill in relation to the proposed development site is provided in Figure 3.

3. ECOLOGICAL SUSTAINABLE DEVELOPMENT

The NEBP development will be designed, constructed and operated with due regard to Ecological Sustainable Development (ESD). The development will achieve the objectives of waste minimisation and management of the 'National Strategy for Ecological Sustainable Development' and the 'National Waste Minimisation and Recycling Strategy' by:

- supporting increased recycling activities, especially in regard to kerbside collections;
- The Environmental Centre will include education of occupants within NEBP on waste management and resource recovery, in particular reduction of waste to landfill;
- supporting increased recycling activities, especially in regard to kerbside collections;
- encouraging commercial and industrial businesses to become involved in recycling activities and support the local community Environment Centre.
- supporting Council pricing/charging structures which adequately reflect the environmental costs of disposal;
- promoting best practice waste management techniques, with particular emphasis on waste avoidance, reduction and minimisation;
- using cleaner production principles during design and construction, and assisting businesses to implement cleaner production principles during operation;
- assessing the life-cycle of wastes produced within the development;
- developing waste reduction targets for occupants of the development to meet; and
- auditing waste management practices on a regular basis.

3.1 Industrial Ecology

Industrial Ecology (IE) is systems science applied to the interface between human activity and natural systems. It is a framework that:

- understands short-term decisions in the context of long-term implications;
- identifies regional and global impacts of local actions; and
- uses a powerful set of methods and tools to guide policy, strategy, design, and investment with awareness of the systems context.

IE provides a systematic method of achieving the objectives of ESD, emphasising the positive side of resource optimisation as an approach to waste minimisation. Eco-industrial development is the side of IE that enables businesses, their employees, and residents to interact in a mutually beneficial manner, helping each other to be more resource efficient and cost effective. The IE approach results in strengthened relationships within and between businesses, the community and the environment.

Eco-industrial initiatives will be managed through the Body Corporate and its Community Title Schemes and Community Management Systems.

Eco-industrial practices for the MIBA can be easily managed due to the proximity of numerous commercial and industrial businesses within a common property. Businesses

can improve environmental, social and economic performance through collaboration on waste minimisation, cleaner production, resource recovery, and environmental management. In some cases companies may be able to use by-products (energy, water and materials) of other companies, rather than disposing of them.

IE offers the following metrics that are relevant to all aspects of the NEBP design, construction, and operation.

1. *The ratio of virgin to recycled materials:* This ratio will be used in assessing the overall materials budget of the development. The lower the relative draw upon virgin materials (to replace materials lost from dissipation) the closer the system will be sustainable.
2. *Ratio of actual/potential recycled materials:* This ratio between of volume of materials that could be recycled to the fraction actually recycled will be a second metric of the NEBP's resource sustainability.
3. *Ratio of renewable/fossil fuel sources:* This ratio is useful in design and construction of the buildings and infrastructure of the NEBP. The Proponents will set goals for improving the ratio in each phase of development.
4. *Materials, water, and energy efficiency:* The development value per unit of input will assess both the development process and operating efficiency of completed precincts.
5. *Resource input per unit of end-user service:* This ratio assesses resource use against the useful function gained and maintained for the end-user. This is a higher level metric for subsystems within the holistic development.

Industrial Ecology and best practice waste management principles that will be considered for the NEBP development are outlined below.

- Development of the buildings within MIBA will incorporate high performance building design and construction. Sustainable building design will be energy and water efficient. For example, building will use passive solar design and use of water efficient fittings.
- Construction of buildings will use a proportion of renewable materials.
- Where excess materials exists following completion of building(s) construction, reuse within the development will be given priority over reuse or disposal outside the development.
- Body Corporate to provide integration details for new businesses in the Community Management System (CMS).
- Body Corporate to provide incentives for waste sharing and use of renewable resources and energy.
- Setting up a database of waste by-products and resources for re-use within the development. By-products could include wastewater, energy and materials.
- Exchanging or trading of energy and water (e.g. "environmental credits").
- MIBA occupants joining to purchase renewable energy as a group, rather than an individual company basis.
- Transport and logistics synergies, from sharing of heavy vehicle transport providers to car pooling for employees.
- Integrated environmental management and control systems, including sharing of emergency response equipment.

- Centralised emergency response procedures.
- Supply of wastewater for use in processes which do not require potable water.

Benefits of applying Industrial Ecology in design, construction, and operation of the development include, but are not limited to:

- Providing a whole system analysis of flows of wasted energy, water, and materials to achieve optimal level of waste minimization and resource recovery;
- Identifying the highest and best use of waste resources that can be recovered;;
- Minimising wastes, leading to a decrease in the volume of waste requiring disposal;
- Increasing revenue through the sale of waste by-products and reduced disposal and transport costs;
- Sharing training and new technologies for waste management; and
- Providing a “green” image for the companies within an “eco” business park.

4. WASTE STREAMS

In order to facilitate the waste avoidance, reuse, reduction and recycle options of the waste management hierarchy, waste collection areas will be provided within the development for storage and segregation of waste materials. The management of some waste streams is well defined, such as colour-coded waste receptacles for paper, cardboard and general wastes.

Waste disposal is only considered when the implementation of the above principles is not practicable. In selecting a waste disposal method, the characteristics of the waste and the transport pathway for potential contamination is considered.

Typically domestic waste comprises approximately 50% of the volume of waste generated and disposed to landfill, construction and demolition waste consists of 25% of waste generated and the remaining 25% of waste streams are re-usable and/or recyclable.

Due to the staging of the development over a 10-12 year period construction and operational waste will be generated simultaneously.

4.1 Construction Wastes

Whenever feasible, construction will include the use of modular components, purchase of materials cut to standard sizes or pre-fabricated materials to reduce the need for off-cuts. Material choices for building construction shall include a proportion of renewable or recyclable components, although use of renewable and recyclable components shall not compromise the construction of the buildings in accordance with the relevant development codes and the Building Code of Australia.

Construction site disturbance will be limited to minimise unnecessary excavation and removal of vegetation. It is anticipated that a neutral surplus of fill will result. If however, there is surplus fill it will be used for topsoil during landscaping. Landscaping for the development will utilise mulch from the native vegetation removed during site preparation.

Separate skip bins will be provided within the construction site compound to facilitate waste segregation and maximise economic reuse and recycling.

Contracts for builders and suppliers shall include an environmental performance component. Contractors and suppliers will have to pre-qualifying for tendering based on environmental performance and consideration of potential environmental impact of supplying the material or good. Builders and suppliers shall also be required to identify the source of the material or good, seek to provide alternatives and not just automatically use new materials, provide options for pre-fabrication, minimize packaging materials and access to “just in time” ordering.

Construction project management is also important for managing waste streams. For example, works scheduling organising trades, material delivery and placement, construction site compound layout and organisation can contribute to effective reuse and minimisation of wastes.

Plastic waste will be kept to a minimum with alternatives to plastic being a selection criterion for suppliers delivering materials for construction. For example when feasible, requisitions will order metal strapping instead of plastic wrapping or shrink wrap. Any plastic waste generated will be recycled, where possible.

Fuel storage will be kept to a minimum and will be used for refuelling of equipment during construction. Storage and handling of fuels will be conducted in accordance with *AS1940 – 2004 The storage and handling of flammable and combustible liquids*. Where possible, a proportion of the fuel used in the construction vehicles, plant and equipment shall include renewable fuels and/or ethanol based fuel.

Capital dredging of the navigation channel in the Caboolture River will be conducted during construction. Approximately 545,000m^3 of dredge spoil will be generated. The dredge spoil shall be treated for potential Acid Sulphate Soils (ASS) and used as fill within the NEBP development, on Lot 24 on Plan SP158289. The dredge spoil disposal area is approximately 51 hectares in size.

Tailwater from the dredge spoil area may be produced during dredging activities. The tailwater treatment system will include a series of treatment ponds to be constructed within the dredge spoil disposal area on Lot 24 on Plan SP158289. The tailwater treatment system will enable further settlement of sediment from the tailwaters. The water will be tested, and treated if necessary, to ensure the required water quality parameters are met, prior to being released to the receiving environment, namely the Caboolture River.

