

Waste Management Plan

Document Administration

Version History

Version	Date	Issued to	Remarks
1.0	7 April 2021	Ethos Urban Health Infrastructure	Final

Document Control

File location: https://Tsamanagement.Sharepoint.Com/Sites/JHHIP/Shared Documents/B PM/05 Authorities/01 Town Planning/04 SSDA - SINGLE/02 WORKING CONTENT/WMP/210407_JHHIP WMP V1.0.Docx

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1. Purpose

The Waste Management Plan (WMP) has been prepared to support the John Hunter Health and Innovation Precinct (JHHIP) State Significant Development (SSD) application.

The Works will be undertaken by a Principal Contractor. All statements and proposals documented in this WMP are a guide only. At the time of contract award, the Contractor(s) will formulate their own WMP for the Works and ensure alignment with the legislation, health services requirements and project requirements. This WMP will be replaced by the Contractor's WMP once appointed.

The development application pathway for the JHHIP Project will consist of a State Significant Development Application (SSDA) pursuant to section 4.12(8) of the EPA Act.

This report will address the SEARs requirements as detailed in the table below:

Table 1: SEARS requirement

Item	SEARS Requirement	Relevant Section of Report
23	Waste	
	Identify, quantify and classify the likely waste streams to be generated during construction and operation	4.6 and 5.2
	Describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste	4.4, 4.9, 4.10 and 5.4
	Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site	5.1, 5.3, 5.4

2. Introduction

2.1 Overview

An Environmental Impact Statement (EIS) has been prepared to accompany an SSD Application which will be assessed pursuant to section 4.12(8) of the EPA Act. The project has been established based on the following supporting documentation:

- JHHIP Masterplan
- JHHIP Preliminary Business Case
- JHHIP Schematic Design

In June 2019, the NSW Government announced a significant expansion of the John Hunter and John Hunter Children's Hospitals with the \$780 million John Hunter Health and Innovation Precinct (JHHIP) project.

The JHHIP will transform healthcare services for Newcastle, the greater Hunter region and northern NSW communities. The infrastructure will provide additional inpatient capacity to the John Hunter and John Hunter Children's Hospitals and create further opportunities for partnerships with industry and higher education providers.

The JHHIP will deliver an innovative and integrated precinct with industry-leading facilities working in collaboration with health, education and research partners to meet the current and future needs of the Greater Newcastle, Hunter New England and Northern NSW regions.

The John Hunter Health and Innovation Precinct Project is being planned and designed with ongoing communication and engagement with clinical staff, operational staff, the community and other key stakeholders with a strong focus on the following:

- Patient-centred care
- Contemporary models of care
- Future economic, health and innovation development opportunities
- Environmental sustainability

2.2 Subject Site

The John Hunter Health Campus (JHHC) is located on Lookout Road, Lambton Heights, within the City of Newcastle Local Government Area (LGA), approximately 8km west of the Newcastle CBD. The hospital campus is located approximately 3.5km north of Kotara railway station.

The JHHC comprises the John Hunter Hospital (JHH), John Hunter Children's Hospital (JHCH), Royal Newcastle Centre (RNC), the Rankin Park Rehabilitation Unit and the Nexus Unit (Children & Adolescent Mental Health Unit). JHHC is a Level 6 Principal Referral Hospital, providing the clinical hub for medical, surgical, child and maternity services within the Hunter New England Local Health District (HNELHD) and across northern NSW through established referral networks. Other services at the campus are the Hunter Medical Research Institute (HMRI), Newcastle Private Hospital and the HNELHD Headquarters.

2.3 SSDA Proposal

Approval is being sought for a new Acute Services Building and refurbishment of existing hospital facilities at John Hunter Hospital comprising:

- Construction and operation of a new seven-storey Acute Services Building (plus 4 semi-basement levels) to provide:
 - an expanded and enhanced Emergency Department;
 - expanded and enhanced medical imaging services;

- expanded and enhanced intensive care services - Adult, Paediatric and Neonatal;
- expanded and enhanced Operating Theatres including Interventional Suites;
- an expanded Clinical Sterilising Department;
- Women's Services including Birthing Unit, Day Assessment Unit and Inpatient Units;
- integrated flexible education and teaching spaces;
- expanded support services;
- associated retail spaces;
- new rooftop helipads;
- new semi-basement car parking;
- Refurbishment of existing buildings to provide:
 - additional Inpatient Units;
 - expanded support services;
- A new Hospital entry canopy and works to the existing drop off;
- Link bridge to the Hunter Medical Research Institute (HMRI);
- Campus wayfinding and signage;
- Landscape works;
- Site preparation including bulk earthworks, tree removal, environmental clearing, cut and fill;
- Mines grouting remediation works;
- Construction of internal roads network and construction access roads and works to existing at-grade carparking;
- Connection to the future Newcastle Inner City Bypass; and
- Inground building services works and utility adjustments.

