Taronga Conservation Society Australia

Operational Waste Management Plan
Upper Australia Precinct

Site Overview

Taronga Zoo is situated within a medium density populated urban locality on the northern side of the Sydney Harbour foreshore. Taronga is committed to ensuring that the Zoo's environment is managed safely and effectively so that it can be appreciated by both present and future generations of local and overseas guests.

Taronga's Sustainability Commitment and Waste Management Policy highlight the Zoo's commitment to the promotion of effective waste management on site. The policy also provides the framework for all Taronga employees and contractors to promote and conduct effective waste management practices within the workplace & the surrounding environment.

The Operational Waste Management Plan(OWMP) prescribed by this document relates specifically to the Upper Australia Precinct (Upper Australia). Once operational, Upper Australia will be promoted as the leader in the exhibit and presentation of Australian animals and provide an interactive and immersive experience for guests at Taronga Zoo.

This Operational Waste Management Plan relates specifically to the methodology for waste management of the Upper Australia Precinct post construction. The management of construction waste is described in *Construction Management Plan: State Significant Development Application - Upper Australia Precinct, Taronga Zoo* prepared by RPS (June 2020).

Service of the Upper Australia

To ensure the highest standards in waste management are achieved, Taronga has engaged the services of SUEZ Australia. The aim of the engagement is to increase the amount of waste diverted from landfill via processing through alternative waste recycling and treatment facilities. This practice is combined with the immediate capture through designated recycling receptacles on site for material that can be diverted directly into recycling from the generation point.

Suez uses only authorised and lawful landfill, transfer station, processing and recycling facility sites that have the approval of relevant Government authorities. Similarly, any organisation performing services for Suez on a subcontractor basis will only use authorised and lawful disposal sites that hold all of the required licences and compliance material. Suez has achieved ISO 14001 (Environmental Management) certification and AS 4801 (Occupational Health and Safety) at its operations across NSW, ACT, Queensland, Western Australia and South Australia.

Suez proactively advises and informs Taronga Zoo in respect of regulations and compliance, as well as the introduction of applicable new technology and practices relating to the processing and recycling of waste and residual materials generated by the Zoo.

Upper Australia will have the benefit of not being the recipient of a 'first time' application of the waste and recycling practices conducted on the Taronga site. Expanding the current service operation of Taronga to accommodate the additional requirements of Upper Australia will take full advantage of the existing in-house knowledge of both staff and the servicing contractor, SUEZ. Ideally this will see the adoption of the expanded service meld efficiently within the existing operation as well as evolving with new practices that may potentially be adopted by all recipients and participants in this activity.

Operational Plan Intent

The operational plan is structured in a manner to achieve the following targets and practices:

- Identification and quantification of projected waste generation;
- Identification and formation of an effective plan of management for generation points and access to waste generated;
- Provision of point of generation separation practices for waste material, where viable;
- Provision of sustainable practices in the collection, storage and transport of separated and residual materials;
- Provision of a safe work environment in all waste management practices;
- Establishment of baseline targets by waste type to periodically measure waste generation rates and diversion from landfill;
- Regular review of waste management KPIs to ensure continuous and sustainable improvement in the Zoo's OWMP.

The success of the operational plan will rely substantially on the partnership of all stakeholders. These individuals and teams will all need to be inducted and trained where necessary in the delivery of the waste management practices proposed. They include:

- Taronga Zoo operational staff;
- SUEZ service and operations staff;
- Waste and recycling facilities;
- Transporters and equipment providers; and
- Visitors, administrative staff, external contractors and other relevant stakeholders.

To ensure compliance with the OWMP it is critical that all of the above stakeholder groups are aware of their specific operational role in the Zoo's waste management plan. The level of success will be determined during scheduled reviews of the OWMP and issues will be considered and acted upon accordingly. This scheduled review will include the Taronga Manager Environmental Sustainability and a senior representative from SUEZ.

A table nominating specific individuals to be engaged in the Waste and Recycling review panel follows.

