



Waste Management Services Strategy

2018—2027

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Acronyms and Definitions

ARRF Advanced Resource Recovery Facility: A facility where organic and non-organic residential and commercial waste is received and sorted via the 'Bedminster' technology to produce a compost.

C & D Construction and Demolition Waste: Waste resulting from the construction, demolition, alteration or building of man-made structures. Often contains building rubble, bricks, pavers, concrete without with-out reinforcing bars, timber, plasterboards etc.

C & I Commercial and Industrial waste; General waste from commercial and industrial sources. May contain putrescibles, packaging, dry bulky waste, recyclables etc.

CRP Container Refund Point where eligible containers can be presented by the public for a monetary refund (see s 99K *Waste Reduction and Recycling Act*).

CRS Container Refund Scheme: A Queensland Government initiative aimed at reducing beverage container litter, which provides an incentivised scheme for the public to return eligible used beverage containers in exchange for a 10c refund.

Designated Benefitted Area : Areas designated by local government under the *Waste Reduction and Recycling Regulation 2011* or local law to receive a kerbside collection that is administered by the local government.

DES Department of Environment and Science: Queensland government department responsible for administering the *Environmental Protection Act 1994*, under which waste facilities including landfills and waste transfer stations require approval.

ERA(s) Environmentally Relevant Activities: Activities such as industrial processes or intensive agricultural activities with the potential to release emissions which impact on the environment and surrounding land uses. They are scheduled in *Environmental Protection Regulation 2008* and an Environmental Authority is required to conduct these activities.

FNQROC Far North Queensland Region of Councils: An organisation representing 13 member Councils from Hinchinbrook, north to Cook and west to Carpentaria in Far North Queensland.

LAWMAC Local Authority Waste Management Advisory Committee: An organisation of nineteen north Queensland councils dedicated to best practice waste management. LAWMAC aims to provide sustainable solutions through its regional forum and interactive participation across the region on current and future waste management practices and technologies.

MGB Mobile Garbage Bin: In this strategy, MGB refers to a 240L wheeled bin

MRF Materials Recovery Facility: A facility designed to sort and separate recyclable commodities through a combination of manual and mechanical processes. Plastics, steel, and aluminium are baled and are transported to Brisbane for recycling processes.

MSC Mareeba Shire Council

MSW Municipal Solid Waste: Waste produced primarily by households and similar residential properties, including recyclable and non-recyclable material.

Organic Waste Any waste that is of biological origin and has carbon content, and that can break down.

WDA Waste Disposal Agreement: A contract that sees any untreatable process waste from the ARRF returned to Mareeba for landfilling

WTS(s) Waste Transfer Station(s): A facility used for the temporary sorting, handling, and storage of waste prior to transport for final disposal or recycling.

1396 Contract MSC is party to the Waste Management Contract (no.1396) where kerbside collection rubbish combined with putrescible rubbish from waste transfer stations is delivered to the ARRF for processing. Douglas Shire and Cairns Regional Councils also participate in this contract with SUEZ. Cairns Regional Council administers the contract.



Figure 1 A Mareeba resident recycling

Executive Summary

Mareeba Shire Council (MSC) provides local government waste management services for a geographically dispersed population of 21,557 (ABS, 2018) persons through a mix of kerbside collection services, and the operation of waste transfer stations and landfills.

To enable a growing, confident and sustainable shire, a Waste Strategy (the Strategy) is required to strategically manage the community's waste, enhance liveability and proactively mitigate against inappropriate waste management. This Strategy aims to do this by ensuring delivery of cost effective services, collaborative partnerships, and accountable governance over the long term. The Strategy also fulfils MSC's statutory obligation to prepare a Waste Reduction and Recycling Plan under the *Waste Reduction and Recycling Act 2011*.

The delivery of a sustainable waste management service is complex. There are several factors that must be considered when forward planning, including, but not limited to the changing waste policy setting, cost of providing services, increasing waste volumes and changing composition, ever changing government regulation, and initiatives and opportunities in regional partnerships. With this complexity in mind, the Strategy is designed to offer flexibility and resilience whilst outlining actions to achieve key corporate performance indicators and responsible waste management objectives.

It does this through giving consideration to the current and projected regulatory, economic environmental and community contexts and the implications of these on MSC waste services. The Strategy was written at the time when the Queensland Waste Levy is coming into effect, the Queensland Container Refund Scheme has just commenced, and offshore recyclable commodity restrictions have been imposed. The Queensland Government is considering the introduction of landfill bans on waste streams including clean construction and demolition waste (C&D), and domestic green waste. These changing regulatory settings highlights the dynamic nature of the waste industry, and the way Waste Strategies need to be flexible enough to account for pending future changes, at the same time as focusing on the provision of a fundamentally sound waste management system which maintains basic public environmental health outcomes.

The analysis of these waste management drivers along with MSC's waste profile has resulted in the identification of key strategic focus areas for MSC. These strategic focus areas reflect the need for waste reduction, advocating for economic opportunities in the circular economy, and the requirement for investment in waste infrastructure and services for the future whilst fostering community and regional partnerships. MSC is also recognised as a key focus as having a lead role in the community in respect to managing its own waste.

From these key strategic focus areas, actions have been derived for implementation over the long term to achieve the objectives of this Strategy. Whilst comprehensive, it is recognised that the flexibility to make reactive decisions is best provided for through a set of guiding principles. This will ensure that the sum of decisions made over the lifespan of this Strategy are not ad-hoc, but contribute to our corporate vision of a growing, confident and sustainable shire. Decisions made in consideration of financial sustainability, service to the community, sound asset management principles, environmentally sustainable development and transparent governance including the waste hierarchy will ensure a sound and resilient waste management service.

Over the course of this Strategy's 10 year term, MSC will navigate key waste management contracts which have significant influence over the waste management services provided to the community. This will be done whilst constantly exploring opportunities to recycle waste streams through alternative models. MSC will evaluate investments in infrastructure and devise the most economically prudent waste services for the benefit of the community and the environment.



Figure 2 Kerbside collection waste being unloaded at Mareeba Waste Transfer Station.

1. Background

Mareeba Shire Council (MSC) is located in Far North Queensland, west of Cairns.

MSC provides local governance for a geographically dispersed population of **21,557** persons across an administrative area of 53,457 square metres, (ABS.gov.au, 2018).

The main commercial and administrative centre of the shire is Mareeba, which is located 64 km west of Cairns, and has a population of **8,271** (ABS.gov.au, 2018). Most of the shire's remaining population reside in and around smaller towns and districts of Kuranda, Dimbulah, Koah, Speewah, Biboohra, Mt Molloy, Julatten, Mt Carbine, Mutchilba, Irvinebank, Watsonville, Almaden and Chillagoe.

MSC seeks to implement enabling infrastructure to develop Mareeba as an industrial and service hub whilst promoting the Shire as a desirable lifestyle destination. To support these objectives, MSC is looking to ensure a sustainable waste service into the future.

In recent decades, the service delivery model for MSC's waste services has significantly grown in complexity from traditional local government waste collection and disposal services to providing a major waste disposal facility accepting domestic and commercial waste from the Cairns region.

This complexity led MSC to undertake a Waste Service Situation Analysis and Risk Identification Review in 2015 to identify and prioritise management issues affecting the provision of waste services. The resultant report (the Pacifica Report) provided a number of findings, including a key priority to develop a Waste Management Services Strategy that will ensure a sustainable waste service delivery over the long term.

The *Waste Reduction and Recycling Act 2011* also requires local government to prepare and implement a Waste Reduction and Recycling Plan. MSC embraced the business need to prepare a Waste Management Strategy that would also fulfil this statutory obligation.

Aurecon were engaged to undertake fundamental waste strategy planning work whereby a workshop was undertaken with key Council officers, followed by analysis of Mareeba Shire's waste collection and treatment data.

Concurrently, Far North Queensland Regional Organisation of Councils (FNQROC) engaged Arcadis to develop a Regional Waste Management Prioritisation and Resource Recovery Options Report (Arcadis Report). The Arcadis Report will assist FNQROC member councils to make informed decisions regarding the future development and improvement of the region's waste and resource recovery sector, based on evidence of need and prioritisation of options according to the greatest benefits.

1.1. What is the Waste Management Services Strategy and How Will It Be Used?

This Waste Management Strategy firstly describes the legislative, economic and community context in which MSC operates its current waste management services. These are considered to be the waste management drivers relevant to Mareeba Shire. A baseline description of the shire's waste profile is then given providing some quantification of waste generation trends and finances. Combined, the waste industry drivers and the shire's waste profile are shaped into key strategic focus areas and broad strategic objectives. These are then considered against a set of waste management guiding principles that align to our corporate performance indicators, Figure 3.

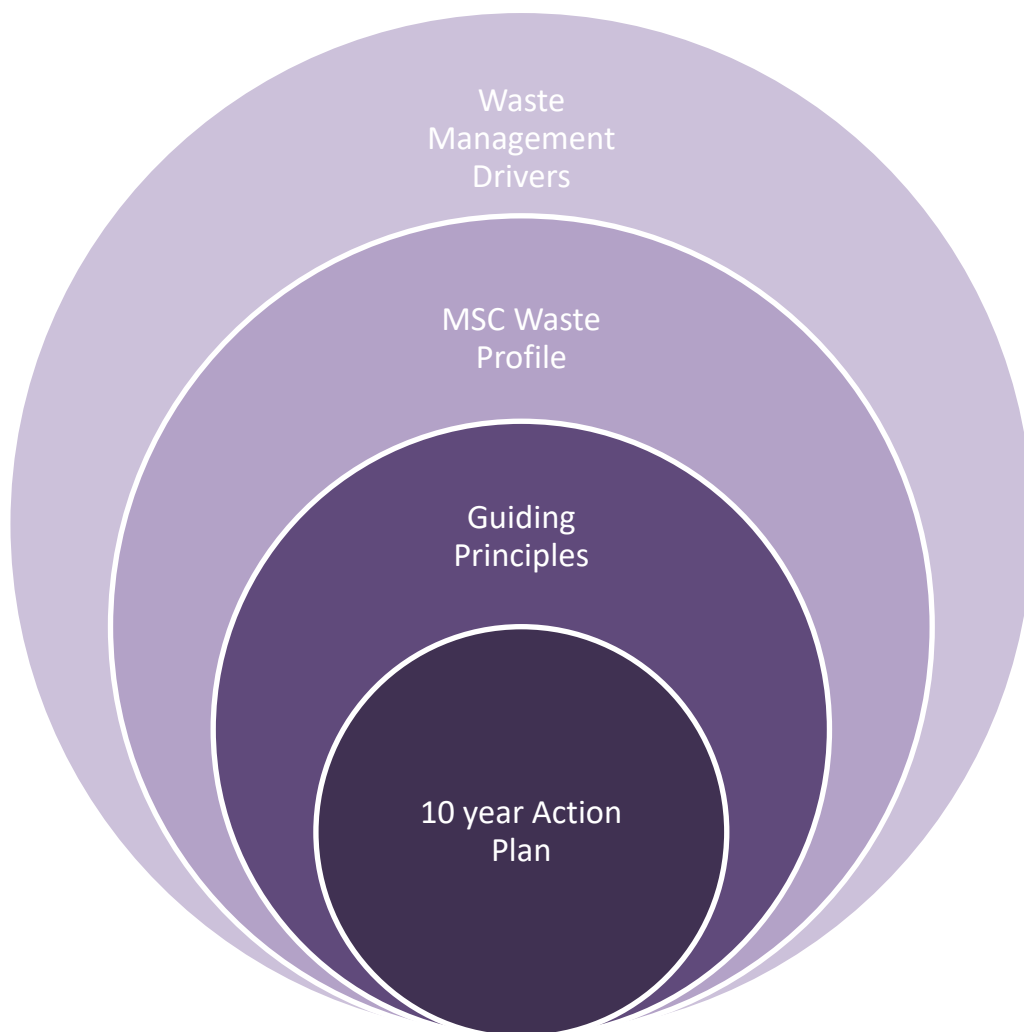


Figure 3 MSC Waste Strategy Methodology

Out of these strategic focus areas, a set of key actions, contained in Table 7, to be planned for and implemented over the next ten (10) years emerged that will:

- Outline the waste management service for a ten (10) year period and forecast the service beyond the Waste Management Contract 1396 with SUEZ;
- Identify appropriate waste management infrastructure required to accommodate future population growth and to provide a foundation for future waste management planning decisions;
- Develop plans to deal with any residual risk identified in the Pacifica Report;
- Integrate customer service, asset management, safety and environmental responsibilities;
- Build on the opportunities and constraints identified in state and regional waste investigations;
- Meet regulatory requirements under the *Waste Reduction and Recycling Act 2011* about waste planning;
- Develop contingency, flexibility and capacity to respond to change in Queensland and Australian Government Waste Policy; and
- Integrate community aspirations about waste services and provide meaningful information and education.