A detailed project description and architectural plans are as part of the Environmental Impact Statement (EIS) for reference.

3. Legislative Requirements

The Works will be undertaken in accordance with the following legislative requirements relevant to the management of waste in New South Wales, and any others that must be complied with in carrying out the works as required:

- NSW Health – Waste Reduction and Purchasing Policy 2011-2014
- Waste Management Guidelines for Health Care Facilities
- NSW Occupational Health and Safety Act (2000)
- NSW OH&S Regulation (2001)
- Protection of the Environment Operations Act and Regulation
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)
- Waste Avoidance and Resource Recovery Act
- Contaminated Land Management Act
- NSW EPA, 2014 – Waste Classification Guidelines

- NSW EPA, 2014 – The Excavated Natural Material Order
- NSW EPA, 2014 – The Excavated Public Road Material Order and The Reclaimed Asphalt Pavement Order
- NSW WorkCover, 2011 – How to Safely Remove Asbestos Code of Practice
- Australian Code for the Transport of Dangerous Goods by Road and Rail
- AS/NZS 4031:1992 (Non-reusable containers for the collection of sharp medical items used in health care areas)
- AS/NZS 4261:1994 (Reusable containers for the collection of sharp items used in human and animal medical applications)
- AS/NZS 3816:1998 (Management of clinical and related waste)
- AS/NZS 2161.10 Parts 1-3:2005 (Occupational protective gloves)
- AS/NZS 4123 Parts 1-7:2008 (Mobile waste containers)
- AS/NZS 2243 Part 3:2010 (Safety in Laboratories)
- RPS No.20 Safety Guide for Classification of Radioactive Waste (ARPANSA, 2010)
- Code for the Safe Transport of Radioactive Material (ARPANSA, 2014)
- Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (RPS14) (ARPANSA, 2008)
- Industry Code of Practice for the Management of Biohazardous Waste (including Clinical & Related Wastes) (WMAA, 2014)
- The Australian Council on Healthcare Standards (ACHS) EQUIPNational Guidelines Standard 15 (ACHS, 2012)
- Labelling of workplace hazardous chemicals Code of Practice (SafeWork NSW, 2016)
- Code of Practice: Hazardous manual tasks (SafeWork NSW, 2016)
- PD2008_004 Community Sharps Disposal by Area Health Services
- PD2013_043 Medication Handling in NSW Public Health Facilities
- Guideline for Approval of Method to Treat Clinical Waste
- PD2017_013 Infection Prevention and Control Policy
- PD2017_010 HIV, Hepatitis B and Hepatitis C - Management of Health Care Workers Potentially Exposed
- PD2007_052 Sharps Injuries - Prevention in the NSW Public Health System
- PD2012_061 Environmental Cleaning Policy
- Infection prevention and control practice handbook. Principles for NSW public health organisations (CEC, 2016)
- Environmental Cleaning Standard Operating Procedures. Module 3.4 Environment (CEC-HAI, 2012)
- Environmental Cleaning Standard Operating Procedures. Module 6 Cleaning Agents (CEC-HAI, 2012)
- Environmentally Hazardous Chemicals Act 1985
- Environmentally Hazardous Chemicals Regulation 2017
- Protection of the Environment Administration Act and Regulations
- Code of Practice for the Safe Removal of Asbestos (NOHSC:2002 (2005))
- Guide to the Control of Asbestos Hazards in Buildings and Structures (NOHSC:3002 (1998))
- Resource and Recovery Act 2001
- Environmental Planning and Assessment Act 1979
- Local Government Act 1993
- Soil Conservation Act 1938

4. Waste Management Principles - Construction

4.1 Waste Management Principles

In accordance with NSW Health requirements for health care facilities, a detailed WMP will be developed by the Principal Contractor providing detailed information regarding the nature and volume of waste generated by the development and the means of storage and disposal of waste from the site. Waste management practices will adopt the waste hierarchy established by the Waste Avoidance and Resource Recovery Act 2001 (WARR Act) of reduce, reuse, recycle, treat and dispose.