Any construction waste that cannot be recycled or reused and requires disposal, will be transported to the Caboolture landfill. A waste acceptance agreement must be sought from the Landfill Manager prior to dispatch of waste from the site. Records of approval will be kept on file as part of the recording requirement of the Waste Management Plan (Section 6).

An inventory of wastes likely to be generated during the construction of the development is outlined in Table 1 below. Actual waste estimates are approximate and may vary from that anticipated.

Table 1 Inventory of Solid and Liquid Wastes Produced on site during Construction

Waste Description	Anticipated Waste Volume Generated (% of total materials ordered, or otherwise specified)	Waste Storage	Waste Management Technique	Frequency of Collection
Fill and soil (not contaminated)	Cut volume 4,304,939m^3 Fill volume 3,744,951m^3	Dedicated stockpile location at each stage of construction located away from overland flowpaths and near the construction site compound.	Reused on the site where possible.	As required.
Fill and soil (contaminated)	Approximately 20m^3 of material has been identified as potentially contaminated due to past activities such as dipping cattle, underground fuel storage and illegal waste disposal.	Dedicated stockpile located away from overland flowpaths.	Disposal destination to be specified in the Disposal Permit issued under the conditions of the Contaminated Land section Chapter 7, Part 8 of the EP Act.	As per Disposal Permit.

Waste Description	Anticipated Waste Volume Generated (% of total materials ordered, or otherwise specified)	Waste Storage	Waste Management Technique	Frequency of Collection
Capital dredge spoil and tailwaters	545,000 m^3	Dredge spoil shall be transferred directly from the Caboolture River to the disposal location within the NEBP development, on Lot 24 on Plan SP158289.	Treated for potential ASS and used as fill within the NEBP development, on Lot 24 on Plan SP158289. The disposal area is approximately 51 hectares in size. Tailwater from the series of tailwater treatment ponds will be discharged to the Caboolture River following settlement, testing and treatment if required.	Capital dredging works over a 21 month period.
ASS	To be validated during monitoring.	Dedicated stockpile location at each stage of construction located away from overland flowpaths, in accordance with the Acid Sulfate Soils Management Plan (19 November 2007).	On site treatment and reuse as fill.	As required.
Groundwater seepage during excavation	Not known	Will be treated in situ and discharged	Treated for potential acidity and water quality objectives, in accordance with the ASSMP and CEMP.	As required.
Timber	5%	Storage bay with separation of reusable materials from wood scrap.	Timber off cuts to be reused onsite where possible, otherwise will be transported and processed at the Waste Transfer Station at Caboolture landfill, ideally for reuse in other construction. Scrap wood could be shredded for composting on site.	Weekly during construction.
Vegetation	47,000 m^2	Dedicated green	Mulching for reuse	As required.

Waste Description	Anticipated Waste Volume Generated (% of total materials ordered, or otherwise specified)	Waste Storage	Waste Management Technique	Frequency of Collection
		waste storage bay in construction site compound.	on site as landscaping material.	
Scrap metal	3-5%	Metal recycling skip bin in construction site compound.	Metal recycling contractor off site.	Weekly during construction.
Cable and wire	1%	Metal waste segregated into metal recycling skip bin. Plastic waste segregated into dedicated plastic skip bin. Other waste not capable of reuse or recycling to placed in the general waste skip bin within the construction site compound.	Metal Recycling Contractor off site. Plastic Recycling Contractor off site. Other waste disposed to Caboolture landfill.	Weekly during construction.
Concrete, bricks, tile and rubble	5-20%	Dedicated construction waste skip bin within the construction site compound.	Disposal to Caboolture landfill or ground for aggregate.	Weekly during construction.
Plasterboard	5-20%	Dedicated construction waste skip bin within the construction site compound.	Reused on site, where possible or disposed of at Caboolture landfill.	Weekly during construction.
Packaging wastes, plastic, glass and timber	5%	Separate skip bins provided for plastic, glass and timber within the construction site compound.	Recycled off site.	Weekly during construction.
Domestic and general waste, incl. organic and food waste	52%	Dedicated general waste skip bins within the construction site compound.	Disposal to Caboolture landfill.	Twice weekly during construction.
Domestic wastewater	140 litres per Equivalent Person (EP), per day[1].	Licensed waste contractor until tertiary wastewater treatment plant is constructed and operational.	Treated effluent will be polished to class A and A+ for reuse in irrigation and approved uses via a dual reticulation system. Greywater will be	Continuous.

Waste Description	Anticipated Waste Volume Generated (% of total materials ordered, or otherwise specified)	Waste Storage	Waste Management Technique	Frequency of Collection
			reused on large lots.	
Contaminated stormwater runoff	Dependant on rain event.	Stormwater containment and treatment devices.	Containment, treatment and release as per Stormwater Management Plan.	Following a rain event.
Diesel and other fuels	Diesel storage up to 50,000 litres and Unleaded petrol storage up to 20,000 litres.	Bunded drum store within construction site compound.	To be collected, transported and recycled by a Fuel Recycling Contractor off site.	Monthly during construction.
Paints and other chemicals	1%	Bunded drum store within construction site compound.	To be collected, transported and disposed of by an EPA licensed waste contractor off site.	As required.
Water collected in waste storage and bunded areas.	Dependant on volume of bund.	Bunded area	Treatment to water quality objectives outlined in CEMP and then discharged, otherwise collection by an EPA licensed waste contractor.	Following a rain event.

[1] Source: AS/NZS 1547:2000 On-site domestic wastewater management.

4.1.1 Waste Collection

Wastes will be temporarily stored in the construction site compound prior to being transported to either the Waste Transfer Station or disposal cell at the Caboolture landfill by an appropriately licensed waste contractor. Wastes will be sorted and stored according to waste stream. The Contractor will be responsible for relocating construction waste from the temporary waste storage location within the construction site compound to the Waste Transfer Station at the Caboolture landfill.

Timber pallets and packaging material shall be collected and returned to the suppliers at the time of the next delivery.

4.1.2 Waste Transportation

The majority of wastes that can not be reused or recycled on site will be transported to the Waste Transfer Station and Landfill at Caboolture. The distance of the landfill to the site is less than 10 kilometres, therefore the travel cost and time will not significantly impact on the reuse, reduction, recycling and disposal of wastes. The location of the Caboolture landfill and Waste Transfer Station is illustrated in Figure 3.

The *Environmental Protection (Waste Management) Regulation 2000* provides the framework for waste tracking in Queensland of "trackable wastes". Trackable wastes are outlined in Schedule 1 of this Regulation.

Wastes are tracked and reported to the EPA in order to protect the environment by minimising the impact of waste on the environment and human health. A waste tracking system enables regulatory agencies to track waste from the place of generation to the place of storage, recycling, treatment or disposal. The objectives of waste tracking are to ensure that all parties involved with the management of the waste take a responsible attitude towards this management and to ensure that the waste is transported and managed appropriately so as to prevent environmental harm.

Waste generators, transporters and receivers provide information to the EPA about the transport of trackable waste by paper or electronic systems.

The EPP (Waste) outlines the issues to be addressed when transporting regulated and trackable waste, such as:

- the type of waste;
- the vehicles, storage tanks, containers and other equipment used for the transportation;
- sampling of the waste;
- monitoring and reporting of matters concerning the waste;
- emergency response planning;
- keeping of records about the transportation.

Wastes generated by the supply and delivery of raw materials and wastes disposed off site will be minimised. As far as practicable, the transport of raw materials, products and waste will involve full loads, so as to minimise fuel use.

All outgoing wastes from the site will be transported by road using appropriately licensed waste transporters and a copy of the waste tracking documentation will be completed and retained, as per the Waste Management Plan outlined in Section 6. All waste loads transported off site will be covered, where practicable.