Thereupon, this Strategy will be used to inform a number of corporate management plans and tools as summarised in Figure 4:



Figure 4 Waste Strategy Relationship

The Waste Strategy key strategic focus areas and action plan will link with and inform the Asset Management Plan to strengthen Council's long term financial sustainability for waste services. Under the direction of the Waste Strategy, the Asset Management Plan will boost Council's ability to:

- Implement an integrated risk-based asset management strategy to deliver an optimal balance between affordability and levels of service for waste services,
- Develop and implement waste asset management planning documents that consider the services and the associated service levels, costs and risks,
- Set waste fees at a level that ensures waste assets can be maintained at their agreed service level in accordance with the Waste Strategy, the Asset Management Plan, and Long Term Financial Plan,
- Systematically review, update and report on the performance of the waste asset management plans and long term financial plan including the underlying assumptions, discount rates and growth rates, and
- Communicate progress towards achieving best practice waste asset management to internal and external stakeholders.



Figure 5 Mareeba Landfill

2. Waste Management Service Drivers

Service drivers such as environmental and economic regulation, external policy setting, and the desire to implement a best practice system combine with community expectations to provide the context of the waste management service as it is today, and shape how it will be delivered in the future, Figure 6. This section discusses these drivers and their implication(s) to Mareeba Shire Council.

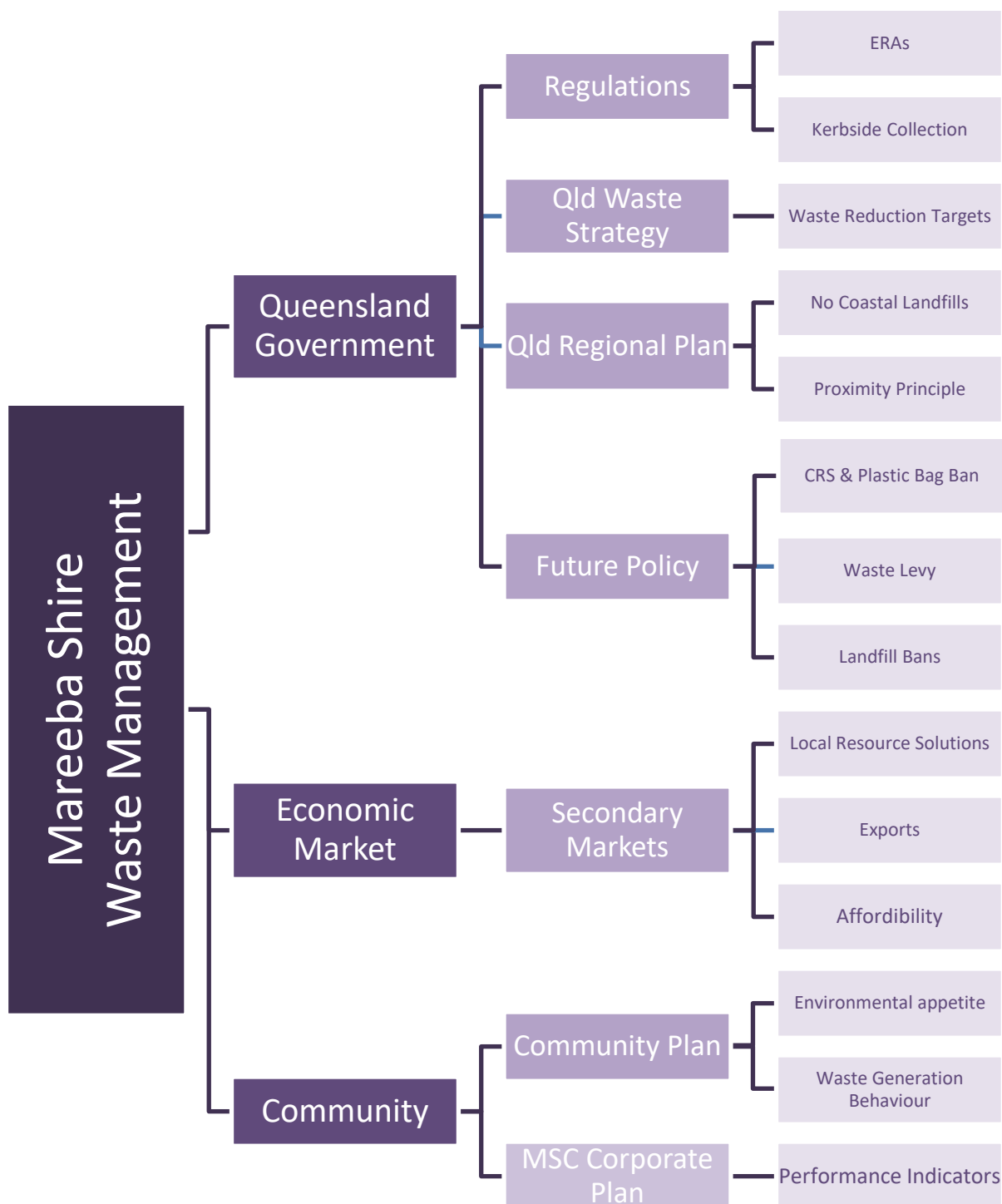


Figure 6 Waste Management Service Drivers

2.1. Queensland Waste Strategy

The Queensland Waste Avoidance and Resource Productivity Strategy (2014–2024) (Queensland Strategy) commits Queensland to becoming a national leader in avoiding unnecessary consumption and waste generation, adopting innovative resource recovery approaches, and managing all products and materials as valuable and finite resources.

The Queensland Strategy sets overall objectives to reduce waste generation per capita by 5% and waste to landfill by 15%. It also recognises the state’s size and decentralised population requires flexible solutions, including local materials reuse and, in some cases, different regional recycling targets, Table 1 .

Waste Stream	Generation 2014-15 (tonnes)*	Recycling rate 2014-15	Recycling target (2024)
Municipal Solid Waste (MSW)	2,551,321	31.2%	50% state-wide > metro – 55% > regional – 45% > remote – improve practice
Commercial and Industrial Waste (C&I)	2,587,756	41.3%	55%
Construction and Demolition Waste (C&D)	3,299,966	54.7%	80%

Table 1 Queensland's baseline waste numbers and 2024 targets

** Based on facilities reporting to the State of the Waste Report 2015, which does not provide complete coverage of the industry*

It is possible that these targets may be reviewed by the current and future State governments over the term of this Strategy especially with the introduction of any Queensland waste levy (see section 2.2.4). It is MSC's intention that this Strategy is flexible and robust to adapt to external drivers whilst balancing the fundamental provision of a public health service to the community.

MSC Implication:

It is in Mareeba's best economic interests to encourage waste reduction and diversion in line with the current policy, to encourage partnerships and development that stimulates the processing of recovered resources within the regional economy.

2.2. Future Queensland Government Policies

The State Government is currently considering a number of waste policy options which could have an impact on the way waste is managed in the region in the future, and the recovery of resources from waste. A brief discussion of the key policies being considered is provided below.

2.2.1. Landfill Disposal Bans

The *Waste Reduction and Recycling Act 2011* makes provision for the introduction of landfill disposal bans in Queensland and recently undertook stakeholder consultation and a preliminary cost benefit analysis that indicates that banning the following materials would be viable from a financial perspective:

- Sorted concrete,
- Tyres,
- Municipal green waste.

These materials were deemed feasible to ban from landfills given the access to secondary markets and/or the small quantities that are currently being disposed of to landfill.

MSC implications:

- MSC already provides for separation and recovery of green waste at transfer stations, so the volume being landfilled is minimal. Source separation of green waste is incentivised by providing this disposal option at no charge to the customer.

Any green waste in the general kerbside bin is recovered through the Advanced Resource Recovery Facility (ARRF) under the current waste management arrangements with SUEZ, Cairns Regional and Douglas Shire Councils. No further green waste material is accepted by the ARRF.

While mulch from green waste has potential beneficial uses, there are limited markets for the product and creates operational issues with stockpiled materials. A business analysis and evaluation is required, either separately or part of an organics plan, to assess the product and any further market potential e.g. any perceived quality issues, value adding opportunities (such as addition of blood and bone) to increase value and demand.

- MSC is currently separating clean concrete and using it on site at Mareeba Landfill. At Chillagoe Landfill, concrete waste is being stockpiled. The external market outlets for recovered concrete are very limited and would require significant development. Furthermore, the relatively small quantities received mean that processing costs are high.
- Minimal impact is expected for tyres as they are already source separated and recycled albeit at a cost to Council. Tyre reprocessing into crumb for inclusion in asphalt and playground products etc is an established technology and may be a secondary market area to be encouraged to establish in the Shire.

2.2.2. Container Refund Scheme

The Queensland Government has recently established a state-based container refund scheme (CRS) intended to reduce littering and to improve source separation of recyclable materials. The management and financial impacts on councils are not yet clear. The CRS could potentially divert valuable materials away from existing recycling systems, reducing overall MRF volumes which may potential drive MRF gate fees up. Three Container Refund Points (CRPs) will operate across the Mareeba local government areas, being Mareeba and Kuranda.

MSC implications:

- MSC currently offers container recycling at its WTSs but does not have a Material Recovery Facility. Whilst some of the recyclables are anticipated to be diverted from this Council service, there is little immediate impact anticipated except for potential nuisance issues at Container Refund Point (CRP) sites. The CRS may result in a lower viability in offering standalone alternative recycling collection methods such as the Kuranda recycling hub. Conversely, the CRS may offer opportunity for Council to require Container Refund Operators to provide recycling bins for containers that are not accepted through the scheme. Alternatively, MSC may consider providing a recycling hub service adjacent to a container refund point.

2.2.3. Lightweight plastic shopping bag ban

In conjunction with the CRS, the Queensland Government has introduced a plastic bag ban. Like the CRS, it is intended to reduce littering and the harmful impacts of plastic bags on wildlife. Plastic bags less than 35 micron in thickness are being targeted due to their lightweight and includes compostable or biodegradable bags.

Whilst the immediate management and financial impact will be upon retailers, experience from other states has shown a risk of retailers opting to provide a thicker micron thickness plastic bag instead.