Figure 1 Waste Hierarchy (NSW, EPA 2017)

The major components of the waste management system will include:

- Avoidance and Reduction of Waste
- Recycling and Reuse
- Segregation at the source
- Waste streams
- Handling and Storage
- Waste treatment
- Waste disposal

The Works will be undertaken by a Principal Contractor. All statements and proposals documented in this WMP are a guide only. At the time of contract award, the Contractor(s) will formulate their own WMP for the Works and ensure alignment with the legislation, health services requirements and project requirements. This WMP will be replaced by the Contractor's WMP once appointed.

4.2 Waste Estimation

Indicative quantities of waste likely to be generated during construction have been set out per the below assumptions. This will be developed in further detail by the Principal Contractor. It is expected that actual waste quantities and composition will vary depending on outcomes of detailed design, materials specification and construction planning and methods.

The quantities of waste likely to be generated during demolition have been calculated based on benchmarks provided by the UK Building Research Establishment (BRE) (refer Table 2) and benchmarked data of waste composition developed by Sustainability Victoria (refer Table 3).

Table 2: Average Volumes of Waste Produced by Different Project Types

Project Type	Average volume (m ³) of waste per 100m ²
Residential	18.1
Public buildings	20.9
Leisure	14.4
Industrial Buildings	13.0
Healthcare	19.1
Education	20.7
Commercial Other	17.4
Commercial Offices	19.8
Commercial Retail	20.9

Source: BRE (2012)

Table 3: Guide to Waste Composition and Volumes - Construction

Material	Estimated Waste %	Conversion Factor (Density) (Tonne per m ³)
Hard material	32%	1.2
Timber	24%	0.3
Plastics	15%	0.13
Cement sheet	9%	0.5
Gypsum material	6%	0.2
Metals	6%	0.9
Paper / card	4%	0.1
Vegetation	3%	0.15
Soil	1%	1.6
Other	0.3%	0.3

Source: Sustainability Victoria Waste Wise Tool Kit (2013)

Table 4: Likely Waste Quantities During Construction

Material	Average Volume/ 100m ²	Total (m ³)	Total (Tonnes)
Hard material (32%)	6.1	3599	4318.8
Timber (24%)	4.6	2714	814.2
Plastics (15%)	2.9	1711	222.43
Cement sheet (9%)	1.7	1003	501.5
Gypsum material (6%)	1.1	649	129.8
Metals (6%)	1.1	649	584.1
Paper / card (4%)	0.8	472	47.2
Vegetation (3%)	0.6	354	53.1
Soil (1%)	0.2	118	188.8
Other (0.3%)	0.1	59	17.7
Total	19.1	11,328	6,877.63

Strategies will be implemented to minimise waste generation and maximise reuse and recycling.

4.3 Waste Avoidance and Reduction

The most effective strategy in the waste hierarchy is to avoid the generation of waste. Throughout both the construction and operational phase of the Project, the avoidance of waste can be achieved through a number of strategies, including but not limited to:

- Reducing materials brought to site through a thorough understanding of the design, operational requirements, required quantities and detailed project planning; and
- Inventory control, proper storage and management of materials to avoid waste from materials that are out of date or off specification and reducing the need to reorder supplies.
- Appropriate Storage and Management of materials onsite to limit the potential for damage from weather or plant which will eliminate the need for purchase of replacement products and waste generation.

4.4 Waste Recycling and Reuse

Where the generation of waste cannot be avoided, it is encouraged to promote the reuse and recycling of waste materials. This can be achieved through a variety of strategies, including but not limited to:

- Evaluating waste production processes and identifying potentially recyclable materials;
- Identifying and recycling products that can be reintroduced into the construction and operation processes;
- Separating and segregating waste, particularly recyclable material from non-recyclable;
- Proper disposal of recyclable waste such as glass, paper and aluminium; and
- Where possible, reusing materials and equipment in later stages of the construction phase and/or in different projects. For example, classifying excavated material as Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM) to allow potential reuse off-site

The contractor's WMP will address recycling targets and monitoring strategies to enabling monthly reporting on the recycling outputs.