4.1.3 Waste Disposal

All wastes will be segregated and stored according to waste streams within the construction site compound before their transport to the Caboolture landfill. Caboolture landfill is operated by the Caboolture Shire Council and is capable of accepting construction and demolition wastes and provides recycling where possible at the Waste Transfer Station and Recycling Shop at the landfill. Alternatively there are licensed waste collectors in the region that can collect, segregate and recycle most waste streams generated during the construction of the proposed development.

No burial of wastes will be conducted on site, all domestic and general waste will be disposed of at Caboolture landfill within the Caboolture Shire. No hazardous waste will be disposed of on the site. Waste management disposal options for construction wastes are identified in Table 1, Section 4.1.

Waste disposal records will be retained as part of the Waste Management Plan, outlined in further detail in Section 6 of this report.

4.2 Operational Wastes

Domestic and general waste will be the largest waste stream generated during operation of the development. The remaining wastes streams generated include recyclable wastes such as paper, cardboard, plastics, glass, metals and organic waste.

Colour-coded and/or labelled wheelie bins will be provided to segregate and collect these wastes streams. These bins will be located at temporary waste compounds to be designed and located at each residential lot, marina, hotel, golf course, commercial, retail and industrial business. These temporary bin compounds will be designed and located to ensure that they are easily accessible from each part of the building and from the collection point and includes adequate access and manoeuvring space, at least an area equivalent to the combined footprint of the bins.

Plastic waste will be kept to a minimum and retail outlets will be encouraged to supply alternatives to plastic bags, such as biodegradable or cotton bags. Any plastic waste generated will be recycled, where possible.

Based on siltation modelling of the Caboolture River conducted in November 2007 by Cardno Lawson and Treloar minor maintenance dredging will be required every two years at some locations in the navigational channel in the Caboolture River. The minor dredging will generate approximately 40,000m^3 of dredge spoil. Dredging of the entire navigational channel will be required every five years and will generate 220,000m^3 of dredge spoil.

The dredge spoil location for maintenance dredging up to approximately 2017 (Construction Stage 9) will be a 51 hectare area on Lot 24 on Plan SP158289, which will be used for residential purposes, and is designated as Residential East 3(2) area on the proposed Development Plan.

The dredge spoil disposal area identified above provides for at least two episodes of maintenance dredging. During this period, an understanding of the quantity and characteristics of dredge material will be gained and this will allow appropriate designation of a longer term maintenance spoil disposal location ensuring effective and low risk treatment and management. This strategy for planning for long term disposal of dredge spoil is consistent with government initiatives to investigate alternative long-term spoil disposal options in Southeast Queensland.

Use of hazardous chemicals will be minimal, however, some pesticides and other chemicals may be used during maintenance of the golf course and other open space areas, as part of municipal duties to be undertaken by the Operator of the development. Storage and handling of hazardous and other chemicals will be in accordance with the relevant Australian Standard.

An inventory of wastes likely to be generated during the operation of the development is outlined in Table 2 below. Actual waste estimates may vary from that anticipated.

Table 2 Inventory of Solid and Liquid Wastes Produced on Site during Operation

Waste Description	Anticipated Waste Volume Generated	Waste Storage	Waste Management Technique	Frequency of Collection (during normal operation)
Domestic and general waste	1.05 tonnes per person, per annum[1]	Individual general waste bins at each residence, business and at temporary bin compounds at commercial and	To be collected and transported to Caboolture landfill by the approved Council waste contractor.	Weekly.

Waste Description	Anticipated Waste Volume Generated	Waste Storage	Waste Management Technique	Frequency of Collection (during normal operation)
		tourist sites.		
Organic and food waste		Promotion of composting at individual residence/premises, where feasible.	Reuse as landscaping material and soil conditioners within the development.	As Required.
Maintenance dredge spoil and tailwaters	40,000m^3 every two-three years. 200,000m^3 every five years.	Dredge spoil shall be transferred directly from the Caboolture River to the disposal location within the NEBP development, on Lot 24 on Plan SP158289 until approximately 2017. After which an alternative dredge spoil disposal location will be identified in accordance with the current policies and guidelines prepared by the State government.	Treated for potential ASS and used as fill within the NEBP development, on Lot 24 on Plan SP158289. The disposal area is approximately 51 hectares in size. Tailwater from the series of tailwater treatment ponds will be discharged to the Caboolture River following settlement, testing and treatment if required.	Minor dredging at some location in the Caboolture River navigation channel every two-three years, with the entire navigational channel being dredge every five years.
Green waste	Not known	Storage locations provided within each precinct.	To be mulched and reused on site, where feasible. Alternatively, it will be collected and transported to the green waste facility at Caboolture landfill's Waste Transfer Station.	As required.
Domestic wastewater	140 litres per EP, per day[2]	South Caboolture Sewage Treatment Plant.	Treated effluent will be polished to class A and A+ for reuse in irrigation and approved uses via a dual reticulation system. Greywater will be reused on large lots.	Continuous.
Metals	0.75 tonnes of domestic recyclable waste per person, per annum[1]	Dedicated metal recycling bins at various locations within the development, especially within the	Recycling contractor off site.	Fortnightly, or as required.

Waste Description	Anticipated Waste Volume Generated	Waste Storage	Waste Management Technique	Frequency of Collection (during normal operation)
		marine industry area and MIBA.		
Plastics		Domestic recycling bin provided at each residence/premises. Non-domestic recycling bin(s) provided within each precinct.	To be collected and transported to the Waste Transfer Station at Caboolture landfill by a licensed waste contractor.	Fortnightly, or as required.
Glass		Domestic recycling bin provided at each residence/premises. Non-domestic recycling bin(s) provided within each precinct.	To be collected and transported to the Waste Transfer Station at Caboolture landfill by a licensed waste contractor.	Fortnightly, or as required.
Paper and cardboard		Domestic recycling bin provided at each residence/premises. Non-domestic recycling bin(s) provided within each precinct.	To be collected and transported to the Waste Transfer Station at Caboolture landfill by a licensed waste contractor.	Fortnightly, or as required.
Diesel and other fuels	Marina fuel storage not more than 100,000 litres.	Storage in bunded storage areas within the marine and commercial precincts.	Commercial quantities to be collected by a recycling contractor. Household quantities to be transported to the oil recycling container provided at the Waste Transfer Station, in the Caboolture landfill.	As required.
Hazardous and other chemicals	Not known.	Storage in bunded storage areas within MIBA, marine industry and commercial precincts, resort/hotel, and golf course.	To be collected and transported off site by a licensed waste contractor.	As required.
Electrical and electronic equipment (E-waste)	Not known.	Dedicated e-waste bin within the residential, MIBA and commercial precincts.	Recycled and re-manufactured off site by a licensed waste contractor.	Annually, or as required.
Marina wastes (sewage and bilge water pump out facilities)	Dependant on throughput.	Storage tank provided at the marina.	To be emptied by an appropriately licensed waste contractor.	Not less than weekly, or as required during busy periods.

Waste Description	Anticipated Waste Volume Generated	Waste Storage	Waste Management Technique	Frequency of Collection (during normal operation)
Contaminated stormwater runoff	Dependant on rain event.	Stormwater containment and treatment devices.	Containment, treatment and release as per Stormwater Management Plan.	Following a rain event.
Water collected in waste storage and bunded areas	Dependant on volume of bund.	Bunded area	Treatment to water quality objectives outlined in SBMP and then discharged, otherwise collection by an EPA licensed waste contractor.	Following a rain event.

[1] Source: Australian Bureau of Statistics (4613.0 – Australia's Environment: Issues and Trends, 2006).
[2] Source: AS/NZS 1547:2000 On-site domestic wastewater management.

4.2.1 Waste Collection

It is anticipated that commercial waste collection operations will be utilised during construction and operation for the collection and appropriate disposal of generated commercial waste. It will be the responsibility of the construction contractor or commercial operation/enterprise to engage the commercial waste collection service.

Domestic waste collection will be conducted by the Local Government as part of domestic waste collection services. General waste will be collected weekly with recyclables collected fortnightly.