MSC implications:

Overall the number of plastic bags should decline, resulting in less process waste being produced in the ARRF and subsequently being landfilled in Mareeba Landfill. However, some residents may use the thicker reusable bags offered by the major retailers as bin liners resulting in more plastic waste. Education around waste reduction should include handy tips about what residents can use for bin liners instead of reusable bags.

2.2.4. Waste Levy

It is likely that a waste levy may be reintroduced during this term of Queensland Labor Government (2017 - 2020). The establishment of a waste levy estimated at \$70/ MSW tonne was tabled in Parliament March 2018 and is set to pass parliament late 2018. The levy is in response to the public exposure of the movement of NSW waste cross borders to Queensland in 2017 to avoid paying NSW landfill levies. For the Queensland Labor Party, it will deliver on their commitment to introduce a market-based mechanisms to reduce waste to landfill, and to make recycling more cost effective (State Policy Platform, 2017).

While any levy in the future will increase the cost of sending waste to landfill, it may also promote the growth and development of secondary markets, improve the feasibility of resource recovery options and potentially provide funding for improved waste infrastructure.

MSC implications:

- The implication for MSC is for the Mareeba Landfill gate fee to increase by the waste levy amount.
- The cost of disposal of dry bulky MSW at Springmount post Mareeba Landfill closure will increase.
- The State Waste Levy will be charged in addition to the current price structure of the Waste Disposal Agreement with SUEZ.
- There may also be costs associated with administering the waste levy. Dependent upon the legislative requirements, MSC may need to establish a weighbridge at Kuranda, a Resource Recovery Area at Mareeba, CCTV, survey stockpiles and establish and maintain data reporting systems.
- Council will need to be ready to submit applications to the State for Levy Ready funding.
- A review of the current fees and charges should be undertaken to ensure the true cost of the waste levy to Council is managed.
- Transport to the Cairns MRF or other diversion activities may also become more viable, increasing the economic incentive to divert recyclable commodities.
- Department of Environment and Science (DES) may introduce an updated Queensland Waste Strategy which may contain revised waste reduction targets. This Strategy, in later sections, aligns MSC targets with the current Queensland waste reduction targets. MSC targets may need to be revised and action measures assessed for their adequacy in reaching those revised targets.

2.3. Regulatory Context

2.3.1. Environmental Protection Act 1994

The *Environmental Protection Act 1994* (EP Act) is the overarching legislation in Queensland that sets the framework for achieving ecologically sustainable development and managing the impacts of various activities, including disposal and management of waste. The EP Act also establishes a system of licences, referred to as 'environmental authorities' (EAs), for conducting particular activities including various waste management activities.

MSC implications:

- MSC holds an Environmental Authority to undertake waste disposal activities at numerous sites although the majority have now been converted into transfer stations. At these sites, MSC is liable for rehabilitation and aftercare for up to 30 years. The Mareeba Landfill is authorised to accept up to 100,000 tonnes per year whilst the small rural sites are authorised to receive no more than 5,000 tonnes per year. The licence also authorises MSC to undertake composting and soil conditioner manufacturing at its Mareeba Landfill site.

2.3.2. Waste Reduction and Recycling Act 2011 and Regulation 2011

The *Waste Reduction and Recycling Act 2011* is the principal legislation to promote waste reduction and resource recovery as a shared responsibility in order to minimise the impact of waste generation and disposal.

The Waste Reduction and Recycling Regulation 2011 outlines the management requirements for certain waste types, the obligations for operators of waste sites and requirements for waste data reporting. In accordance with the regulation, Council has designated waste benefitted areas for waste collection services.

2.3.3. Planning Act 2009

The *Planning Act 2009* (SPA) is the key legislation that coordinates planning and development approvals within Queensland. It establishes State Planning Regulatory Provisions (SPRPs), to support the implementation of regional plans, and State Planning Policies (SPP), which express the policies on specific matters of State interest. The Planning Act also allows for the designation of land for future community infrastructure to fast track the development approval process.

MSC implications:

- There is no Council managed land designated for future waste management activities however it is not anticipated that MSC would require another landfill site within the next 10 years

2.4. Regional Planning Context

While land use planning is primarily the responsibility of local government, the state has an interest in ensuring that broader regional outcomes are achieved through the application of state policy in local planning.

The purpose of regional plans is to identify regional outcomes to help achieve state interests. Regional policies are used to facilitate these outcomes by addressing existing or emerging regional issues, such as competition between land uses. Regional plans are developed through collaboration with local governments, key industry groups and the wider community to ensure the aspirations of all regional stakeholders are considered.

The *Far North Queensland Regional Plan 2009* covers Cairns, Mareeba, Yarrabah, Wujal Wujal, Douglas, Tablelands and Cassowary Coast. On waste management infrastructure, the plan states its support for the proximity principle:

The proximity principle—fostering and encouraging local solutions for waste management and resource recovery—will be encouraged where feasible. The focus will be more on providing local facilities rather than regional, such as transfer stations. Recycling and other waste recovery facilities may need to be regional to achieve economies of scale and for proximity to transport infrastructure. Landfill facilities should also be regional, but these are the least preferred method on the waste hierarchy. (Dilgp.qld.gov.au, 2018, p110)

The plan also comments on the siting of landfills in the region, noting:

The preferred location for any future landfill facilities is the western side of the Great Dividing Range, removed from the wet tropics, the coastline and Great Barrier Reef. Any future landfills should be located in geologically stable areas that are not flood prone or adjacent to areas of high ecological significance.

An integrated and coordinated network for sustainable waste management and resource recovery is adopted across the region to achieve greater resource use efficiencies and effectiveness, and better environmental, social and economic outcomes. (Dilgp.qld.gov.au, 2018, p110)

MSC implications:

- The Regional Plan assures a continued need into the future for any landfill infrastructure to be located within the Mareeba Shire. Currently there are the two landfills - Springmount Waste Facility and Mareeba Landfill. With the contractual arrangement for Mareeba Landfill set to end in 2020, Springmount Landfill would be the only landfill servicing FNQ regional Councils. It has at least 60 years capacity setting it up to be the major regional landfill. There is a risk, however that it may create an overreliance on an external, privately run landfill.

2.5. Economic Market Context

In conjunction with legislative incentives, the recycling and end-of-waste market is driven by the demand for the resources. Arcadis (2016) found that generally the local secondary market is limited

and under developed in Far North Queensland (FNQ) which presents a significant constraint on resource recovery. Additionally, MSC identified through a community survey in 2015 that ratepayers have a very limited desire to pay for recycling services in Mareeba Shire which also presents little economic incentive to collect and process recyclables.

Existing local secondary markets consist of local mulch production from green waste, compost production through the Cairns Advanced Resource Recovery Facility (ARRF), glass recycling at the Cairns Material Recovery Facility (MRF), scrap steel and biosolids beneficial reuse. Significant constraints exist for the development of local reprocessing solutions, including the low tonnage of feedstock material meaning MSC cannot achieve economies of scale, a lack of demand for the end product, limited ability to produce diverted product to required specifications, and the cost incurred by Council, rather than revenue, to transport the materials.

The bulk of Mareeba Shire's domestic recyclables are transported to the Cairns Materials Recovery Facility where materials are sorted and rail freighted to re-processors in southern markets.

China, as a developing nation, has long been the recipient of recyclables due to its demand for resources and low cost of import and processing. In recent years, the environmental and human health impact of processing recyclables in China has become apparent and from early 2018, China ceased accepting post-consumer plastics.

Joint local government initiatives or partnerships through FNQROC provide a viable economic outcome for Council to achieve economies of scale regionally with subsequently lower costs, as presently the case for biosolids management, organics resource recovery and kerbside collection. Ferrous and non-ferrous metals, on the contrary, generates revenue for Council and likewise, partnerships through FNQROC produce a more profitable outcome.

MSC implications:

- MSC should continue to work with FNQROC to develop the feasibility of secondary markets in the region and encourage industry to establish within Mareeba Shire.

2.6. Community Drivers

2.6.1. Mareeba Shire Corporate Plan (2018 - 2022)

Through adoption of this Strategy, Mareeba Shire Council will deliver waste services consistent with the Mareeba Shire Council Corporate Plan 2018- 2022 and this document in turn will inform future Corporate Plans. The key strategic areas of the Corporate Plan are integrated into the guiding principles of the Waste Strategy to inform future waste management decisions and to align performance outcomes with the Corporate Plan.

The Corporate Plan 2018 - 2022 specifically sets the following key performance indicator for waste:

EAE1 Environmentally responsible and efficient waste and wastewater management

- | |
|--|
| <ul style="list-style-type: none">• Promote the minimisation of waste the community creates. |
|--|

MSC Implication:

- MSC has commenced community engagement themes around "Rethink your waste, Reduce it" and "Your Waste Our Environment". These are displayed on the JJ Richards rubbish trucks. MSC can build upon this message through community engagement to promote waste minimisation.
- Effective promotion of waste minimisation should entail analysis of waste generation data and monitoring of waste volumes processed at WTSs, consideration of population growth, infrastructure and service requirements to divert waste resources from landfilling.

2.6.2. Tablelands Community Plan 2021

As part of the review of the Community Plan in 2016, specific feedback was sought from community regarding the most important waste issues for MSC in the long term. A range of issues were identified by the community representatives but by far the most popular feedback item from those who attended was for improved recycling services followed by ensuring good accessibility (opening hours) to a waste disposal facility.

The recommendation for improved recycling services was consistent across all localities and included recommendations for kerbside recycling, recycling hubs and being able to recycle more goods, Figure

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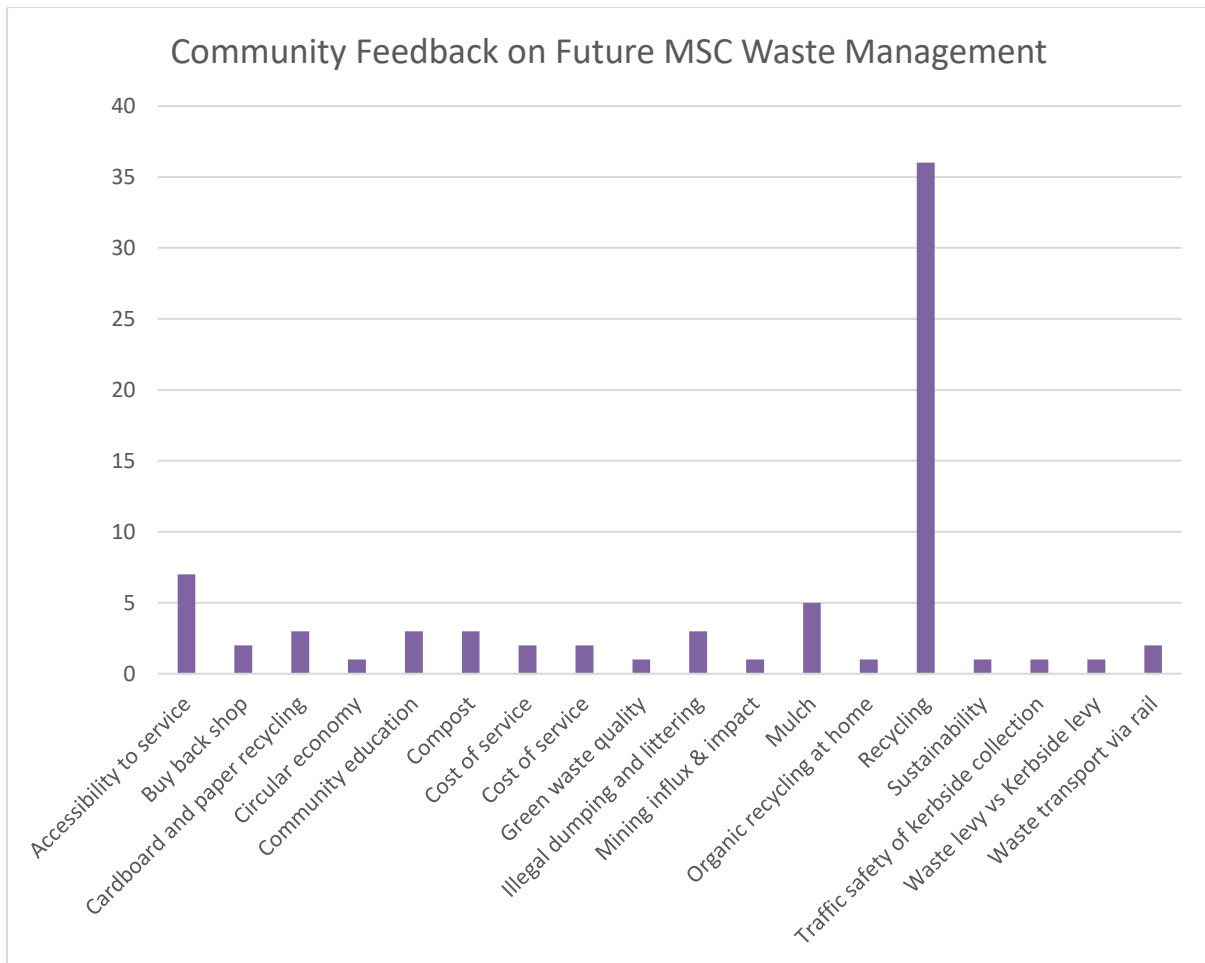