4.5 Waste Segregation

Segregation of various streams of waste is an important part of efficient waste management. Where possible, waste such as excavated material will be separated on-site into dedicated bins and areas for reuse and/or collection by a licensed contractor:

- General Waste – Glass, Paper & Cardboard and Aluminium
- Natural material will be classified as VENM for reuse onsite where possible or for offsite reuse.
- Excavated material (unable to be used onsite) to be sent to a recycling facility
- Waste from piling works, including waste steel and formwork

If separation is not possible on-site, the Contractor(s) shall organise the separation of waste off-site. Waste will be classified in accordance with the requirements of the NSW EPA (2014) Waste Classification Guidelines.

4.6 Waste Streaming

Throughout the construction phase of the Project, organic waste that is biodegradable will be recycled where possible. Uses of organic waste include, but are not limited to, mulch or garden compost to enhance lawns and gardens. Where reuse is not possible, organic waste will be placed in mobile bins for regular collection by a licensed contractor.

Domestic wastes such as non-biodegradable food scraps, bottles, cans and packaging – will be segregated into recyclables and non-recyclables at point of generation and collected by a licensed contractor.

4.7 Waste Handling and Storage

The Contractors WMP will identify storage and collection areas including loading zones and stockpile locations. Storage locations of waste will be planned to consider the changing nature of the site and construction phases. Clear signage will be provided to mark the location of different types of waste and materials.

Stockpile management strategies include, but are not limited to:

- Locating stockpiles in designated, marked areas and away from drainage lines and up-slope of sediment barriers;
- Locating stockpiles on hardstand surfaces or on plastic sheeting, and covering stockpiles or stabilising surfaces to reduce erosion; and
- Maximum stockpile height of 2 m (subject to Engineering advice).

Where applicable, liquid wastes will be stored in bunded areas protected from the weather. Containers will be labelled with name of the waste stream, composition and physical state, restricted properties and date of storage to ensure safe handling and management procedures are met.

Clearly marked waste containers with information such as name of waste, composition (solid/liquid), restricted properties of the waste (corrosive, ignitable) and date of the first waste deposited into the container.

All servicing arrangements will need to consider the safety of site users.

The Contractor shall ensure that the supply chain is responsible and accountable for maintaining a clean, clear and safe working environment. Rubbish bins should be provided to all work areas and be regularly removed to the central skip bin location for collection and transport from site to a waste recycle facility.

4.8 Waste Treatment

It is intended that no waste is treated on-site. Treatment of construction and general waste will be performed by a licensed contractor after proper removal of waste off the project site.

4.9 Waste Disposal and Transport

Waste that cannot be recycled and/or reused will be disposed off-site by a licensed contractor to a licensed landfill or recycling facility.

Prior to disposal, waste will be classified in accordance with the requirements of the NSW EPA Waste Classification Guidelines.

All vehicles transporting waste off-site will have covered loads. A waste tracking record will be maintained of all disposals that records the waste facility name and address, type and identity of disposal vehicle, date of disposal, type and quantity of waste and method of treatment (where applicable). Contractor(s) will keep evidence of the proper disposal of waste to licensed facilities.

All vegetation and topsoil will be assessed for site suitability.

4.10 Waste Management Methods

A detailed construction waste management plan will be developed by the Contractor. The plan will provide further details of the management required for the waste types generated under the works associated with the JHHIP Development.

As the design progresses, accurate estimates of quantities of building materials prior to construction will ensure that a minimum of waste is generated. Records of waste and recycling collected and disposed of will be collated throughout the construction phase by the Contractor. Unused materials in a good condition will often be collected by suppliers, facilitating the reduction of the amount of material sent to recyclers or landfill.

The Contractor will be required to achieve compliance with the EPA guidelines.

A summary of likely waste streams to be generated through Enabling Works construction are identified in the table below, a proposed method for handling, storage and reuse/disposal of each type of waste are also presented.