Contact name	Title	Contact
Rodd Stapley	Taronga Zoo Head of Asset Management	rstapley@zoo.nsw.gov.au
Bridget Corcoran	Taronga Manager Environmental Sustainability	bcorcoran@zoo.nsw.gov.au
Scott Bayliss	Suez Manager Sydney Branch	scott.bayliss@suez-env.com.au
Andrew Humphries	Suez Manager Sydney Operations	andrew.humphries@suez.com

Operational Plan

The intention of Upper Australia's OWMP is to incorporate waste generated from the facility into the existing waste and recycling service. Taronga's overall waste management operation is a daily service conducted 365 days per year and is inclusive of public holidays. Waste operators are scheduled for work daily on a rotating roster basis. It is the waste operator's responsibility to ensure that all waste management bins are serviced daily and all bins are placed on a bin washing schedule to maintain suitable levels of hygiene and to reduce the risk of unacceptable odours. Listed below is a ***Table 4.1*** outlining the Zoo's existing collection schedule which will also apply to Upper Australia's operations. For specific management of individual waste streams refer to Annexure 1.

Table 4.1 *SUEZ service schedule for key waste streams*

Item Collection	Collection Frequency
General Waste including H food organics waste	Daily (Mon – Sun), rear loader only travels to waste processing and recycling centre at full capacity
Cardboard and paper	Daily (Mon-Sun), Compactor only serviced when full
Compostable Packaging	
Fish waste from Great Southern Oceans exhibit	Once per week
BoH food organics waste	Twice per week
Animal Waste (manure, bedding)	Daily (Monday- Sunday)
Green waste	On call - when bin full
Metal	On call - when bin full

Waste Identification and Quantification

Table 4.2 indicates the typical waste profile that will be generated during normal operations.

Table 4.2 *Workspace, waste type and average quantity of waste material*

Workspace	Waste type	Bin Size	Collection frequency	Estimated quantity per week**
Nocturnal House including Back of House (BoH)	1. General waste 2. Comingled recyclables 3. Animal waste 4. Food organics from animal food prep.	240 litre (120L for food organics)	Daily	175 kgs

Macropod Back of House (BoH)	1. Animal waste 2. General waste 3. Comingled recyclables	240 litre / type	Daily	175 kgs
Koala (BOH)	1. Animal waste 2. General waste 3. Comingled recyclables	240 litre / type	Daily	175 kgs
Treehouse (Public Area Bins)	1. General waste 2. Comingled Recyclables 3. Compostable packaging	240 litre / type	Daily	175 kgs
Treehouse Food and Beverage Outlet (BoH)	1. General waste 2. Comingled Recyclables 3. Organics	240 litre / type (120L for food organics)	Daily	175 kgs
Koala talks (public area bins.)	1. General waste 2. Comingled Recyclables 3. Compostable packaging	240 litre / type	Daily	175 kgs
Sharps Sanitary	Allow for accessible public bathrooms (1) 1 x To public toilet cubicles	Sharps Bin	Daily	

****** *Quantity is an average projection in kilograms calculated over a seven day period. These projections may be further refined once staff and guest numbers have been finalised. Where there is a Co-mingled recyclable, Paper/cardboard & General waste service, this will be collectively known as an 'internal recycling station'.*

Waste management categories that will drive recycling and diversion from landfill

The material targeted for recycling or disposal has been listed in the following ***Table 4.3.*** Additional detail on the collection, transport and end-use for each material stream is described in Annexure 1.

Combined with the strategic deployment of bins will be signage on each bin that clearly indicates what may or may not be disposed within the nominated bin. Public facing bins at Taronga include best-practice signage developed alongside the NSW EPA and SUEZ, including colour coding and images as examples of what can go in each bin. Most public facing bins have covers, which feature cut outs shaped like the items which should go in, for example a bottle shaped cut out for the yellow commingled bin. Back of house (BoH) bins generally include signage or stickers in line with best practice also.