4.2.2 Waste Transportation

The *Environmental Protection (Waste Management) Regulation 2000* provides the framework for waste tracking in Queensland of "trackable wastes". Trackable wastes are outlined in Schedule 1 of this Regulation.

Wastes are tracked and reported to the EPA in order to protect the environment by minimising the impact of waste on the environment and human health. A waste tracking system enables regulatory agencies to track waste from the place of generation to the place of storage, recycling, treatment or disposal. The objectives of waste tracking are to ensure that all parties involved with the management of the waste take a responsible attitude towards this management and to ensure that the waste is transported and managed appropriately so as to prevent environmental harm.

Waste generators, transporters and receivers provide information to the EPA about the transport of trackable waste by paper or electronic systems.

The EPP (Waste) outlines the issues to be addressed when transporting regulated and trackable waste, such as:

- the type of waste;
- the vehicles, storage tanks, containers and other equipment used for the transportation;

- sampling of the waste;
- monitoring and reporting of matters concerning the waste;
- emergency response planning;
- keeping of records about the transportation.

Wastes generated by the supply and delivery of raw materials and wastes disposed off site will be minimised. As far as practicable, the transport of raw materials, products and waste will involve full loads, so as to minimise fuel use.

All outgoing wastes from the site will be transported by road using appropriately licensed waste transporters and a copy of the waste tracking documentation will be completed and retained, as per the Waste Management Plan outlined in Section 6. All waste loads transported off the site will be covered, where practicable.

4.2.3 Waste Disposal

All wastes will be segregated and stored according to waste streams at the temporary bin compounds before their transport to the Waste Transfer Station and landfill at Caboolture. All wastes will be segregated and stored in colour-coded and/or labelled bins according to waste streams at this facility.

No burial of wastes will be conducted on the site, all domestic and general waste will be disposed of at Caboolture landfill within the Caboolture Shire. No hazardous waste will be disposed of on the site. Waste management disposal options for operational wastes are identified in Table 2, Section 4.2.

Waste disposal records will be retained as part of the Waste Management Plan, outlined in further detail in Section 6 of this report.

Each residential lot will be provided with a 140 litre wheelie bin for general refuse and a 240 litre wheelie bin for recyclables, such as paper, cardboard, aluminium cans and glass. Residential lots will be serviced by a kerbside collection where general refuse will be collected weekly and recyclables collected fortnightly.

Apartment buildings will have collection and storage areas for household waste and recyclables, at a frequency to be nominated between Caboolture Shire Council and the Body Corporate.

Commercial and industrial premises will need to enter into a waste arrangement with a licensed waste contractor for collection and disposal of general waste. Each business will be responsible for their own waste management.

5. POTENTIAL IMPACTS AND MITIGATION MEASURES

Northeast Business Park site is located on the Caboolture River and adjacent to the Moreton Bay Marine Park, Deception Bay declared Fish Habitat Area and Moreton Bay Ramsar wetlands. The proposed development area previously supported exotic pine plantations and more recently used for agricultural purposes.

Some risks to the environment may occur as a result of waste management activities. The environmental risks range from potential environmental harm, such as pollution of waterways, to environmental nuisance, such as odour complaints. The potential impacts of the proposed development on the receiving environment are listed below.

- Waste spills and loss of containment of waste resulting in impacts to soils, surface water, groundwater, terrestrial and marine fauna, and human health.
- Flooding of temporary waste storage areas causing dispersal.
- Littering and contamination of waterways.
- Plastic waste causing mortality to marine fauna.
- Waste spills and related incidents from transportation of waste on and off the site.
- Cross contamination of wastes, making wastes unsuitable for reuse and/or recycling, thus increasing the quantity of waste being disposed of to landfill.
- Increased pressure on regional landfills, requiring early closure and replacement.
- Odour and noise generation from waste handling and storage.
- Propagation of pests, vermin and disease vectors.

To minimise the impacts outlined above, the following mitigation measures will be undertaken during construction and operation of the proposed development:

- Wastes to be managed in accordance with the *Environmental Protection (Waste Management) Regulation 2000*.
- Waste avoidance, minimisation, reuse and recycling principles to be utilised wherever possible, especially those provided in Section 2 and 3 of this report.
- Wastes to be segregated to assist in recovery and recycling.
- Construction and demolition wastes to be reused and recycled, wherever possible.
- No disposal of solid or hazardous wastes on site.
- Construction Materials will be fabricated off site where possible to minimise the generation of waste.
- In order to reduce waste volumes, where possible, all wastes generated from construction and operational activities will be reused on site or sent to recyclers. Disposal to appropriately licensed waste facilities will only be undertaken where reuse or recycling is not possible or feasible.
- Where appropriate waste generators will be encouraged to segregate wastes at the source to minimise cross contamination of waste streams.
- Waste will only be transported by appropriately licensed waste transporters.
- Colour-coded and/or labelled bins will be provided for each waste stream to assist in the segregation of wastes and maximise waste recovery and recycling.
- Alternatives to plastic bags to be provided at retail outlets.

- Design of marina waste facilities in accordance with 'Best Practice Guidelines for Waste Reception Facilities at Ports, Marinas and Boat Harbours in Australia and New Zealand'.
- Operation of the marine with regard to the Marina Industries Association of Australia (MIAA) 'Clean Marinas' accreditation programme.
- Records of waste quantities removed from the site are to be maintained.
- A waste audit will be conducted when the development is operational and when each new stage of development becomes operational. The purpose of the waste audit will be to identify:
    - types and volumes of wastes generated;
    - further opportunities for waste avoidance, reuse and recycling;
    - waste storage and segregation methods;
    - waste treatment and disposal techniques; and
    - destination of waste materials.

A Waste Management Plan is to be developed and implemented, which incorporates the mitigation measures outlined in the previous and current sections of this report.

A summary of the wastes generated during construction and operation of the development and their proposed waste management technique is provided in Table 3.

Table 3 Waste Management Summary

Waste Source	Waste Type	Waste Management Technique
Construction	Fill and soil (not contaminated)	Reuse
Construction	Fill and soil (contaminated)	Disposal
Construction	Dredge spoil	Reuse, as fill
Construction	Tailwaters from dredge spoil disposal.	Treatment and discharge or disposal
Construction	Acid Sulphate Soils	Treatment and reuse
Construction	Groundwater seepage during excavation	Treatment and disposal
Construction	Timber	Reuse
Construction	Vegetation	Reuse, as mulch/compost
Construction	Scrap metal	Recycle
Construction	Cable and wire	Recycle or disposal
Construction	Concrete, bricks, tiles and rubble	Reuse as crushed aggregate, where feasible
Construction	Plasterboard	Reuse or disposal
Construction	Packaging wastes, plastic, glass and timber	Recycle
Construction	Domestic and general waste	Disposal
Construction	Organic and food waste	Compost
Construction	Domestic wastewater	Post treatment reuse

Waste Source	Waste Type	Waste Management Technique
Construction	Contaminated stormwater runoff	Treatment and discharge or disposal
Construction	Diesel and other fuels	Recycle
Construction	Paint and other chemicals	Disposal
Construction	Water collected in waste storage and bunded areas	Treatment and discharge or disposal
Operation	Domestic waste	Disposal
Operation	Organic and food waste	Compost
Operation	Maintenance dredge spoil	Reuse, as fill
Operation	Green waste	Reuse
Operation	Domestic wastewater	Post treatment reuse
Operation	Metals	Recycle
Operation	Plastics	Recycle
Operation	Glass	Recycle
Operation	Paper and cardboard	Recycle
Operation	Diesel and other fuels	Recycle
Operation	Hazardous and other chemicals	Disposal, through approved technology
Operation	Electrical and electronic equipment (E-waste)	Recycle or re-manufacture
Operation	Marina sewage pump out	Disposal
Operation	Contaminated stormwater runoff	Treatment and discharge or disposal
Operation	Water collected in waste storage and bunded areas	Treatment and discharge or disposal

6. WASTE MANAGEMENT PLAN

This Waste Management Plan (WMP) has been prepared to prevent the risk of environmental harm occurring as a result of waste generation during the construction and operation of the proposed development.