Table 5: Likely Waste Streams

Activity	Waste stream	Management
Site Clearing - Green Waste	Trees, shrubs, groundcover and weeds	<ul style="list-style-type: none"> Reuse suitable material for mulch if it is weed free and complies with the EPA mulch exemption Potential for offsite reuse or disposal to a green waste facility
Construction Waste	Concrete, metal, steel, timber, fittings, plastic, electrical and plumbing	<ul style="list-style-type: none"> Segregation of recyclable wastes and storage onsite (within construction compounds) Collection and transport to appropriate recycling facility
Site Office and Worksites	General Office Waste – paper, printer cartridges	<ul style="list-style-type: none"> Segregation of recyclable wastes and storage on-site Collection and transport to a recycler
	Domestic Wastes – food scraps, glass bottles, cans, packaging.	<ul style="list-style-type: none"> Segregation of recyclable wastes and storage onsite
	Septic and Sanitary systems waste	<ul style="list-style-type: none"> Sewerage treatment plant

Activity	Waste stream	Management
Plant Maintenance and Chemicals Management	Drums and Containers	<ul style="list-style-type: none"> • Segregation of recyclable wastes and storage onsite (within construction compounds) • Collection and transport to a recycling facility
	Waste Oil, great, lubricants, oily rags and filters	<ul style="list-style-type: none"> • Segregation of recyclable wastes and storage onsite (within construction compounds) • Collection and transport to a recycling facility

The storage of waste created by the site through demolition, excavation and general construction works will be specified within the site establishment zones in the Principal Contractor's Construction Management Plan.

5. Responsibilities and Training

5.1 Roles and Responsibilities

The Principal Contractor will be responsible for developing a detailed waste management plan prior to commencement of the construction works. That plan must be consistent with the approach, principles and management methods outlined in this plan.

The Contractor will also be responsible for:

- Inducting all contractors and visitors about the relevant aspects of this plan.
- Ensuring all waste management contractors have the necessary qualifications and licenses to remove waste from the site.
- Carrying out periodic audits to check compliance with the waste management plan.

5.2 Training and Induction

During construction, all site personnel and subcontractors will be inducted into the requirements of this plan in accordance to their level of responsibility. As such, the induction is expected to include the following components:

- The waste hierarchy and associated waste management principles (avoid, reuse, and recycle).
- NSW EPA Waste Classification Guidelines.
- Procedures for handling and storage of wastes.
- Location of waste disposal and storage facilities.
- Actions to be undertaken in the event of a hazardous material spill.

Staff and contractors with specific responsibilities for waste management including for the handling and disposal of hazardous waste will be given additional training as required.

6. Waste Management Principles - Operation

6.1 Waste Management Plan - Operation

Hunter New England Local Health District (HNELHD) have an Environmental and Waste Management Plan in place for existing John Hunter facilities including the John Hunter Hospital (JHH), based on the following policies:

- NSW Health PD2017_026 Clinical and Related Waste Management for Health Services
- NSW Health Guideline GL2016_025 NSW Government Resource Efficiency Policy (GREP)
- NSW Health Policy Directive PD 2017_013 Infection Prevention and Control Policy
- Work Health and Safety Act 2011 No. 10
- Work Health and Safety Regulation 2011
- Relevant State and National Legislation and policy relevant to clinical and related waste

As design progresses for the Project, the existing HNELHD Environmental and Waste Management Plan for John Hunter Facilities will be updated to ensure ongoing improvements and compliance with policy and legislation in all aspects of waste management, including generation, handling, storage and disposal of all forms of waste.

6.2 Waste Streams

The Project is benchmarking to 5-star Green Star – Design & As Built v1.3 and proposing initiatives within the design to provide adequate provisions to enable waste stream separation and reduction of waste sent to landfill.

ARUP were engaged in Q1 2021 to undertake a logistics review for JHHIP, informed by the existing state of JHH. The following operational waste streams and estimated quantities have been developed as outputs of this review:

Table 6: Medical Waste Generation

Waste Stream	Collection Frequency	JHH Waste Generation (kg/ day)	ASB Waste Generation (kg/ day)	Total (JHH + ASB) Medical Waste generation (kg/ day)
Clinical Waste	Daily	589	248	836
Pharmaceutical	2 x week	6	2	8
Cytotoxic	3 x week	46	20	66

Table 7: Non-Medical Waste Generation – Compactors

Waste Stream	Collection Frequency	JHH Waste Generation (tonnes/ day)	ASB Waste Generation (tonnes/ day)	Total (JHH + ASB) Medical Waste generation (tonnes/ day)
General Waste	2 x week	1.9	0.8	2.7
Cardboard	2 x week	0.9	0.4	1.3