Figure 7 Community recommended most important waste issues for MSC

The positive recommendation for recycling during the Community Plan feedback process was generally consistent with a survey that MSC undertook in 2015 to understand the desire for a kerbside recycling service. This survey was an "opt in" style survey that explored whether ratepayers that received a kerbside waste collection service were willing to pay for an additional recycling service. Ratepayers were given a choice of fee levels that they would consider acceptable for the service. These fee levels were based on an assessment where the service would be considered feasible if a certain number of positive responses were received for a corresponding fee level. Of 6,393 invited to survey, only 323 positive responses were received, with overall feedback indicating there was a limited desire by respondents to pay for an additional service. As a result, the recycling service was deemed economically unviable and was not further progressed.

The survey was limited however in that it did not gauge support for recycling initiatives in general and did not survey those in rental accommodation which accounts for about a third of residential tenure in Mareeba Shire (ABS.gov.au,2018).

The survey did highlight anecdotal evidence that some ratepayers were satisfied using the recycling services offered at WTSs. However, feedback from the Kuranda district identified access to this service was difficult due to its location in Koah and subsequently MSC moved to implement a

Recycling Hub at the Community Precinct in Kuranda, Arara St. The recycling hub has been very successful with service levels increasing.

3. Mareeba Shire Waste Profile

This section of the Strategy outlines the existing waste infrastructure, services, contracts, waste generation trends and waste finances.

3.1. Current Waste Infrastructure

MSC manages the following waste infrastructure assets using a combination of internal staff and external contractors:

Table 2 MSC Waste Infrastructure

Asset	Management
Almaden Transfer Station	External Contract
Dimbulah Transfer Station	External Contract
Mutchilba Transfer Station	External Contract
Irvinebank Transfer Station	External Contract
Julatten Transfer Station	External Contract
Kuranda Transfer Station	External Contract
Mareeba Transfer Station	External Contract
Mt Carbine Transfer Station	External Contract
Mt Molloy Transfer Station	External Contract
Mareeba Landfill	Internally operated under SUEZ Waste Disposal Agreement.
Chillagoe Landfill and Transfer Station	External Contract
Old Mareeba Landfill	Internally managed

Waste infrastructure is primarily funded through the MSC Waste Management Levy charged each rateable period. Currently \$154 per year per rateable property provides funds to assist with the operation and management of the waste transfer stations and landfills.

In addition to the Waste Management Levy, revenue from external contracts such as scrap metal recycling and waste fees and charges also contribute to the Waste Fund.

The recent history of major infrastructure changes within Mareeba Shire are presented in Table 3.

Table 3 History of Major Waste Infrastructure Changes

Year	Site	Change	Reason	Investment \$M
2018	Chillagoe Landfill	Conversion to a manned secured facility	Capacity issues, unauthorised burning, no separation of wastes	0.02
2018	Leachate System Upgrade	Collection of leachate from OML and active landfill to sewage treatment plant.	Implementation of final cover system on OML and groundwater contamination preventative measure.	1.3
2018	Old Mareeba Landfill	Final Cover System and the subsequent creation of a large void available for landfilling activities.	Regulatory compliance, minimisation of groundwater contamination and other potential environmental harm.	6.0
2018	Mareeba Landfill	Construction of Surface Waters Treatment System.	Regulatory Compliance to minimise discharge of sediment laden waters off site.	0.5
2017	Almaden Landfill	Closure of small traditional trench landfill and implementation of transfer station in town.	Site was unmanned and easily accessible from the highway leading to improper use of the site, illegal burning and poor waste management behaviour.	0.1
2017	Kuranda WTS	Upgrade and reconfiguration	Upgrade capacity for waste receipt due to increase in services and the need to rectify functional issues.	0.2
2005	Irvinebank, Mt Molloy, Mt Carbine Landfill	Final cover systems and conversions to WTS.	To provide feedstock for new Waste Management Contract.	-

3.1.1. The Mareeba Landfill

The Mareeba Landfill site is comprised of:

- the active landfill (Cells, 2,3 and 5) which is fully lined, and includes systems for groundwater and leachate collection and pumping,
- the Old Mareeba Landfill, now rehabilitated and in its post closure care period, and
- the Waste Transfer Station.

The Mareeba Landfill primarily receives waste that is not able to be processed at the ARRF under the Waste Disposal Agreement (WDA) with SUEZ (*note - this contract is outlined in Waste Management Services*). It also receives dry bulky municipal solid waste (MSW) from MSC WTSs, and C&I waste.

This landfill unit is set to close in 2020 with the expiration of the WDA where SUEZ will fulfil their contractual obligation to design and construct the final cover system for the landfill.

In 2017 (calendar year), a total of 36,264.96 tonnes of waste was landfilled in Mareeba Landfill, whereby SUEZ contributed just over 32,000 tonnes. This has been a dramatic reduction from previous years where waste landfilled was approximately 75,000t per year. The reduction in landfilling was due to a change in the WDA made in 2017, Figure 8.

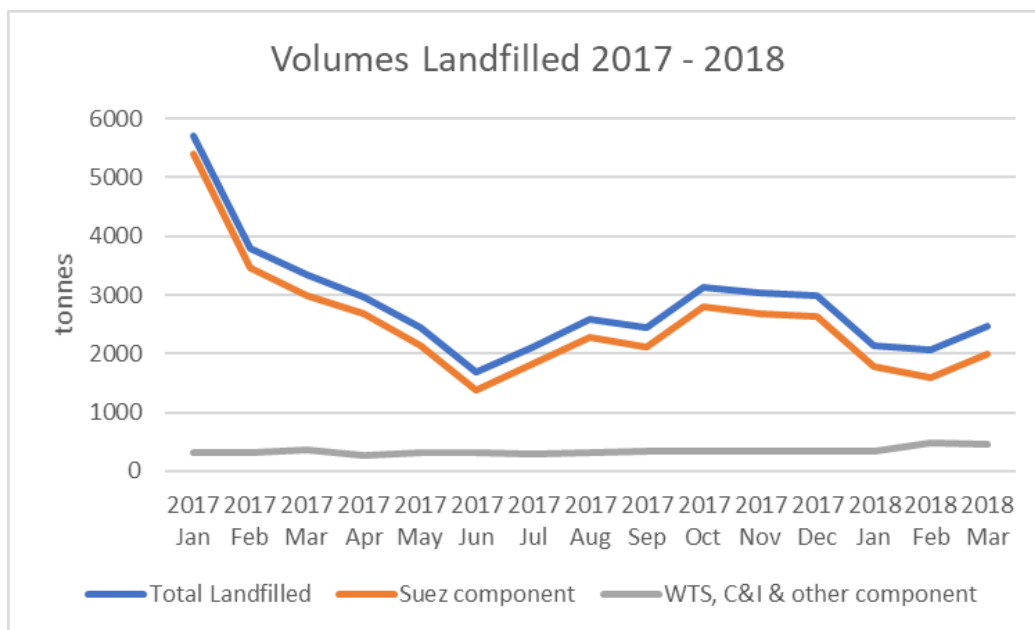


Figure 8 Landfilled volumes 2017 to date.

Prior to the change to the WDA, the Site Development Plan for the Mareeba Landfill showed a higher design height for the landfill and additional cells, 4 and 6, to the south of the site. These cells may only be developed if certain Environmental Authority conditions can be met that relate to odour management issues and more broadly environmental risk management.

In 2020, with the closure of the Mareeba Landfill under the WDA, approximately 4,000t of materials which are currently directed to landfill will require redirecting to either a new cell at the landfill, or to a third party.

In 2018, Council undertook an assessment of waste management options to identify the best value for money option over 20 - 30 years for that 4,000t of waste. Four options were assessed; upgrade the waste transfer station and direct the waste to a third party, commission a new landfill cell at the Old Mareeba Void (*note- this area is described below*), commission cells 4 and 6 for either putrescible or non-putrescible waste. That assessment identified that upgrading the waste transfer station is the best value for money option conditional upon Council maintaining the ability to recommence landfilling under the Environmental Authority if needed due to a third party gate fee

price hike.

3.1.2. The Old Mareeba Landfill (and Void)

The Old Mareeba Landfill (OML), located on the active Mareeba Landfill site, is comprised of a raised waste disposal mound overlaying traditional backfilled trench style gullies. It commenced receiving waste approximately in the mid 1980's and ceased waste receipt in the early 2000's. It is an unlined landform and received its final cover system in 2018. The OML is now in its post closure care period.

The consolidation of waste from the unlined informal Old Mareeba Landfill created a larger than expected void providing a discrete air space of 41,083m³ and opportunity for further landfilling. Operationally, the void is difficult to manage in the wet system and presents a structural risk to the infrastructure such as the leachate system and the northern bund wall. As such, the void requires filling. An assessment of landfill options at Mareeba Landfill identified that developing the void air space is more economically feasible than developing new cells associated with the current landfill unit as there is no financial cost to excavate and there are proximity constraints imposed by the environmental authority in relation to residential dwellings immediately to the south of the new landfill site (the potential for odour nuisance, groundwater and gas management risks issues).

The operational need to fill the void must be balanced by the whole of life cost for a landfill and the need for the upgrade to the existing transfer station. The upgrade to the waste transfer station will take priority with the use of the void as a landfill in the future if Council identifies financial incentive to do so. In the interim, Council will look to filling the hole operationally with clean earth or clean earthen materials such as bricks pavers, ceramics or concrete.

3.1.3. Chillagoe Landfill

MSC also operates a small traditional unlined trench landfill at Chillagoe which receives domestic and commercial waste. Concrete, tyres, batteries, ferrous and non-ferrous metals and green waste are separated, stockpiled or transported for recycling. Due to limited resources, this landfill was unmanned until 2018 and as result, illegal burning and unauthorised dumping of waste occurred at the site.