A waste management component has been incorporated in to a Construction Environmental Management Plan (CEMP) and Site Based Management Plan (SBMP) for Environmentally Relevant Activities. The CEMP and SBMP have been prepared to support the Environmental Impact Statement and will be implemented prior to commencement of construction and operation, respectively. This WMP should be read in conjunction with the CEMP and SBMP.

In developing the waste management component of the CEMP and SBMP the following issues were considered:

- Address waste reduction at source (eg, orders to size, purchases in bulk).
- Encourage trials into alternative sustainable packaging techniques (eg, metal strapping in preference to shrink wrap, paper packaging as opposed to plastic, and shredded paper as opposed to foam).
- Use of reusable delivery and storage containers where possible.
- Efficient ordering systems to ensure minimal wastage.
- Purchases recycled products where viable and recycles, where possible.
- Marina Industries Association of Australia (MIAA) 'Clean Marinas' accreditation programme.

6.1 Components of the Waste Management Plan

Objectives: the specific goals that are set for waste management to be achieved with regard to the rationale.

Tasks/Actions: the measures to be implemented to manage the identified impacts and to implement the objectives.

Performance Indicators: the criteria to be measured to ensure achievement of the objectives for waste management.

Frequency/Timelines: the time frame in which each of the tasks or actions is to be completed.

Responsibility: Assignment of responsibility for implementing measures, monitoring impacts and reporting.

Monitoring and Reporting: the required monitoring and reporting arrangements for implementation measures.

Corrective Actions: the measures to be undertaken if the objectives are not met as identified by monitoring for improvement of environmental performance.

6.2 Objectives

The following objectives will be adopted for management of waste during development.

- To ensure procedures are implemented during construction to minimise environmental impacts and properly dispose of pollutants and waste materials arising from construction processes.
- To employ waste avoidance and reduction strategies during construction and operation to eliminate waste at the source by reviewing site procedures and purchase of materials.
- To implement measures for evaluation of all waste stream elements and identification of wastes that can be reused or recycled.
- To adopt implementation measures during construction and operation of the development to minimise the volume of waste sent to landfill and to prevent wastes entering the stormwater drainage network.

6.3 Tasks / Actions

The following waste management tasks and actions shall be implemented during the construction and operation of the development.

6.3.1 Documentation

Construction

Construction Contractors shall maintain a regular waste removal schedule and document all waste disposal activities. These activities shall be listed on a Waste Register Form, an example of which is provided in Appendix A of this WMTR.

Operation

The Operator of the development shall maintain a regular waste removal schedule and document all waste disposal activities. These activities shall be listed on a Waste Register Form, an example of which is provided in Appendix A of this WMTR.

Marina

The Marina Manager shall maintain a regular waste removal schedule and document all waste disposal activities, especially in relation to the marina sewage pump out facilities. These activities shall be listed on a Waste Register Form, an example of which is provided in Appendix A of this WMTR. Other important documentation for marina management should include maintenance procedures, cleaning procedures including frequency and cleaning agents used.

6.3.2 Training and Education

Construction

Waste management training shall be included in the site induction prior to personnel commencing work in the development area to inform all staff and contractors of the relevant policies and legal requirements; the potential impacts of waste spillage and dispersal; the correct procedures for separation and appropriate disposal of waste materials and the roles and responsibilities of all parties.

The Contractor shall provide appropriate methods for the collection and lawful disposal of any wastes generated at the site during the works. Instructions to site workers for the handling, storage, and disposal of each type of waste shall be provided by the Contractor in an induction and training programme during both the site preparation and construction phases. Due to the long term construction in stages over a number of years refresher induction and training courses shall be provided. The Contractor shall maintain records of training.

All contractors and staff shall be provided with a copy of this WMP and shall be informed of the location of waste holding and collection areas on the site.

Operation

The Operator of the development shall provide adequate information to residents on the opportunities and procedures for waste minimisation and recycling on the site-and the handling of household toxic materials.

The waste receptacles provided for each lot will be colour-coded and/or labelled to identify what wastes can be deposited in each bin.

Waste education and clean-up initiatives such as Clean-up Australia day campaigns will be implemented on the site.

The education centre will also provide information and training on waste minimisation, reuse and recycling.

Residents and commercial operators will be encouraged not to use plastic bags.

Marina

Marina management and staff, both permanent and casual, must be trained in all facets of marina operations, such as operation of piping, pumping, tank arrangements and tank cleaning methods. Other aspects of marina operation include emergency response procedures, safety, hazard prevention, fuel spillage, sewage and pollution, navigation, community amenity and marina user regulations.

6.3.3 Separation of Waste Materials

Construction

All waste materials shall be assessed for the ability to be reused or recycled to minimise the volume of waste requiring disposal. Separate waste bins shall be provided for reuse of these waste materials. Waste materials that cannot be reused on the site shall be separated into designated storage bins for collection. Disposal of waste shall be considered as the last option, when all other strategies in the hierarchy of waste management have been considered.

Temporary waste storage bins shall be provided within the construction site compound for each stage of construction prior to transporting the waste to the Waste Transfer Station at Caboolture landfill.

Waste storage bins shall be colour coded and/or labelled for separation of wastes into categories. Australian Standard *AS4123.7 – 2006 Mobile waste containers Part 7: Colours, markings and designation requirements* specifies the appropriate bin and/or label colour for the associated waste streams.

General waste	Dark Green or black bin with a red lid
Green waste (for mulching)	Dark green or black bin with a lime green lid
Plastics	Dark green or black bin with an orange lid
Paper and cardboard	Dark green or black bin with a blue lid
Glass	Nature green bin with a yellow lid
Aluminium cans	Yellow
Metal	Dark green or black bin with a light grey lid
Organic and food waste (for composting)	Dark green or black bin with a burgundy lid
Electronics	Dark green or black bin with a white lid

Adequate signage shall be provided for all waste storage bins and disposal skip bins.

Large items of waste that do not fit into waste receptacles shall be removed as soon as is practicable and not accumulated on the site.

Domestic litter generated by construction workers shall be delivered to the designated skip bins within the construction site compound on a daily basis.

Native vegetation cleared during site preparation for construction shall be mulched for reuse as landscaping material. Non native vegetation cleared during site preparation for construction shall be removed to a licensed landfill.

No waste materials shall be buried or burnt on the site.

Designated skip bins shall be provided within the temporary waste compound for separation of:

1. domestic wastes of staff and contractors;
2. waste materials intended for disposal; and
3. paper, cardboard, unusable timber, glass, metals and plastic for recycling.

Operation

The Operator of the development shall provide colour-coded and/or labelled wheelie bins at each lot for the separation of domestic waste and recyclable materials generated as a result of operation activities. Information shall be provided to residents and visitors on the appropriate materials and methods for recycling. The colour of the bin and/or label will follow *AS4123.7 – 2006 Mobile waste containers Part 7: Colours, markings and designation requirements* outlined above.

Bin compounds at each lot are to be designed and landscaped to blend in with the environment. Bin compounds shall be located so unobstructed access is available for manoeuvring bins for waste collection.

The Operator shall ensure that a waste contractor is engaged to manage commercial wastes. The Local Government will provide waste collection services for domestic premises which ensures that the waste from each lot is collected and transported to the Waste Transfer Station at Caboolture landfill.

Marina

Waste storage facilities will be provided in accordance with the Best Practice Guidelines for Waste Reception Facilities at Ports, Marinas and Boat Harbours in Australia and New Zealand'.

Bin compounds provided at the marina will be designed and landscaped to blend in with the environment. Bin compounds shall be located so unobstructed access is available for manoeuvring bins for waste collection.

The Marina Manager shall ensure that a waste contractor is engaged to manage all wastes produced in the marina and marine precinct.

6.3.4 Waste Storage and Processing

Construction

During construction, the temporary bin compounds shall be located in an appropriate area away from overland flowpaths and sensitive environments. The construction site compound waste storage bins shall be collected weekly.