Table 8: Non-Medical Waste Generation – Mobile Garbage Bin

Waste Stream	Collection Frequency	JHH Waste Generation (kg/ day)	ASB Waste Generation (kg/ day)	Total (JHH + ASB) Medical Waste generation (kg/ day)
Secure Waste	3 x week	111	47	158
Paper Recycling	2 x week	27	11	39
Organics	Daily	658	277	935
Comingled Recyclables	Daily	820	345	1165

6.3 Servicing Arrangements

The existing loading dock located in the JHH and servicing the John Hunter Health Campus (JHHC) will be maintained for JHHIP and will service the ASB. It is proposed that medical and non-medical waste from the JHH and the ASB will be collected from the loading dock under the operating model shown in Figure 2 below. Medical waste includes clinical sharps, clinical waste, pharmaceutical waste and cytotoxic waste. Non-medicate waste includes general waste, cardboard, secure waste, paper recycling, organics, and comingled recyclables.

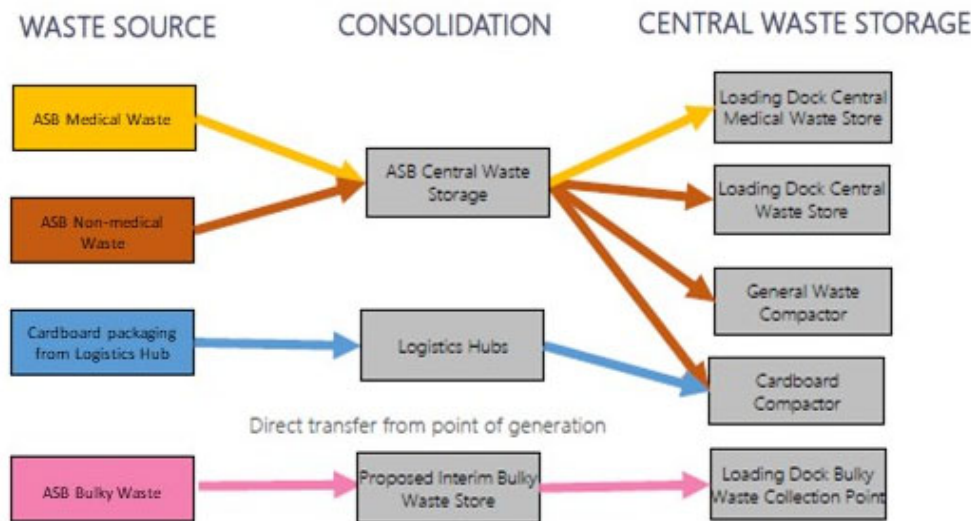


Figure 2 Proposed consolidation and waste storage areas

The major waste transfer routes are shown in Figure 3 below. The ASB Central Waste area will allow for consolidation of waste from the ASB prior to transfer to the Loading Dock Central Waste Store located within the existing JHH.

It is proposed that the medical and non-medical waste will be stored in disposal rooms in close proximity to the back of house lifts prior to transfer to the ASB Central Waste Storage. The existing arrangement for JHH is that anatomical and nuclear waste is managed and stored at the mortuary and collected from the mortuary loading dock. There is no change to this existing arrangement and is expected to continue after the construction of the ASB.



Loading Dock Central
Waste Store

HNELHD manages waste in accordance with its Environmental and Waste Management Plan which includes the following principles for the safe management of waste:

- Management of Clinical Waste Streams will be in compliance with NSW Health PD2017_026 Clinical and Related Waste Management for Health Services.

6.5 Waste Minimisation Strategies

- Reduction, through product substitution, product modifications and procedural change; buy less and use less
- Re-use, where clinically appropriate, environmentally sound, practical and cost effective to do so. Items that were packaged as single-use should never be re-used

Recycling, through the appropriate streams and through increased volumes of current recycling and assessment of additional resource recovery programs for implementation.

The Plan also outlines the following waste minimisation strategies applied by staff across the existing facility:

- Setting printers to default to double sided printing
- Intranet and electronic storage and distribution of documents to reduce paper copies
- Recycling of paper and cardboard
- Toner cartridge collection
- Mobile phone collection
- Battery recycling
- Use paper with a percentage of recycled material
- Increase use of recycled stationery such as notebooks and envelopes
- Increase staff awareness in relation to reducing energy consumption and use of recycled products

Best for Project

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