The current Chillagoe landfill trench is expected to reach capacity within the next year (by 2019), much sooner than expected due to the reestablishment of the Mungana mine site. The implications of developing new compliant landfill cells with leachate systems will be a significant cost to Council. Due to this reason, capacity issues and the waste management issues at the landfill, Council moved to secure and man the site and introduce fees and charges consistent with other MSC manned sites. There are now no unmanned waste disposal sites in Mareeba Shire.

Since the introduction of the supervision and fees and charges, Council has met opposition from the township and its commercial operators but it did provide economic incentive for the mining camp to minimise landfilling in the MSC Chillagoe landfill. The mining camp now manages the bulk of its waste through a third party.

A Site Development Plan for Chillagoe Landfill had been prepared and options for the development of further cells were included however Council financially modelled two different waste scenarios;

conversion to a waste transfer station or development of new fully engineered, compliant landfill cells with a Queensland Waste Levy ready weighbridge. The Waste Transfer Station model was identified as the best value for money option over the longer term again subject to Council maintaining the ability to recommence landfilling if needed due to a third-party gate fee price hike (Resource Innovations, 2018).

3.1.4. Waste Transfer Stations

MSC currently owns and operates, through external contracts, ten (10) Waste Transfer Stations: Kuranda, Mareeba, Irvinebank, Julatten, Mt Carbine, Mt Molloy, Dimbulah, Mutchilba, Almaden and Chillagoe (*note - Mareeba and Chillagoe operate as a Landfill and a waste transfer station*).

These waste transfer stations offer at least one bin for wet domestic waste disposal and one bin for dry bulky waste disposal. Transfer Stations also offer recycling collection points for a wide range of commodities but not all services are provided at all sites.

The Mareeba Waste Transfer Station is the primary waste transfer station for the Shire, processing Mareeba township waste, all waste from the other WTSs, all kerbside collection waste, and Mareeba Landfill waste. The Mareeba WTS is the only transfer station with a weighbridge. In the 2017 calendar year, the WTS processed:

- 56,269 tonnes total waste.
- 3900 tonnes dry bulky waste and 613 tonnes processable waste from all WTSs
- 5,117 tonnes kerbside waste
- 38 tonnes domestic recyclables
- 3,405 tonnes green waste
- 43 tonnes tyres
- 23 kL waste oil
- 25 tonnes used lead acid batteries
- 1200 tonnes ferrous scrap metal
- 32 tonnes agricultural plastic

The Mareeba WTS is currently at capacity with Roll On and Roll Off bins overflowing on the weekends and the site's layout is not conducive to effective supervision by waste transfer station staff. As result, waste is being deposited on the ground, in the wrong bins, and staff are inefficiently having to double handle the waste. The WTS will require a reconfiguration and upgrade in the near future to accommodate these issues and to accommodate increased transfer activities when the Mareeba Landfill closes, and to be able to divert more waste from landfill to be waste levy ready.

Kuranda WTS is the next largest WTS is Mareeba shire receiving domestic, commercial and recycling self-haul. The site receives substantial amounts of scrap metal, green waste and recyclables. It is also

nominated site under the *Queensland Biosecurity Act 2014* to receive green waste from invasive ant restricted areas. This site is at risk of waste being dropped off by Cairns residents, under charging, theft and nuisance break ins. Kuranda WTS may also require a weighbridge under the proposed waste levy to address the commercial and industrial component of waste received at this site.

3.1.5. Kuranda Recycling Hub, Arara Street.

In addition to the waste transfer station provided for Kuranda, a domestic recycling collection point is offered at the Kuranda Community Precinct. This was offered shortly after the outcome of the recycling survey in 2015 due to the pro-recycling stance from the community, the non-central location of the transfer station, and accessibility issues (Kuranda WTS is located in the locality of Koah). The site is well used and MSC has had to increase the service level at this Recycling Hub due to volumes received. The hub has very clear infographic signage there is minimal contamination with non-recyclables.

3.2. Waste Management Services

MSC delivers kerbside collection services, transfer station operation and landfilling waste services to the community. It is party to a number of waste management contracts most significantly, the Kerbside Collection Contract with JJ Richards, SUEZ 1396 Waste Management Contract and the SUEZ Waste Disposal Agreement.

Under these contracts, municipal solid waste streams sourced either through the kerbside bin collection in Designated Benefited Areas or at MSC waste transfer stations is transported to the ARRF in Cairns where putrescible waste (treatable waste) is processed to produce agricultural compost. SUEZ recovers a minimum of 50% of organics from this waste stream to produce saleable agricultural compost. Waste that enters this processing stream that cannot be composted e.g. plastic bags (process waste) and is then transported to Mareeba Landfill and Remondis' Springmount Waste Management Facility for landfilling, Figure 10.



Figure 9 Mayor Tom Gilmore welcoming the new kerbside collection trucks.

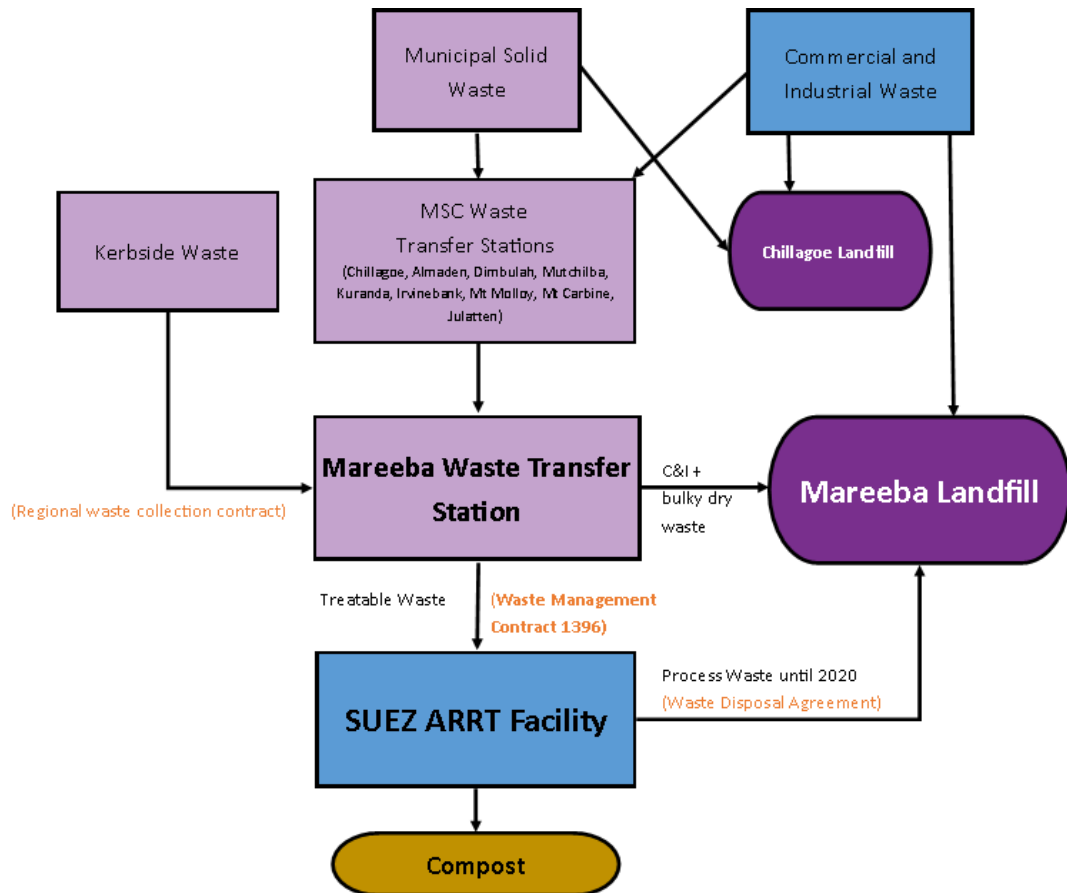


Figure 10 Mareeba Shire Waste Flows 2018 - 2026

A brief description of each of the services provided is outlined in Table 4 . These services must be delivered in compliance with relevant legislative requirements and contractual obligations.

Service provided as at 2018	Delivery model
Kerbside Collection Service	External Contract
Waste Transfer Stations (Chillagoe, Almaden, Irvinebank, Dimbulah, Mutchilba, Mareeba, Kuranda, Mt Molloy, Julatten, Mt Carbine)	External Contracts for transport of bins and day to day operation of the WTS
Mareeba Landfill Waste Disposal Facility 50,000 – 100,000 tonnes per year	Waste Disposal Agreement Contract with SUEZ.
Waste Disposal Facilities 2000 – 5000 tonnes per year (Chillagoe)	Internal
Ferrous metal	FNQROC contract
Non-ferrous metal	Opportunistic Secondary Market
Used Lead Acid Battery	FNQROC contract
Domestic Recyclables (eg Plastic, glass, aluminium)	CRC MRF
Hydrocarbon waste oil, oily waste	External Contract
Tyres	External Contract
E-waste	Opportunistic Secondary Market
Green waste	External Contract
Agricultural plastics	Opportunistic Secondary Market

Table 4 Mareeba Shire Council Waste and Resource Recovery Services as at 2018

3.2.1. Waste Disposal Agreement

In March 2006, MSC entered into a Waste Disposal Agreement (WDA) with CEC Resource Recovery Pty Ltd, now SUEZ. In 2017, the WDA was renegotiated after SUEZ terminated the contract and MSC conducted a Waste Service Situational Analysis and Risk Assessment. The contract is has an expected worth of \$1.1M in annual revenue for Council, depending on the quantity of waste disposed under the agreement.

Broadly, the WDA outlines the contractual requirements of SUEZ to design, construct and cap waste cells at the Mareeba Landfill and the requirements of MSC to operate the cells, manage the environmental impacts of the site and accept waste from SUEZ (with the exception of a 10,000 tonne per year allowance for Mareeba’s waste to be disposed of within the SUEZ constructed landfill cells).

The term of the WDA is until November 2020 whereby SUEZ will implement the final cover system and the landfill will enter into a Post Closure Care period.

3.2.2. Waste Management Contract No 1396

MSC is also a party to a separate contract, the Waste Management Contract, Contract No. 1396 (Contract No. 1396), between Cairns Regional Council, Douglas Shire Council, the Cairns Waste Management Group and CEC Resource Recovery (now SUEZ) where kerbside and self haul

putrescible waste is digested into compost of agricultural value. Contract No.1396 requires SUEZ to accept, transport, treat and dispose of this waste from the participating Councils.

Contract 1396 is scheduled to expire on 14 August 2026 unless there is a default by the contractor, Cairns Regional Council commits a substantial breach of the Contract, or SUEZ is unable or unwilling to perform the work required under the contract or remedy a default.

In the event that Contract 1396 terminates prior, MSC will assess the economic feasibility of disposal options during the WDA contract contingency period.

MSC is party to the Contract 1396 until 2026 with no option for termination or opting out for convenience. Despite the cost, the Contract provides a higher value outcome for the organic waste stream and with the previously outlined waste drivers is expected to continue the need for organics recovery into the future. Organics recycling requires significant capital investment, business modelling and contract development. Long term organics planning must commence now to ensure a smooth transition in 2026. Mareeba Shire offers suitable location for the solution due to the proximity to waste streams and proximity to the agricultural sector and there is less risk for associated environmental nuisance issues.