Enclosed bunded storage facilities are to be provided for fuels and other chemical wastes. Dangerous and hazardous materials shall not be disposed of into general waste bins or disposed of on the site.

All dangerous and hazardous waste materials shall be listed on the Waste Register Forms provided in Appendix A and appropriate storage and disposal procedures shall be identified. Waste shall not be incinerated on the site.

Waste materials such as concrete, plaster or paint shall be allowed to dry and removed to a facility licensed to receive the waste. Solid wastes shall be stored in suitable refuse containers to prevent contamination of stormwater. Waste containers shall be located in accessible areas.

Material stockpiles shall be located within the temporary construction site compound and shall not be placed in surface water overland flowpaths.

A spill response procedure shall be established and appropriate cleanup materials provided where construction activities are undertaken.

All waste shall be removed from the site by a licensed waste contractor.

All regulated waste as defined by the *Environmental Protection Regulation 1998* shall be removed by a regulated waste transporter licensed by the EPA. Waste tracking shall be undertaken to provide details of waste classification and volume, date of removal, transporter details and proposed destination.

Operation

During operation, all waste will be transferred to the Waste Transfer Station at Caboolture landfill by a licensed waste contractor.

Waste storage bins will be provided for the waste streams identified in Section 4, additional bins may be required during peak periods. General waste and recyclable waste generation rates per person per annum are anticipated to be 1.05 tonnes and 0.75 tonnes, respectively. The population on the site for the whole development is in excess of 6000 people, however, due to the staging of the development will take between 15 to 20 years, thus construction and operational waste will be generated simultaneously. All wastes will be processed off the site.

The Operator shall ensure there are no unnecessary obstructions to waste and recycling collection vehicles on the site. The bulk waste skip bins shall be positioned so that the waste collection vehicles have unimpeded access to the waste skip bins. The collection shall be twice per week during normal trading, and every second day during peak periods.

Marina

During operation, all waste will be transferred to the Waste Transfer Station and disposal cell at Caboolture landfill by a licensed waste contractor.

Waste storage bins will be provided for the waste streams identified in Section 4, additional bins may be required during peak periods. All wastes will be processed off the site.

The Marina Manager shall have due regard to the waste management hierarchy.

The Marina Manager shall provide appropriate methods for the collection and lawful disposal of any wastes produced at the site during operation including:

- location of waste receptacles in designated areas suitable for collection by waste disposal vehicles;
- all waste to be collected and disposed of by appropriately licensed contractors at appropriate intervals;
- storage of solid waste in suitable refuse containers to prevent contamination of stormwater, and access to vermin and birds;
- waste containers located in convenient locations to encourage use; and
- facilities for the reception of wastes shall include provision for a range of materials likely to be produced, and are well labelled and sign posted.

Facilities for the washing of waste containers are to be provided. Any waste container washing will be collected and treated before discharge.

Facilities for the segregation of wastes shall be provided to facilitate the reuse or recycling of waste materials.

Facilities for waste collection are to be maintained in a serviceable condition.

Implement a strict “no discharge in marina” policy and inspection program.

Hull and propeller cleaning is not allowed in marina waters to prevent the possible release of contaminants or introduced marina pests.

The operation of hardstands and use of antifoulant products must be in accordance with the Australian and New Zealand Environment and Conservation Council (ANZECC) Code

of practice (1997). Codes recommend that all antifoulant paints be treated as contaminated waters.

Any hardstand must be operated to strict environmental requirements documented in the ANZECC *Code of Practice for Antifouling and In-water Hull Cleaning and Maintenance*.

In-water cleaning or scrubbing of hulls painted with biocide-containing antifouling paints for the purpose of delaying dockings or attempting to rejuvenate depleted antifouling coatings must not be undertaken. Any boat maintenance and repairs must be undertaken in such a way that debris and waste is kept to a controlled minimum and is collected and disposed of in an environmentally responsible manner.

Site-specific housekeeping rules shall be clearly displayed in the marina office and a copy shall be provided to each customer, as amended from time to time.

The Marina Manager shall ensure that all personnel are appropriately trained in the correct techniques for responsible waste disposal.

Marina Sewage Pump-out Facility and Bilge Water

A pump out facility for the reception of sewage and bilge water will be provided in the marina. It will be maintained to ensure it is working efficiently. Other facilities such as adequate on site ablution and laundry facilities will also be made available.

Contracts for marina berths, storage and mooring agreement will contain conditions relating to nil release policy from vessels into waters of the marina. The Marina Manager will enure the Agreement is formally completed, explained to the customer and a customer copy is issued.

The sewage pump-out and bilge water policy will be displayed in the marina office and at other prominent locations, and a copy provided to each customer.

Marina patrons are to be directed to waste reception facilities for the proper disposal of sewage and bilge water.

Litter Control

A daily inspection of the waste storage areas will be completed by the Operator, or appointed representative. The inspection will review bin capacity and determine if additional waste collection services are required.

Waste receptacles provided for the storage of paper and plastics will be covered to prevent wind-blown litter and restrict access by bird, animals and vermin.

Waste receptacles will be emptied frequently to minimise litter production and regular surveillance and cleaning of public areas will be undertaken.

All waste transported on and off the site will be covered, where practicable.

Installation of gross pollutant traps, bunds and other controls to prevent litter, from on shore areas from reaching waterways will be installed and maintained regularly to ensure maximum efficiency.

Odour and Dust Control

The following strategies will be followed to minimise odour and dust generation and prevent environmental nuisance:

- waste receptacles and storage bins for organic and food wastes will be covered;
- minimising retention time of wastes on site;
- water captured in bunds and sumps will be assessed and disposed of as soon as practicable; and
- all vehicles entering and leaving the site must be clean and loads securely stowed, and covered where practicable.

Pest and Vermin Control

The following strategies will be followed to prevent attracting pests, vermin and disease vectors to the facility:

- waste receptacles and storage bins for organic and food wastes will be covered;
- No pooling or ponding will be allowed around storage areas;
- pest exterminators may be required periodically; and
- awareness training will be provided to staff and contractors.

Stormwater Management

Non-contaminated stormwater will be diverted from potentially contaminated areas.

All storage of hazardous and other chemical waste will be bunded.

Spill management procedures will be developed and implemented for the facility and spill kits provided.

A regular inspection of community waste storage areas will be completed by the Operator, or appointed representative. The inspection will assess housekeeping and ensure all drains are free of litter and operating at optimum efficiency.

Removal of Waste

All vehicles entering and leaving the site must be clean and loads securely stowed, and covered where practicable.

Copies of appropriate environmental licenses will be obtained from waste transporters and receiving disposal facilities prior to removal of any waste from the site. Copies of these records along with waste tracking documentation (as per section 4.1.2 and 4.2.2) will be retained by the Operator of the development and provided to the relevant regulatory authority upon request.

All wastes removed from the site will be recorded on a Waste Register Form, an example of which is provided in Appendix A of this WMTR. Wastes will only to be transported to recycling or disposal facilities licensed for the particular waste stream(s).

6.4 Performance Indicators

Visual inspection of the temporary waste compound and waste storage areas shall be undertaken on a daily basis during construction and weekly during operation. Evidence of waste spillage or dispersal shall indicate non-compliance with the objectives and the tasks/actions outlined in this WMP.

Visual inspection of stormwater treatment measures shall be undertaken on a daily basis during construction and weekly during operation. Evidence of stormwater blockage by wastes or pollution shall indicate non-compliance with the objectives and the tasks/actions outlined in this WMP.

No waste of any type shall be released from the development in an uncontrolled manner.

6.5 Frequency / Timelines

During construction, waste materials shall be transported from the temporary waste compound to the Waste Transfer Station at Caboolture landfill weekly to ensure that no spillage or dispersal of wastes occurs within construction working spaces. All waste storage bins shall be inspected daily by the site Contractor during construction to determine the need for additional removals to the disposal skip bin(s).

During operation in normal trading periods, waste shall be collected for disposal weekly by an appropriately licensed waste contractor, and additional services arranged if required. During operation in peak trading periods, waste collection may be required more frequently.