All bins are colour coded to comply with Australian Standards for mobile garbage bins. (i.e., general waste has a dark green or black body with a red lid whilst co-mingled recycling bins will have a dark green or black body with a yellow lid. The front of each bin and the waste management stations have a general waste or a recycling sticker with pictures of items to accommodate visitors who may be unable to read English or lack reading & literacy skills.

Table 4.3 *Indicates the typical colour coding of the bins that will be used for the Upper Australia for the various waste streams*

General waste (external)	Red lid, dark green or black base 240 litre bins
Co-mingled recyclables (external)	Yellow lid, dark green or black base 240 litre bins
Office recycle stations (internal)	Red lid, black base; yellow lid, black base; blue bin, black base 3 x 60L bins
Green waste	Green lid, dark green or black base 240 litre bins
Medical waste	Yellow 5L bin
Hazardous waste	Containerization will vary & be based on the specific hazard, refer Australian Dangerous Goods Code
Sharps	Yellow Approved single use containers
Cytotoxic waste	Purple 20 litre bins
Animal waste	Brown 120 or 240 litre bins
Paper & cardboard recyclables	Blue 240 litre bins Blue 1100 litre bins

For reference purposes photographs of the nominated bins have been displayed in ***Appendix 1****.*

Throughout its overall operations Taronga is striving towards a 90% diversion from landfill rate by 2020. Taronga achieved 90% diversion in 2018 but following the closure of the Camelia processing facility, separated organics from the mixed general waste stream could not be

diverted from landfill. As a result, Taronga's recycling rate was 77% in April 2020. Taronga is now working closely with Suez to find a recovery solution for the organics currently going to landfill.

Upper Australia will be striving towards a minimum of a 75% diversion rate to ensure that the 90% diversion rate is achieved. This is a conservative target and it is anticipated that a greater percentage of waste will be diverted from Upper Australia, in particular once all the waste system and processes are operational and subsequent to undertaking regular waste audit and education.

Additional practices that will assist in achieving the reduction targets will be the targeted procurement of products that are sustainably packaged and are recyclable. Taronga has initiated several projects aimed at reducing the consumption of single-use plastics on both zoo sites, for example in food and retail space. The target for zero single-use plastics given or sold to visitors by end of 2020 was established, and work was undertaken with suppliers to reduce plastic but also explore packaging and materials that are compostable, reusable or recyclable; and to eliminate unnecessary items that create litter such as straws. Taronga has also installed four 'Return and Earn' container collection points onsite, in cooperation with the NSW EPA container deposit scheme.

Broadly, the targets sought will align with the NSW EPA's 2014-2021 Waste Avoidance and Resource Recovery Strategy (WARR strategy). In accordance with this WARR strategy, the diversion targets from landfill for the waste profile generated at the Upper Australia are 90% by 2020.

Monitoring of the OWMP

To ensure efficient, responsible and sustainable waste management practices, Taronga Upper Australia employees will be allocated responsibility for regular monitoring the content of waste and recyclable materials being placed in bins. This will assist with target and KPI management and minimise the potential for contamination and inappropriate disposal activities. To accurately measure whether diversion targets are being met, Taronga's Manager Environmental Sustainability meets with SUEZ every month to evaluate waste tonnage data broken down by material streams, including overall percentage diversion from landfill. Taronga also performs an annual review alongside SUEZ to ensure contract KPIs are being met. If there is repeated contamination of material streams from Upper Australia, an audit can be performed to ascertain how the bin numbers, size, locations and/or empty frequency can be modified to ensure that diversion targets are being met.

To further reduce landfilling of waste generated, the service provider must- if available and if it is financially viable- propose lawful disposal alternatives that will offer additional diversion opportunities of waste materials to either re-use, processing and/or recycling.

Further to this, all waste management practices should be sustainable. That is, transport, processing and re-manufacture may actually consume more energy and create more pollution than traditional landfill disposal methods. Decisions should only be made after a full cost / benefit analysis has been undertaken.

In the event of any incident or emergency, it will need to be referred to and managed in accordance with the Taronga Zoo Emergency Response and Pollution Incident Response Management Plan.

Management of Generation points

SUEZ has worked with Taronga in finalising the location of the bins within the Development. The positions of bins have been illustrated in the Appendix 2. The bins have been positioned within a suitable proximity of the waste generation points (allowing for maximum waste capture, and minimising the risks of contamination and liability issues). The nominated positions of the bins allow for:

- Ease of access and the safe transfer of the bin to the designated collection point; and
- The need to minimise the risks associated with workplace injuries, public liability and containment.

Vehicle access and waste transfer

Four and one collection points have been allocated for General & Recycle Waste and Animal Waste respectively. These collection points, illustrated in Appendix 3, have been determined to ensure the minimal possibility of injury or spillage subject to the attached SWMS template in ***Annexure 3***. This SWMS has been specifically prepared for the work and will be distributed to the relevant stakeholders and training delivered during site induction and scheduled tool box meetings.

As is the case with the Zoo's current waste management collections, the waste management vehicles collecting from the zoos internal service roads will enter and exit via the Backyard to Bush Perimeter Fence Gate. After the collection of the waste from Upper Australia, all waste management vehicles will head to 'Styx Yard', the Taronga Zoo common waste storage zone, via Bradleys Head Road.

Review of the OWMP

This OWMP will be reviewed at the time which Taronga's waste service contract is renewed, approximately every five years.

Existing Waste Management Methodology

The following information outlines the existing waste management practices throughout the Taronga Zoo site. It is intended that the Upper Australia's waste management plan be incorporated into this existing scheme.

Bin stations

In front of house (public areas), Taronga has approximately 60 x 240 litre bins on site for general waste collection, 60 x 240 litre bins for compostable packaging, and 60 x 240 litre bins for FOH co-mingled recycling. These bins sit together at waste management stations (1 x recycling bin, 1 x compostable packaging bin and 1 x general waste bin). There are also 6 recycle stations within Taronga's Food Market (which is the primary food outlet on site).

In addition to the above Suez places general waste and recycling bins on site (as requested) for special events and concerts. Additional coverage of 240 litre bins are required to cover peak periods. These are requested from Suez as required.

Suez's collection activities extend to bin stations located at Athol Hall and the Ferry Wharf.

Animal Waste

Animal waste is collected in 240 litre bins, which are emptied each day into a mini rear-loader and stockpiled at Taronga's waste transfer area. There are approximately 120 animal waste bins located around the site at animal precincts (90 x 240L and 30 x 120L). Suez's staff will collect these bins each morning prior to the zoo's opening.

The material is transported to Suez's Organics processing facility at Lucas Heights where the material is blended with other products and processed into compost for re-use.

Compostable packaging

The food packaging, straws and coffee cups sold onsite are fully compostable so can be recovered in these bins. There are approximately 60 public facing (FoH) bins dedicated to compostable packaging that is sold onsite at Taronga's retail and food outlets. These bins are collected by Suez on a regular basis and transported to Lucas Heights facility to be blended with the animal waste stream to make compost for re-use.

Fish waste and BoH organics

Fish waste from the preparation of food for marine mammals is placed in 2 x 120L bins and emptied once per week by ORG. Back of house food organics (kitchens preparation waste, café food preparation waste, animal food preparation waste) is also collected in dedicated bins and transported offsite by ORG twice per week. Fish waste and BOH organics is transported by ORG to the Earthpower facility to be recovered as compost.

Co-mingled recyclables

Co-mingled recyclable bins are emptied into an $8m^3$ rear loading compaction vehicle. This material is then transported off site as required in full truck loads (variable based on Zoo patronage, each day in peak periods or 2 to 3 times per week in non-peak periods). Material is then sorted at the recycling facility to maximise the amount of recycling material.

Paper and Cardboard

Taronga Zoo's cardboard and paper is collected in separate blue bins and cardboard cages. The contents of the bins and cages are emptied daily into a 23 cubic metre on-site compactor. Once the compactor is full, the paper and cardboard is transported to either Visy Recycling or Orora Recycling (lawful recycling facilities).

Green waste

Material is collected by Taronga Zoo staff and placed into a dedicated skip bin. When full, this bin is then transported by SUEZ to the SUEZ's Ryde transfer station, where it is bulked up with other green waste and then transported by walking floor trailers to SUEZ's facility at Eastern Creek. There it is processed into a range of re-useable mulches and compost.

Bulk waste

Non-recyclable materials such as construction waste, timber off-cuts, broken equipment, miscellaneous materials, etc. are placed into a general waste bulk bin. When full, this bin is transported by SUEZ to SUEZ's Artarmon transfer station, where it is bulked up with other general waste products and transported to either of SUEZ's landfill sites at Eastern Creek or Lucas Heights.

Note –: any items that contain scrap metal or that are made of metal are placed in a dedicated scrap metal bin which is transported to a metal recycling facility when full.

Other waste types

- *Asbestos (Special waste as per NSW EPA classification system)*

Asbestos will be managed in accordance with *CWIO Asbestos Management Plan for Taronga Zoo*.

- *Clinical & related waste*

Clinical & related waste at Taronga Zoo is not managed by SUEZ. Taronga Zoo has engaged Daniels Health Pty Ltd (previously Sterihealth) to manage the waste from the Taronga Wildlife Hospital. Biological waste (such as animal tissue) is collected in appropriate containers and transported for disposal at the Daniels' clinical waste facility in Silverwater.

- *Grease Trap Waste*

SUEZ services the grease traps for both Taronga and Epicure Catering. The pits are serviced on a scheduled basis as determined by Sydney Water. The grease trap residue is transported by SUEZ in dedicated tankers to Earthpower for processing, recycling and disposal.

- *Other miscellaneous wastes*

From time-to-time, there may be the need for other specialised waste collections. In such cases SUEZ will assess and provide the Zoo with a proposal, prior to collection and transport of these waste products to an appropriate lawful facility.

- **Container Deposit Scheme (NSW)**

There are four Container Collection points at Taronga as part of the NSW Government Container Deposit Scheme (CDS). Three of these are Donation Stations that are located within the zoo grounds, and the 4th being a Reverse Vending Machine that is publicly accessible 24/7 outside of the zoo's secure perimeter.

Disposal bins provided by SUEZ

All waste and recycling activities are carried out in accordance with the guidelines and laws of the NSW EPA. In all cases only lawful and approved waste facilities are utilised.

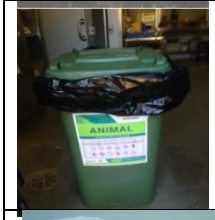
Transfer area

1. Animal Waste - 2 x 5 cubic metre bins
2. Steel - 1 x 23 cubic metres
3. Bulk waste - 1 x 23 cubic metres
4. Green Waste - 1 x 23 cubic metres
5. Cardboard Compactor - 23 cubic metres
6. 100 x spare 240 litre bins as spares and for change over purposes

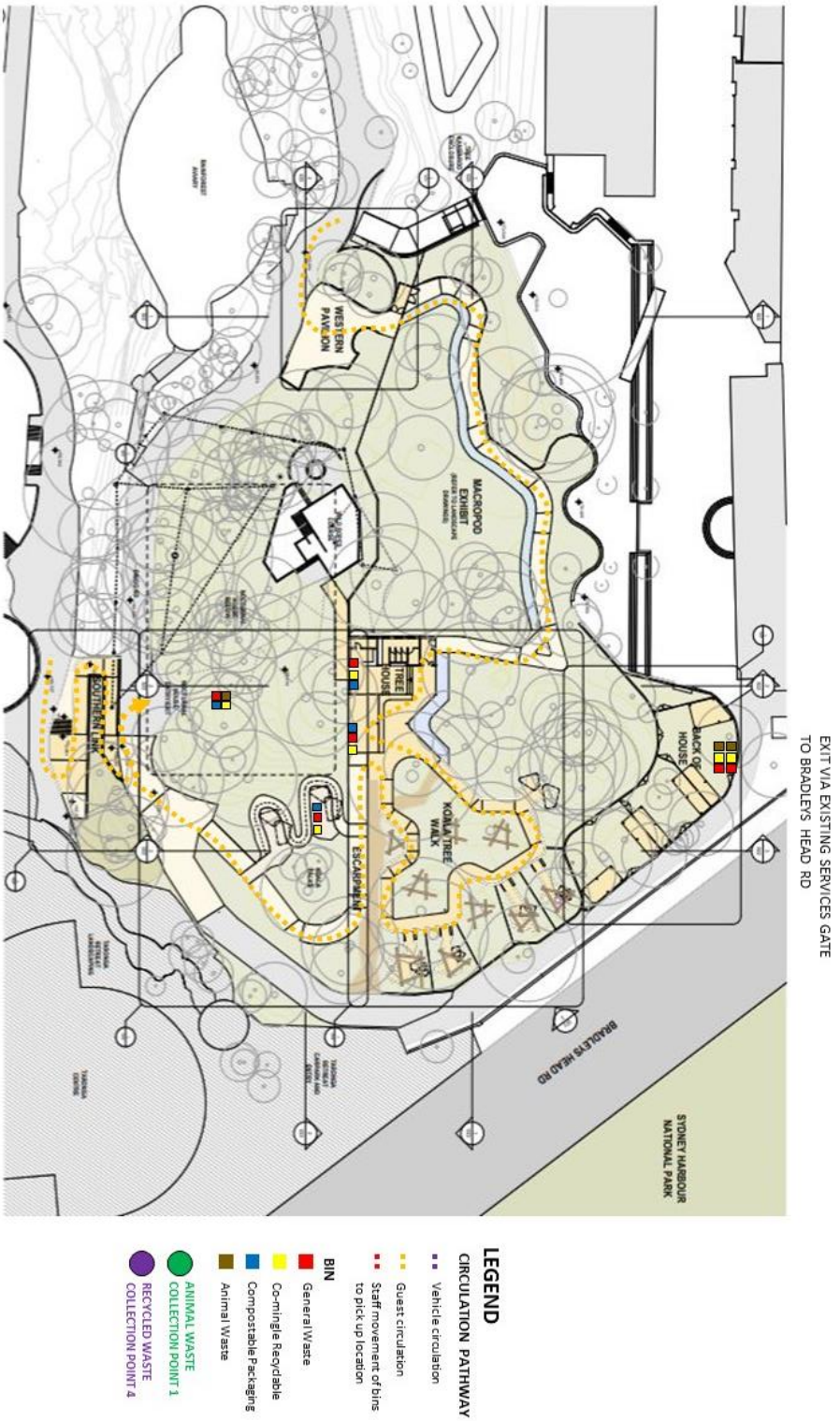
Transport vehicles

1. 1 x 2 tonne Pantech truck with tail gate
2. 1 x small hook lift truck
3. 3 x 8m³ rear load trucks

APPENDIX 1 : (BIN TYPES NOMINATED IN TABLE 4.2)

Image	Waste stream
 	Paper / cardboard - 120 lt blue bin Secure - 240 lt blue bin yellow lid
	**Office Space – recycle station** Recyclables- 60Lt bin – yellow lid Paper/cardboard – 60Lt blue lid General waste – 60lt red lid
	**Public Space - recycle station** General waste -240 Lt bin Recyclables – 240 Lt bin
 	Animal and green waste - 240Lt bin
	Biological waste – 240 Lt bin
	Medical sharps waste -5L

APPENDIX 2 : GENERAL BIN LAYOUT



APPENDIX 3 : WASTE COLLECTION POINTS AND MOVEMENT PATHWAYS