MSC should continue to work with other regional Councils to plan for the organics future and explore the Shire's capacity to site the facility and assess composters capability to tender in 2026. MSC should consider green waste as an additional feedstock to this organics solution also. A public - private partnership may also be considered to encourage the establishment of the organics recycling facility which will result in the development of additional jobs within the shire.

3.2.3. Kerbside Collection Contract

MSC provides kerbside collection services via an external contract to residences within Designated Benefitted Areas in the localities of Kuranda, Mareeba, Mutchilba, Dimbulah, Julatten and Mt Molloy. Currently, the service is for one 240L mobile garbage bin (MGB) per residence per week. The areas are designated under the *Waste Reduction and Recycling Act 2011* provisions through Council's budget process. The ability to designate areas under this legislation was set cease in July 2018 and as such Council, consistent with other Queensland local authorities, has transferred power to a local law.

In 2018, MSC entered into a nine (9) year kerbside collection contract with JJ Richards, with the opportunity to extend the contract for two additional years. This contract has a whole of life cost of approximately of \$8.8M. Further significant collection cost is incurred through the transport of this waste under Contract No.1396; the cost of participating in this contract is approximately \$750K per annum varying with waste volumes transported.

The collection contract is principally funded through the Waste Collection (kerbside) levy charged to each eligible property, every rateable period; \$278/year per service (one MGB lift per week).

Council will continue to monitor for uncharged services by conducting random audits. Council will also look at rationalising the benefitted areas and service modelling to improve service efficiencies whilst being mindful of contractual assumptions with JJ Richards i.e. the contract cost per service is

dependent upon a minimum number of pickups and variations to this can increase cost.

3.2.4. Other Contracts

MSC also currently manages its WTS through external contracts through to 2020 with the option to extend for a further two years. This coincides with the end term of the WDA contract with SUEZ in 2020. The aligning of termination dates reflects the need to review the impact on MSC's Waste Management Levy and the economic sustainability of managing the WTS externally.

Recyclables are managed through a number of external contracts and opportunistic partnerships with other Councils or external organisations.

Pacifica estimated the cost to Council of other various formal arrangements to be approximately \$360K pa.

3.2.5. Recycling

At the time of preparing this Strategy, MSC offer recycling services for:

- Domestic recyclables: plastic containers, glass, cans and tins,
- Green waste
- Electronic waste (computers, printers, televisions),
- Waste hydrocarbon oil,
- Tyres,
- Used Lead Acid Batteries
- Ferrous and non-ferrous scrap metal including degassed gas bottles, and
- Agricultural plastics including fluming, trickle tape, plastic insecticide drums.

These services are provided through WTSs and a recycling hub in Kuranda. Not all services are available at all sites. No domestic kerbside recycling is offered in Mareeba Shire and the Council does not offer a Commercial and Industrial recyclables collection service, Figure 11

In recent years, the number of commodities that can be recycled has increased and WTSs have had to accommodate additional resource recovery areas e.g. e-waste, agricultural plastics. It is likely, especially with the potential re-introduction of a waste levy, that the number of recyclable commodities will continue to grow. As such, WTSs will need flexibility to accommodate the segregated resources for transport e.g. extra bays, bins, sheds.

Currently all domestic recyclables are transported to Cairns MRF where goods are sorted and on-forwarded to secondary markets in southern centres. MSC recovered 92 tonnes of domestic recyclables in 2017, increasing from 70 T in 2014/2015. This represents a 32% increase in the recycling rate since 2014. Including organic waste recycling at the ARRF and mulching of green waste, MSC is only recycling about 23% of its total volume of waste, well below the State Waste Strategy's target of a 45% recycling rate by 2024.

Contamination rates of recyclables provided by MSC are low and are consistently below the Cairns Regional Council's acceptance criteria of 15%. This is primarily attributed to the fact that customers who participate in recycling at the WTS or Kuranda Recycle Hub do so voluntarily, and as such are generally more environmentally motivated to follow the correct practice.

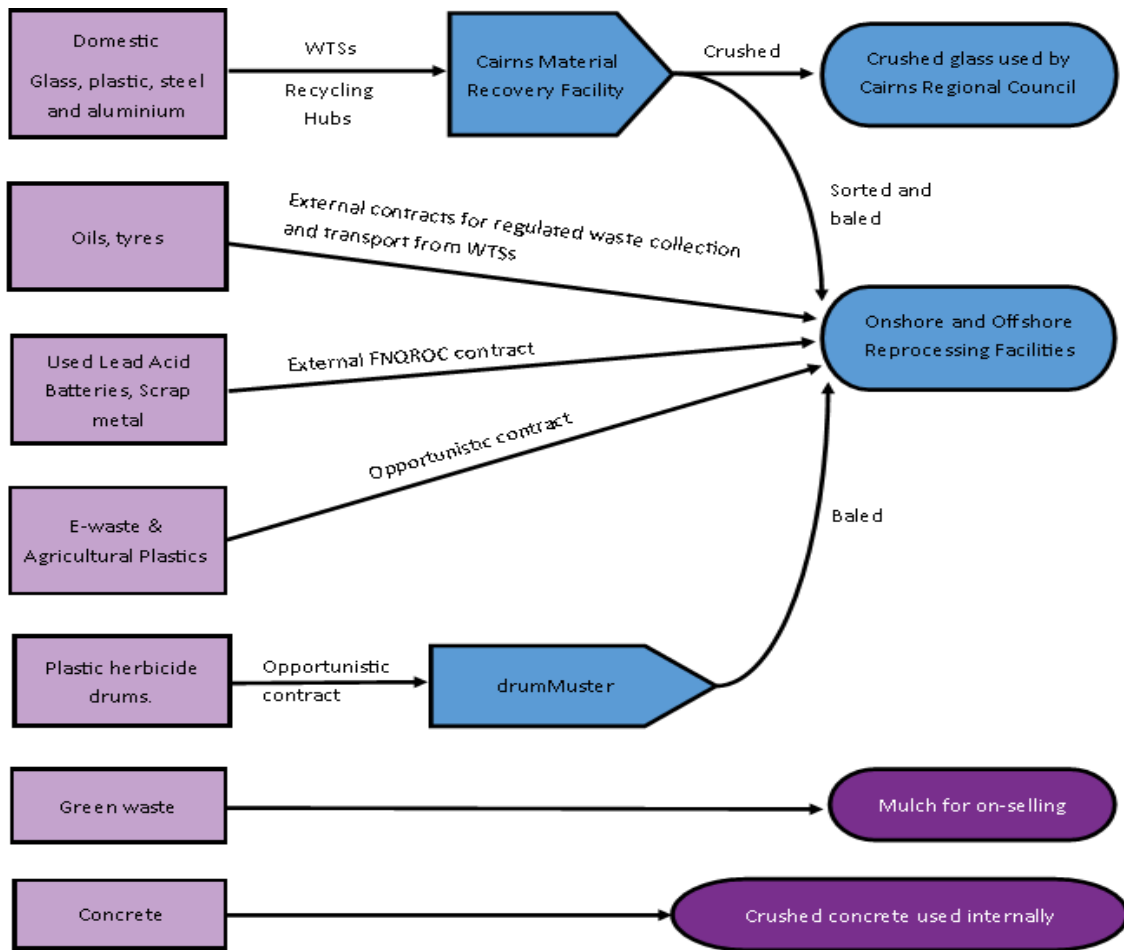


Figure 11 Recycling Waste Flows

3.2.6. Disaster Waste Management

MSC offers key waste management services in response to disasters to manage the public health risk associated with the large amounts of waste that is generated. Normal waste management facilities may be overwhelmed or may be cut off and alternative arrangements need to be made. In this situation, the Local Disaster Management Group will look to MSC Waste Services for alternatives.

Where the waste management hierarchy and public health issues conflict, measures to protect human health such as incineration and landfilling are the preferred methods of management as outlined in the Disaster Management Public Health Sub Plan. However, it would be prudent to have pre-planned scoped out alternative sites per locality or services for the management of waste and these be reviewed each year. It is also necessary to be prepared for the treatment of hazardous wastes such as asbestos.

3.3. MSC Waste Finances

To enable the provision of waste services to the community, MSC Waste raises revenue principally via Council imposed rates, the Waste Disposal Agreement (WDA) with SUEZ, interest in investments, and gate fees. This revenue stream offsets capital waste infrastructure upgrade, renewal, operation and maintenance expenses.

An internal analysis of the waste finances over the previous 3 year period has found that overall, the waste fund is downsizing yet remains sustainable. Key findings of that analysis were:

- Finances are being managed prudently in each respective waste management area.
- The kerbside collection waste financial trend is stable where revenue is sufficiently covering expenses.
- Landfill and transfer station revenue has recently decreased due to the decline in income under the WDA and the addition of the increased cost of environmental compliance to operate a landfill responsibly. However, it is important to note that it is predicted to stabilise over the term of the WDA.
- Despite market fluctuations, scrap metal continues to provide a revenue stream for MSC and this not expected to alter over the long term.

Going forward, it would be prudent to undertake a major review of fees and charges to ensure that the true cost of waste management has been updated and considered over the long term for financial sustainability. This will enable a good platform for decision making around market changes such as the introduction of a State imposed waste levy. Further, MSC must ensure that revenue is captured at each WTS in line with the current fees and charges and that recycling activities aim to be as cost effective or neutral as possible.

3.4. MSC Waste Production Trends

The Australian Bureau of Statistics (2018) identified that the total volume of waste generated in Australia each year has been growing faster than annual GDP growth and that of the total waste produced, less than a third (29%) originated from households and other municipal sources. Waste from the commercial and industrial sector accounted for 33%, whilst the construction and demolition sector accounted for 38%.

Waste data from Mareeba Shire Council's annual waste survey for the Queensland Government (2014 - 2017) suggests that municipal solid waste generated within the shire generally fits this profile whilst waste received for landfilling is heavily skewed towards commercial and industrial. This is predominantly due a number of factors including but not limited to:

- Mareeba Shire's contractual relationship under the WDA to receive commercial and industrial waste,

- There are two major landfills operating within the Shire (waste quantity and type received is split), and
- Mareeba Shire consists of remote rural and rural regional centres where a declining construction industry is greatly outweighed by the primary industry sector (.idcommunity, 2018).

Waste data collected via the Mareeba Landfill weighbridge shows that Mareeba Shire currently produces just under 35,000 tonnes annually including all MSW, C&I, C&D, green waste and recyclables. This figure does not include the tonnage received from the Cairns ARRF under the Waste Disposal Contract with SUEZ. Annually, each kerbside collection service contributes an average of 771kg, and at a 2.5 person per dwelling average for Mareeba (ABS,2018), each person throws out 310kg in the wheelie bin each year or 6kg each week.

Residents also dispose of waste at the WTSs and generate commercial and industrial waste e.g. when visiting cafes. When considering waste generation rates at WTSs and C&I rates, each person generates an average of 1458kg/year. This compares well to Queensland's baseline figure of 1900 kg/year. Despite this, there are economic incentives for MSC to continue to explore opportunities for further waste reduction. For instance, waste reduction measures will result in a lowering of transport costs to external processing / disposal facilities and will also help conserve remaining airspace MSC landfills.

The Australian National Waste Report 2016 identified that Queensland's waste generation is increasing at an average annual rate of 3.4%. Using this figure, Mareeba Shire is expected to produce just over 55,000t by 2026. Increasing waste generation is likely due to increasing consumerism and economic growth (ABS, 2018),Figure 122. 55,000T by 2026 also factors in Mareeba Shire's population annual growth rate of 1.2% (Queensland Government, 2018). Per person, waste generation will grow from 1458 kg/year in 2017 to 2260kg/year by 2026.

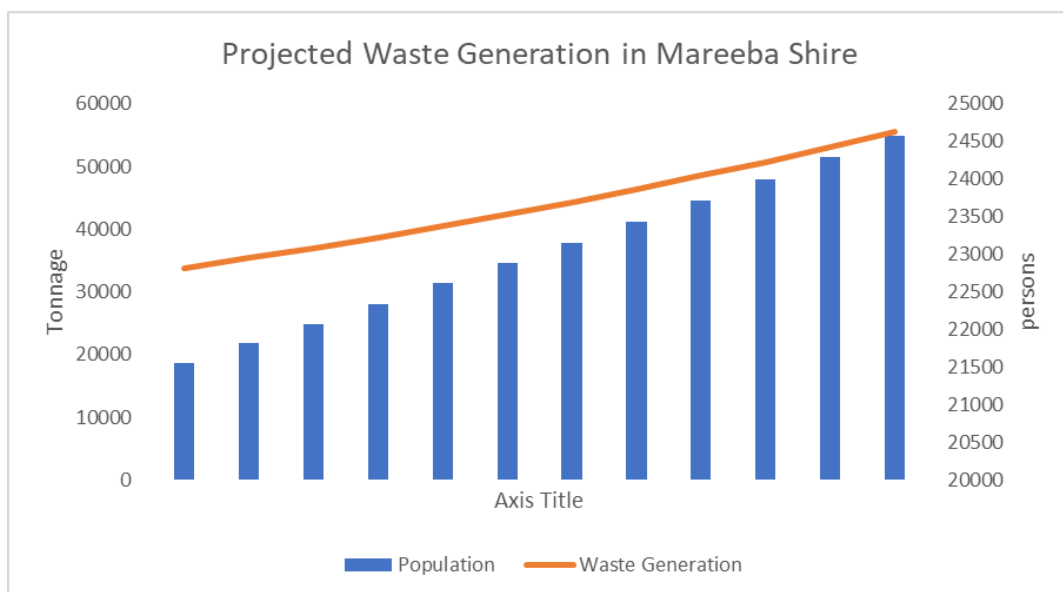


Figure 12 Projected Waste Production and Population Growth

3.5. Waste Data Gaps

3.5.1. Waste Composition

MSC currently does not have any data about the typical composition of kerbside waste. Cairns has undertaken wheelie bin composition audits and have discovered the compositions nominated in *Table 5*. Generally, we can use these proportions to infer a typical composition of kerbside waste in Mareeba Shire's kerbside collection.

Table 5 MGB composition data

Waste	CRC Red Lid	CRC Yellow Lid	Estimated MSC content
Landfill (non-recoverable)	24 %	9 %	25 %
Recyclables	17 %	91 %	50 %
Organic / kitchen	59 %	-	25 %*

* Cairns has a wetter climate and charges at its WTS for green waste receipt. 25% is more indicative of Mareeba's climate and no charge of green waste at WTSs.

At 50% recyclables composition, there is significant opportunity to reduce this waste going to landfill. There is incentive in diverting this waste to the Cairns MRF to minimise transport cost in the #1396 contract and the proposed waste levy. There is value in undertaking a kerbside waste composition audit to confirm this and identify opportunities for organics processing.

3.5.2. Waste Asset Register

The Pacifica Report identified that waste services did not have its waste asset register up to date and as a result, the depreciation component attributed to waste services is understated. The inability to fully recognise depreciation for assets in use understates operating costs and overstates the surplus arising from the waste services activities.

Council now has an updated list of assets for waste and register review has been prioritised in the upcoming internal revaluation process. New waste assets are also now capitalised and captured in the waste asset register.

3.5.3. Regional Waste Categorisation

The Arcadis report also identified that a regional approach to data management can provide significant benefits both directly and indirectly to FNQROC Council members. Good quality waste data is essential in planning waste services particularly at a regional collaborative level. It is understood that data inconsistencies may be occurring due to interpretation of waste categorisations. Council will continue to work with FNQROC Councils to build of waste data harmonisation.

4. Waste Management Services Guiding Principles

To deliver waste management services that are flexible and responsive to the dynamic waste environment and to be consistent with the MSC corporate strategies, a set of guiding principles are necessary to define waste management operations and to inform decisions.

It is envisioned that MSC officers will use these principles in making day to day decisions and in recommending items for Council adoption. Likewise, this strategy and its vision and guiding principles, once adopted, will inform Councillors in making decisions about waste management services.

4.1. Guiding Principle One: Financial Sustainability

The environmental impacts of waste generation are many and complex to solve, ranging from littering, consumption of resources and pollution. These impacts have consequential financial implications for Council responding to these issues. Council will aim to strike an optimal balance between affordability, levels of service and risk management to provide a waste management service that meets the community's environmental health needs.

4.2. Guiding Principle Two: Community Service

Waste Services will promote responsible waste management throughout the shire whilst retaining flexibility in how services and facilities are delivered to reflect community's diversity, to ensure equitable access and to allow beneficial partnerships.

MSC will promote responsible waste management consistent with the themes of "Your Waste, Our Environment" and "Rethink Your Waste, Reduce It". The aim of these programs is for community to better understand their waste generation behaviour and adopt ways to reduce the volume of waste produced.

Waste Services will also be responsive to the community's waste during natural and manmade disasters through the implementation of a Disaster Management sub-plan for Waste Management.

4.3. Guiding Principle Three: Beneficial Infrastructure

To deliver responsible waste management services that are responsive to the community's needs over the long term, Council will manage and plan for appropriate and regulatory compliant infrastructure in accordance with sound asset management principles.

4.4. Guiding Principle Four: Environmentally Sustainable Development

To support the growing population and local economy, Council's Waste Services must anticipate and respond to that growth in its waste services whilst acknowledging the negative impact that inappropriate waste management can have on the economy.

Waste presents opportunities in "closing the loop" where all waste is considered valuable as a resource or for its inherent energy and is kept in the economy for as long as possible and out of

landfills i.e. the circular economy. New waste and resource management initiatives present the opportunity for Council to promote economic growth within the Shire.

4.5. Guiding Principle Four: Reduce, Reuse, Recycle

Council will make sound decisions based on this Strategy to achieve regulatory compliance and improved waste reduction aligned with the industry waste hierarchy principles, Figure 133, balanced against community aspiration, long-term financial and asset sustainability, and the provision of affordable levels of service.

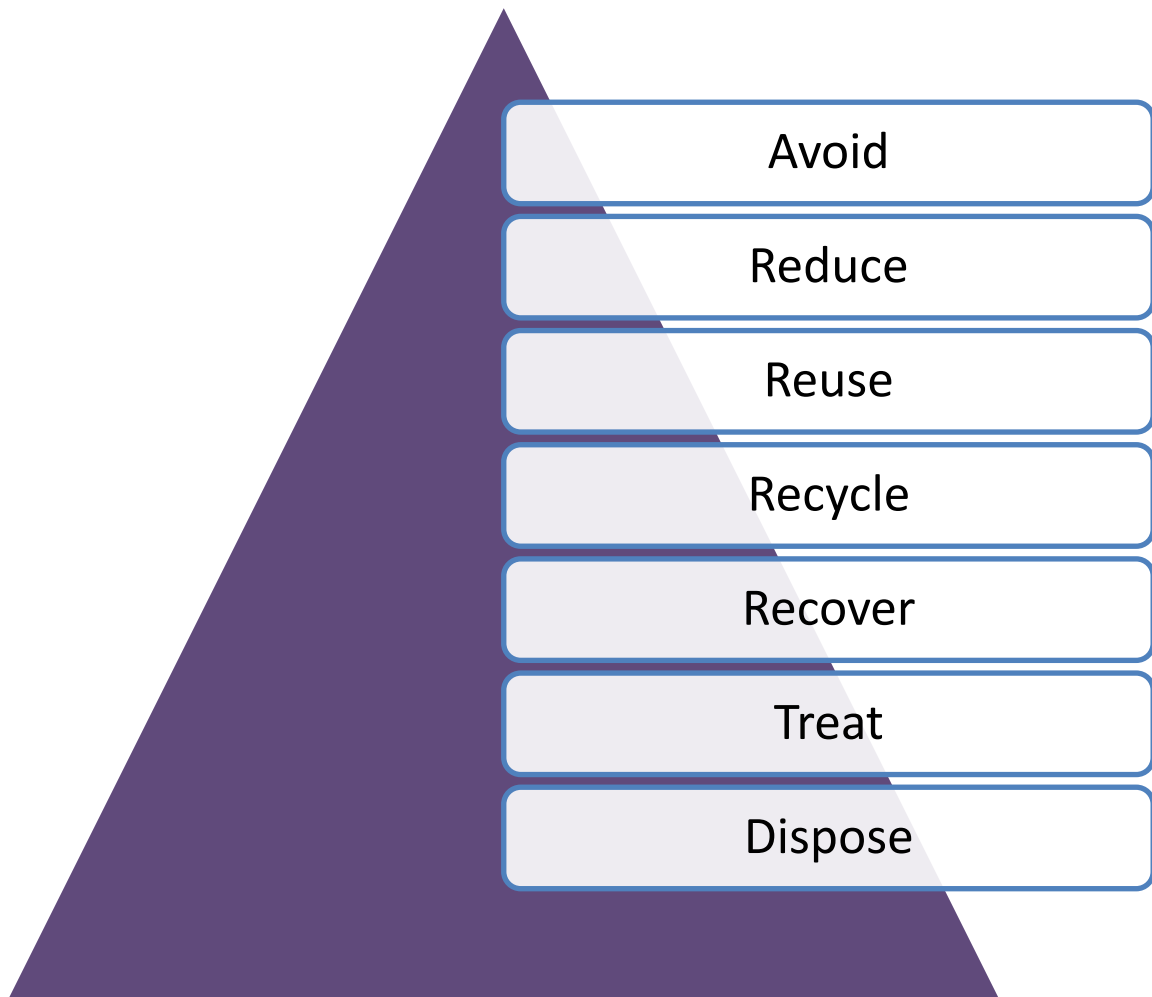


Figure 13 The Waste and Resource Management Hierarchy, Queensland Waste Avoidance and Resource Productivity Strategy (2014 - 2024)

5. Key Strategic Focus Areas and Action Plan:

Key strategic focus areas have been developed to merge the implications of the waste management service drivers and the impacts of Mareeba Shire's waste generation trends on its waste infrastructure and services.

These strategic focus areas will lead to action items that outline the waste infrastructure and service needs and any business planning actions necessary to ensure a financially sustainable and community minded waste management service for Mareeba Shire.

The strategic focus areas and key objectives are:

➤ **Waste Reduction:**

Encourage and support the community to reduce waste generation and to divert recyclable commodities from landfill.

➤ **Circular Economy Opportunities:**

Advocate for the establishment of secondary resource processing markets into our region.

➤ **Waste Infrastructure:**

Ensure infrastructure is equipped to responsibly process wastes streams and resources into the future to provide an essential environmental health service for the community.

➤ **Littering and Illegal Dumping:**

Minimise the impact of littering and illegal dumping on the environment and our community.

➤ **Community and Regional Partnerships:**

Foster partnerships with local governments, community organisations and private entities to provide cost effective arrangements consistent with the strategic focus areas.

➤ **Council's Own Waste:**

Provide leadership in waste management within the shire in recognising Council's own contribution to the waste generation volumes and to identify and implement opportunities to divert wastes from landfill.

5.1. Waste Reduction

The MSC current waste profile and waste generation trend clearly indicates that measures must be taken to try and prevent the volume of waste that will require processing and treatment within 10 years. At a minimum, waste reduction is necessary as a prudent financial measure to prevent the burden of cost to the community from transport and landfilling.

The Queensland's Waste Strategy 2014 – 2024 sets targets aimed at tackling waste generation and optimising opportunities for recovering, reusing or recycling material. While it is possible that these targets may be reviewed by the current and future State governments, MSC understands that the adoption of the target is currently voluntary, and therefore, in the absence of internally driven targets, those contained within the state strategy for rural and regional areas provide a useful guide. The targets are summarised in Table 6 below.

Measures to achieve these waste reduction targets can be realised through source separation, resource recovery at WTSs and through key behaviour education and management in community. These actions are outlined in Table 7 (Action Plan).



Figure 14 Waste reduction measures are required for kerbside collections

Table 6 MSC Waste Reduction Targets

Waste Stream	Measure	Qld 2012-13 recovery baseline	MSC 2015 baseline	Qld 2024 target	MSC 2024 targets
All general waste	Reduction in per capita generation	1.9 tonnes general waste per person per year	Total: 1.45T/pers/year;	Reduce (by 5%) to 1.8 tonnes per person per year	5% reduction/ person / year: Total: 1.25T/pers/year
Municipal solid waste (domestic)	Improved recycling rate	33% state - 37% metropolitan - 30% regional centre	0.003T/person/yr	50% state - 55% metropolitan - 45% regional centre - Improve practices as much as practicable for remote areas	Mareeba & Kuranda 45% Elsewhere - Any positive increase.
Commercial and industrial waste	Improved recycling rate (not including regulated waste recycling eg cooking oil, waste oil)	42% state	1.47T /person/year C&I with no recycling.	55% state	55%*
Construction and demolition waste	Improved recycling rate	61% state	893T	80% state	80%*
Landfill diversion target	Reduction in the amount of waste going to landfill	4,675,000 tonnes to landfill	4264T landfilled to Mareeba Landfill	Reduce by 15% over life of strategy	15%*
Problem or priority waste wastes	Improved management of each waste	Individual baselines to be developed		Individual measures to be developed	Divert as regional opportunities arise

Although MSC is set to reach this target before 2024, the rate of recycling is low and efforts can be made in this area.

* Noting that Council does not provide a C&I waste collection service but can advocate for increased recycling rates through pricing incentives.

5.2. Circular Economy Opportunities

The circular economy approach aims to keep waste materials being recycled in the economy at their highest value use for as long as possible. Where waste generation avoidance and reduction is not achievable, circular economy thinking addresses the next tier approach in the waste management hierarchy; reuse and recycling.

There are economic benefits in the Circular Economy where the Queensland Treasury (2018) found that for every 10,000 tonnes of waste recycled; at least 9.2 jobs are created. Comparatively, for every 10,000 tonnes landfilled, there are only 2.8 FTE jobs produced. Likewise, it is expected that diversion and recycling activities will produce financial savings post 2020 with the closure of Mareeba Landfill. Diversion activities will also become more important when the Queensland waste levy be reintroduced.

Actions to maintain resources within the circular economy include diversion from landfill, enhancing opportunities for recycling and encouraging secondary markets in the region, Table 7 . Mareeba is ideally located to seize opportunity for its community in this growing industry. Its proximity to surrounding Councils and to the agricultural sector particularly lends itself to locating a major organics processing facility within the shire. Recycling jobs are sustainable jobs covering a cross section of technical, commercial and operational skill sets and the industry is continuing to grow. Between 2013 - 2018 the waste management industry has grown by 0.7% (ibisworld.com.au, 2018)

Initiatives such as business reviews or value adding are required to make green waste processing more viable and able to be produce a marketable product, especially in light of potential landfill bans on the product.

5.3. Waste Infrastructure

There is an overarching need to update the waste asset register to adequately capture the true cost of depreciation and not overestimate any surplus. This was identified in the Pacifica Report.

5.3.1. Mareeba Landfill

Mareeba Landfill is the last remaining Council operated engineered landfill servicing the Atherton Tablelands, Cairns Regional Council and Douglas Shire Council regions. This landfill, being managed under the WDA, is set to receive a final cover system at the expiry of the contract in 2020.

By 2020, MSC must either cease landfilling activities and have an upgraded waste transfer station ready or have a new cell ready to service its own WTS dry bulky waste (until 2026) and to continue to receive C&I waste.

Post closure, the final landform of the capped Mareeba Landfill will potentially provide opportunity for value adding through solar farming and greenhouse gas reduction schemes such as the current Emission Reduction Fund. These technologies and funds have the ability to offset operational costs associated with post closure.

5.3.2. Mareeba Waste Transfer Station

Mareeba Waste Transfer Station, located on the Mareeba Landfill site currently receives a high volume of traffic (est. 1600 vehicle movements per week) and processes just under 400t per week in addition to the WDA process waste from SUEZ.

The Mareeba Waste Transfer Station has reached operational and physical capacity and exceeds its capacity on weekends. The transfer station requires upgrade as soon as practicable due to the following existing reasons:

- The bins are overflowing on the weekends with excess waste left on the floor around the bins which is then double handled to the landfill on Monday mornings.
- The tipping floor is frequently at capacity and has no contingency space for truck breakdowns or for disaster events.
- The traffic management has been deemed as an unacceptable risk as it can be difficult to manoeuvre through the site and potential conflicts with trucks, machines and vehicles.
- The gate house is very small and does not provide safety for the operator.
- There are no ready-made areas for stockpiling of individual recyclables as services are made available to Mareeba (e.g. current e-waste area). This can lead to contamination of the commodity and potential non-acceptance by the recycling agent.
- The ability to supervise customers as they unload their waste is required, especially on weekends. Currently MSC rostered staff spend most of the day cleaning up and separating contamination from waste stockpiles and bins despite customers receiving clear instructions at the gatehouse. The current layout of the WTS does not allow for efficient supervision.
- The leachate from the tipping floor undergoes no treatment prior to being irrigated on adjacent gardens.

These issues will be heavily compounded as waste generation volumes increase and will have an unacceptable public health risk. Upon the expiry of the WDA, the transfer station will also require capacity to process the waste streams that would have been landfilled prior.

5.3.3. Other Waste Transfer Stations

Little to no infrastructural changes are expected for the other waste transfer stations except Kuranda. There is ample space at all transfer stations and the stations are meeting the needs of the community. At Kuranda, it is expected that further recycling and diversion activities will commence over the next ten years, as is the trend now, and that planning will need to commence towards the end of this period for a reconfiguration. It would be prudent to time the concept planning before the expiry of the 1396 Waste Management Contract.

5.3.4. Chillagoe Landfill

The current site development plan for the Chillagoe Landfill is for the development of future trench cells. Financial modelling has been completed and has identified that the development of the site into a transfer station is the more financially sustainable option.

Like Mareeba Landfill post closure, the Chillagoe landfill may also provide an opportunity to solar farm.

5.3.5. Recycling Hubs

With no community desire to pay for kerbside recycling but a need to divert and segregate recyclables due to the rising cost of landfilling, an effective alternative collection models should be explored. Recycling hubs have proven effective in other centres and may be complimentary to the CRS refund point network. The Kuranda recycling hub has proven effective with acceptable contamination rates. Recycling hubs will also compliment the Container Refund Scheme.

5.4. Littering and Illegal Dumping

Littering and illegal dumping are disruptive to Council's activities in that waste must be cleaned up to avoid safety issues and environmental harm. Investigation and removal of illegal waste and littering is resource intensive and there is an associated cost.

Littering and illegal dumping reports are investigated by Council and result in two scenarios:

1. Evidence is obtained of the responsible party and an infringement notice is issued under the Waste Reduction and Recycling Act and Regulation.
 - More frequently this scenario in Mareeba shire involves municipal solid waste.
2. No evidence is obtained and Council cleans up the waste at its own cost. Photos are taken and the waste is removed to the closest waste transfer station.

Council is to be mindful that costs over \$5000 can be reimbursed under the Orphan Incidents Reimbursement Scheme administered by the Queensland Department of Environment but is conditional e.g. reimbursement will not cover local government officers time or illegally dumped tyres.

Data capture of illegal dumping is limited to Council's Customer Request Management (CRM) database and an activity code for human resource cost capture. CRM records are to note the volume cleaned up and the time spent on that activity. Likewise, the disposal or waste transfer cost to Council is consumed in the total operational spend for waste services.

Council anticipates an increase in illegal waste dumping and littering with the introduction of the proposed State waste levy. Better records will be required to advocate for reimbursement for clean-up of illegal waste dumping due to the introduction of the State waste levy.

Chewko Road is the site of an old landfill and is subject to illegal dumping. Over the last decade, Council have placed boulders and the state government has erected signage. There is some circumstantial evidence that this signage resulted in some decrease in dumping.

In any compliance effort, education is always a good first step and would be a sound pre-emptive action to take prior to the State's waste levy coming into effect. Better signage regarding illegal dumping would be beneficial.

5.5. Community and Regional Partnerships

5.5.1. FNQROC

MSC is a member of FNQROC and participates in the Waste Management Subgroup to collaborate and make informed decisions regarding the future development and improvement of the region's waste and resource recovery sector. A platform for waste management collaborations between FNQROC Councils was set by the Arcadis Report which detailed a regional situational analysis and identified priority regional waste streams and opportunities.

Arcadis found that all councils in the region struggle with access to secondary markets and transport costs, and the increasing costs and difficulties in developing new waste infrastructure. Other issues included concern about affordable landfill airspace, limited infrastructure and small, dispersed population bases, and that these all impact on a council's ability to deliver and operate viable networks of resource recovery facilities to achieve strategic ambitions.

MSC will continue to work together in a cooperative, coordinated and proactive manner as membership in FNQROC provides MSC with the opportunity to create economies in scale for waste and resource recovery initiatives evidenced by the regional contracts for ferrous scrap metals, used lead acid batteries and biosolids. MSC views the priorities and actions outlined in the Arcadis Report as new opportunities to expand upon these collaborations and consider them to be consistent with its key strategic areas and action items.

5.5.2. LAWMAC

LAWMAC provides an opportunity to participate and interact with other local government authorities and waste management industry professionals in the spirit of knowledge sharing and best practice waste management. As such, MSC will continue to hold membership with this waste body whilst it is advantageous to Council's corporate knowledge.

5.6. Council's Own Waste

Council recognises that it is a leading community organisation and that it has a role to play as a leader and promoter of waste minimisation and recycling, not just in the services provided to its residents but also in the waste generated through its own activities.

To do this MSC works internally within its functional areas to raise awareness, identify unnecessary waste generation and work to implement initiatives to reduce, reuse and recycle.

6. Action plan

The following action plan, summarising the actions from the Key Strategic Focus Areas abovementioned and will guide the short, medium and long-term management of waste in the Mareeba Shire.

Whilst these timeframes are intended to assist in prioritising decisions, actions and infrastructure investment, it is recognised that the waste management industry is always changing and a degree of flexibility is required to accommodate Council's operational, resource, environmental and social constraints. It is also by no means an exhaustive list of actions that Council may undertake over the next years, as new unforeseen opportunities may arise. As such, the action plan is to be reviewed at least every 3 years.



Figure 15 Upgraded Kuranda Waste Transfer Station 2017

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