Visual inspections of waste storage areas and stormwater drains shall be undertaken by the Contractor on a daily basis during construction and by the Operator on a weekly basis during operation.

6.6 Responsibility

Construction

During construction, each Contractor will be responsible for all activities and identified impacts associated with the activities undertaken during their contract. All contractors will be responsible for reporting waste spillage and dispersal and cases of non-compliance to the Proponent.

All contractors will be responsible for ensuring that waste is disposed of as required. Contractors will be responsible for ensuring compliance of their own staff and will inform staff of the waste disposal facilities, separation methods and collection timetable. The Contractor will also be responsible for ensuring training and compliance of staff with this WMP and for reporting compliance or non-compliance to the Proponent.

During construction, the Proponent will be responsible for reviewing objectives and targets with regard to the rationale, ensuring that implementation measures are adequate to achieve the set objectives and targets and ensuring continual improvement of environmental performance.

Operation

During operation of the development, the Operator will be responsible for ensuring compliance with the requirements of this WMP and for continual improvement of waste management practices within the development.

Contractors employed by the Operator for site maintenance or further site development works will be responsible for ensuring that waste is disposed of as required during their contract.

Marina

During operation of the marina, the Marina Manager will be responsible for ensuring compliance with the requirements of this WMP and for continual improvement of waste management practices within the development.

6.7 Monitoring and Recording

The Contractor shall maintain records of waste streams during construction to be reviewed by regulatory authorities, if required. The Contractor shall monitor waste disposal and any spillage or dispersal of waste materials that may occur during their contract.

Spillage or dispersal of waste material occurring during construction will be immediately reported to the Proponent. In the event of non-compliance with this WMP, a review of the reasons for the failure will be undertaken and corrective measures will be implemented by the Contractor. Corrective measures may include provision of additional waste containers or increase in the frequency of waste collection.

If a spillage or dispersal of waste causes contamination on the site, the area affected by the spillage will be immediately remediated and contamination reported to the relevant authorities. At completion of construction, the Contractor shall review all construction areas and report to the Proponent that the WMP has been correctly administered and the site is free of waste materials.

In some instances, further investigation or monitoring may be required to establish whether the Contractor has failed to adequately implement the WMP, or has failed to comply with relevant legislation, guidelines and statutes. In these instances, an independent party such as a Consultant shall carry out the investigation or monitoring.

The Contractor shall monitoring waste performance against the measurable targets and objectives.

The Contractor shall periodically review incident reports to ensure implemented corrective actions have been effective.

6.8 Corrective Actions

A corrective request (CAR) form is to be completed and authorised where appropriate in general compliance with the CAR form provided in Appendix B of this WMTR. During Construction, the Contractor is required to maintain a register of CARs, which shall demonstrate that appropriate actions have been completed within a suitable timeframe.

Should there be non-compliance with the stated performance indicator the following corrective actions are to be implemented.

- Identification of the cause of the non-compliance;
- Implementation of appropriate mitigation measures as determined by the Contractor in consultation with the Consultant; and
- Relevant validation monitoring to confirm that the nominated corrective actions have been effective.

The Contractor shall implement the corrective action(s) as required within the agreed time frame noted on the CAR.

6.8.1 Incidents and Emergency Response

An emergency management plan will be developed for the following scenarios:

- Management of wastes during extreme weather or cyclonic condition.
- Spill and incident response procedures.

In the event that an environmental incident occurs the Contractor or Operator shall follow the response procedures outlined below.

- Make an assessment of any events that may be considered an environmental incident.
- The Contractor or Operator shall notify the Council and/or EPA of any incidents that have caused environmental harm.
- Complete an Environmental Incident Form and CAR for any environmental incidents.

Environmental monitoring may be required as part of the incident investigation and corrective action plan.

6.8.2 Complaints

The following procedure should be implemented in the event of receipt of a complaint, which relates directly to waste management.

- Complete a Complaint Register Form.
- Determine if the complaint is valid and if further action is required.
- Determine whether notification to the EPA is required.
- Notify the complainant within 24 hours advising of corrective actions that will be taken.
- If the issue cannot be investigated and finalised within 24 hours, then information regarding the preliminary assessment of the complaint and a date when a full response will be available shall be provided to the complainant within 24 hours.
- Ensure the complaint response is signed off indicating that it has been dealt with satisfactorily.

Environmental monitoring may be required as part of the complaint investigation and corrective action plan.

6.8.3 Audits

Waste audits should be undertaken of the construction works, including the waste storage and construction site compound during construction, as required. Regular audits of waste records should be undertaken annually to identify if additional waste avoidance, reduction, reuse or recycling measures can be achieved.

All issues identified in an audit are to be documented on a CAR.

FIGURES

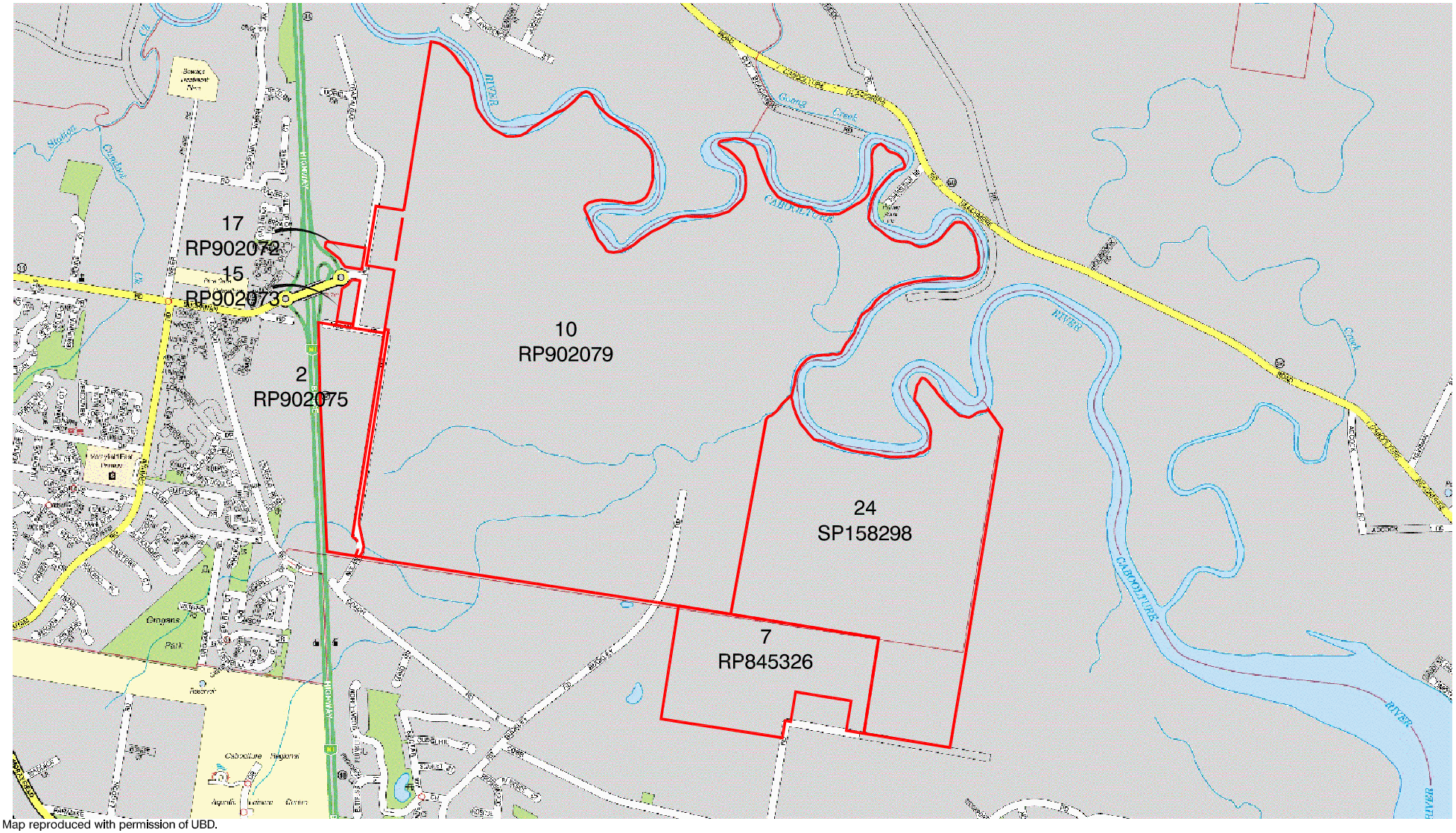

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FIGURE 1
LOCALITY PLAN

Rev: Orig. Date: 2 November 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\Waste Management Technical Report\Figure 1 - Locality Plan.dwg
XREF's: Caboolture_mga94

PRINT DATE: 22 November, 2007 - 6:44pm

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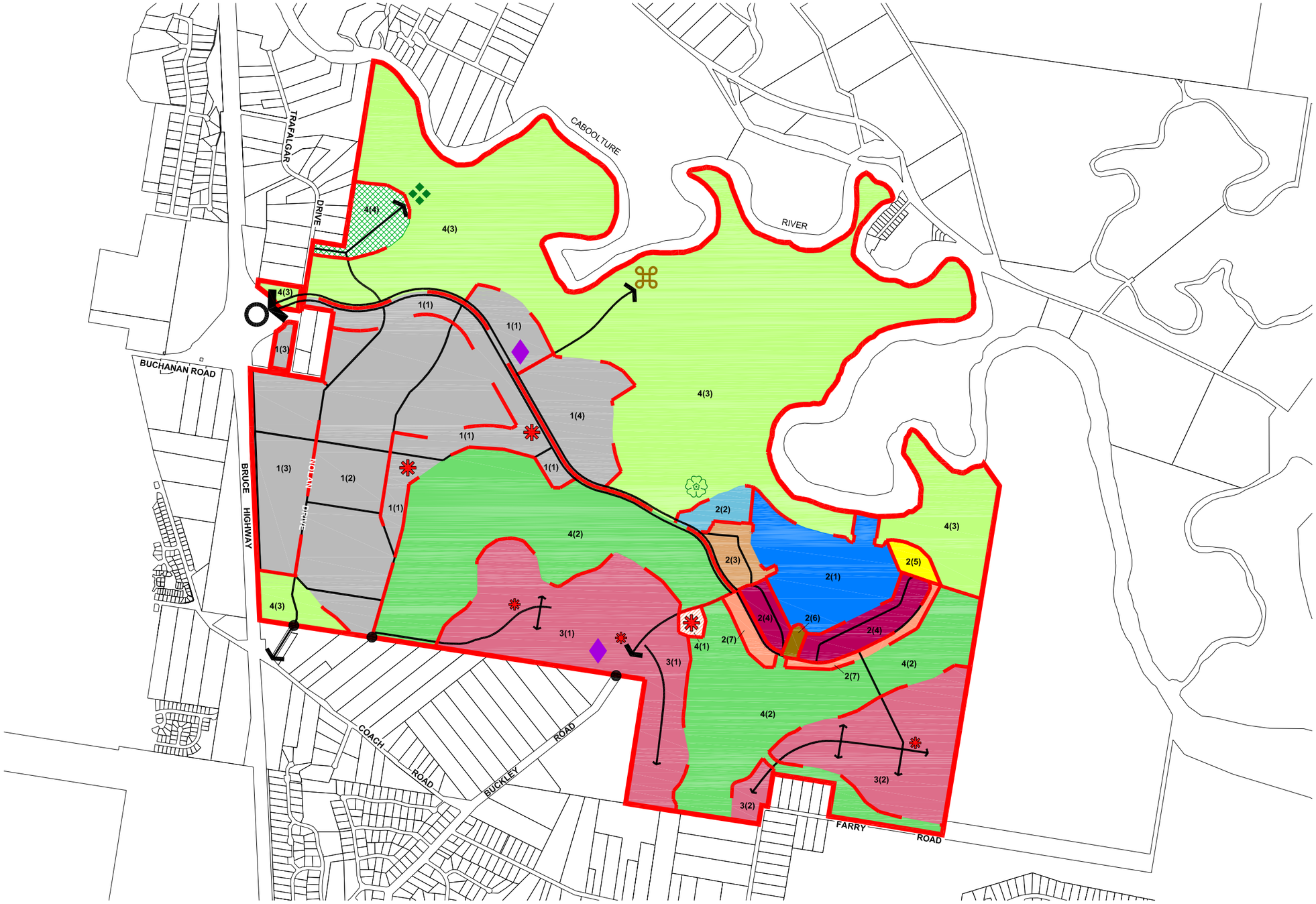

Plan sourced from PMM Brisbane Pty Ltd, Dwg name 20430STRUCTURE,
Plan Ref 20430-10F, 25 September 2007.

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FIGURE 2
PROPOSED DEVELOPMENT PLAN

Rev: Orig. Date: 2 November 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\Waste Management Technical Report\Figure 2 - Proposed Development Plan.dwg
XREF's:

PRINT DATE: 22 November, 2007 - 6:45pm

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FIGURE 3
CABOOLTURE LANDFILL LOCATION

Aerial image sourced from GoogleEarth, November 2007

Rev: Orig. Date: 2 NOVEMBER 2007

Project No.: 7800/40

Northeast Business Park Pty Ltd

CAD FILE: I:\7800-40\ACAD\Waste Management Technical Report\Figure 3 - Caboolture Landfill Location_v2.dwg
XREF's: Caboolture_mga94

PRINT DATE: 08 November, 2007 - 3:43pm

APPENDIX A

Waste Register Forms

Waste Register: Construction

Site Material		Destination		
		Reuse and Recycling		Disposal
Type of material	Estimated Volume (m^3)	On Site (Specify proposed reuse or on-site recycling methods)	Off Site (Specify contractor and recycling outlet)	Specify disposal facility
Fill and soil (not contaminated)				
Fill and soil (contaminated)				
Dredge spoil				
Tailwater from the dredge disposal area				
Acid Sulphate Soil				
Groundwater seepage during excavation				
Timber				
Vegetation				
Scrap metal				
Cable and wires				
Concrete, bricks, tiles and rubble				
Plasterboard				
Packaging materials (plastics, glass and timber)				

Domestic and general waste				
Organic and food waste				
Domestic wastewater				
Contaminated stormwater runoff				
Diesel and other fuels				
Paints and other chemicals				
Water collected in waste storage and bunded areas				

Waste Register: Operation

Site Material		Destination		
		Reuse and Recycling		Disposal
Type of material	Estimated Volume (m^3)	On Site (Specify proposed reuse or on-site recycling methods)	Off Site (Specify contractor and recycling outlet)	Specify disposal facility
Domestic and general waste				
Organic and food waste				
Maintenance dredge spoil and tailwaters				
Green waste				
Domestic wastewater				
Metals				
Plastics				
Glass				
Paper and cardboard				
Diesel and other fuels				
Hazardous and other chemicals				
Electrical and electronic equipment (E-waste)				
Waste by-products from the tertiary wastewater treatment plant				

Marine wastes (e.g. sewage ad bilge water pump out)				
Contaminated stormwater runoff				
Water collected in waste storage and bunded areas				

APPENDIX B

Corrective Action Request Form

CORRECTIVE ACTION REQUEST

Report no; .....

Date; .....

DETAILS OF NON-CONFORMANCE: Inspected by:
DETAILS OF PROPOSED ACTION Passed to the Principal (as applicable):y/n Date: Reply required by:
THE PRINCIPAL / COUNCIL ADVICE (as required): Date action required by (if applicable): Signed (by the Principal or the Principal's representative): Date:
AUTHORITY TO PROCEED Sign: Date:
ACTION CARRIED OUT Sign: Date:
ELEMENT RE-INSPECTED BY Sign: Date:
COPY ISSUED TO COUNCIL Date: Sign: