Executive summary

Background

Paper Australia Pty Ltd (ACN 061 583 533) (also known as 'Australian Paper' or 'AP') is proposing to develop an Energy from Waste (EfW) plant within the existing AP Maryvale Pulp and Paper Mill Site, based in Maryvale, Victoria (refer Figure E.1). The aim of the proposed EfW Plant (the Project) is to allow AP to attain a sustainable, long-term and stable alternative baseload energy source to provide steam and electricity for the existing Maryvale Pulp and Paper Mill (Maryvale Mill), which has been in operation since 1938.

The Maryvale Mill currently purchases approximately 6 petajoules (PJ) of natural gas and 30 megawatts-electrical (MWe) of electricity from the National Electricity Market (NEM) annually. Despite considerable investment in recent years to improve its energy efficiency, the substantial price increases in the market price of both natural gas and NEM supplied electricity has put significant pressure on the Maryvale Mill's ability to operate profitability.

AP is proposing to develop an EfW plant to reduce its exposure to increasing energy market costs. Having considered the total potential costs (capital and operating) involved, the environmental impacts, social benefits, employment effects and plant performance and reliability, as compared with other alternative energy sources, the EfW combustion technologies (utilising Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) feedstock) were deemed by AP to be the most appropriate alternative energy source for its business, with the additional benefit of being successfully utilised on a global scale..

By providing energy (electrical and steam) for the Maryvale Mill, the Project will enable up to 4 PJ of natural gas and up to 30 MWe per annum to be used by the broader market, helping to improve energy security for both the local region and state. Electricity that is produced in excess of the Maryvale Mill requirements will be provided back to the NEM, which will further help increase supply for the broader market.

The Project will lead to new employment during the construction (approx. 1600 Full Time Equivalent (FTE) jobs) and operations phase (approx. 440 FTEs). The Project will also assist in the ongoing viability of the Maryvale Mill and provide improved security for the Mill's 850 direct employees as well as flow-on employment for the local and regional communities.

The Maryvale Mill is currently licenced by EPA Victoria for discharges to the environment and is deemed a 'Scheduled Premises' in accordance with schedule categories A05 (Landfills), F03 (Paper Pulp Mills), and A07 (Composting) under the *Environment Protection (Scheduled Premises and Exemptions) Regulations 2007*. A Works Approval Application (WAA) is required for the Project pursuant to Section 19A of the *Environment Protection Act 1970* (EP Act), with the existing Licence likely being amended to include the EfW plant and the additional scheduled category – A08 (Waste to Energy).

It is important to note that the Project is currently in the feasibility phase and there are a number of design parameters that have yet to be fully developed. The next phase of the Project involves the appointment of an EPC (Engineer, Procure, Construct) contractor to progress the detailed design and subsequent final design and construction of the Project (should the project proceed).

A summary of each of the relevant environmental impacts considered as part of the WAA is described in this Executive Summary.

Figure E.1 : Project Location

Australian Paper Energy from Waste Feasibility Study

Legend

- ● Population centre
- Maryvale Mill
- Project Area
- LGA Boundary

N

RO097400

GDA 1994 MGA Zone 55

0 1 2 Kilometers

DATA SOURCES
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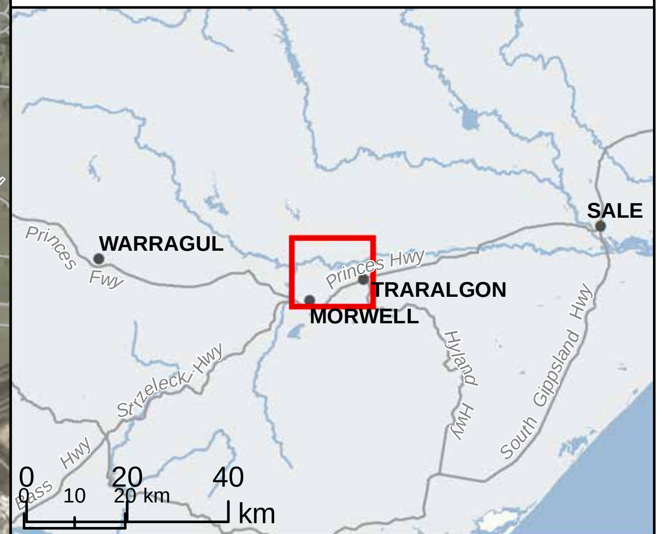

Australian Paper

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Date Published: 14 Feb 2018

Project benefits

If successfully implemented, the Project will have a range of important benefits for the local community and for the local region and state, including:

- Helping to secure the future of the Maryvale Mill and the jobs of the 850 direct employees
- Providing an estimated 1,600 FTE jobs during the construction phase and 440 FTE jobs during the operational phase
- Diverting 650,000 tonnes (+/- 10%) of waste from landfill each year, to a higher order use as per the Waste Hierarchy
- A net reduction in greenhouse gas emissions of approximately 550,000 tonnes per year, the equivalent of taking more than 100,000 cars off the road
- Improving energy security by significantly reducing natural gas usage at the Maryvale Mill by up to 60%, thereby returning up to 4 PJ of natural gas per annum and up to 30 MWe of electricity to the broader market, helping to improve energy security and reduce demand for the local region and state.

Environmental best practice

An environmental best practice assessment for the Project was conducted in accordance with EPA Publication 1517 Demonstrating Best Practice – Guideline (February 2013) and a number of the State Environment Protection Policies (SEPP) that reference the requirement to demonstrate best practice.

Key components of the design approach demonstrating application of best practice include:

- The adoption of environmental and sustainability principles and the use of multi-criteria assessments during the optioneering selection phase for key processes
- Boiler technology optioneering study undertaken in the pre-feasibility stage which compared the comparative merits of moving grate combustion with source separated waste against fluidised bed combustion with mechanically treated waste. The study concluded that the moving grate technology was clearly the most technologically, environmentally and commercially proven technology for treating MSW and C&I waste and would offer the lowest technical and environmental risk for the Project
- The Project has also been sited adjacent to, but within the grounds of, the existing Maryvale Pulp and Paper Mill facility, which has an existing and adequate buffer zone in place. By co-locating with an industrial facility and supplying steam and electricity this yields superior energy efficiency (approx 58%) due to the supply of Combined Heat and Power (CHP) over a standalone electricity generator (27%)
- Site selection workshop evaluated the positioning of the Project at the Maryvale Mill to achieve the lowest social, environmental and economic impact
- Orientation of the site layout with consideration of adjoining sensitive land use and on-site health and safety requirements (e.g. air and noise emissions).

Waste management is also important in demonstrating best practice and is one of the eleven principles of environment protection contained in the *Environment Protection Act 1970* (EP Act). As the MSW and C&I wastes to be utilised will be residual (i.e. post source separation for reuse or recycling), **Recovery of energy** from waste is a higher order waste management option than **Disposal** (landfill) as shown in Figure E.2, helping address the economic issue of waste being a lost resource. In addition, the **Recycling** of metals (~3% of feedstock mass) from the bottom ash and the intended development of bottom ash **Recycling** (~20% of feedstock mass) as a replacement for road base and/or aggregate for concrete products could result in up to 96% diversion from **Disposal**. Landfills also impact the environment and communities long after they have stopped receiving waste.

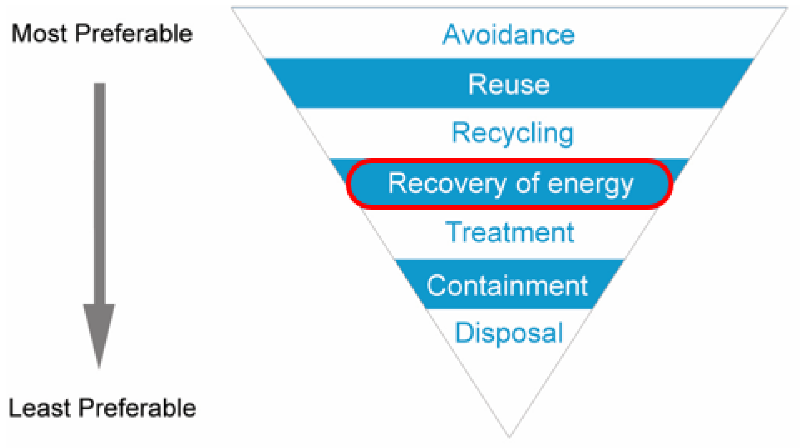

Figure E.2 : Waste hierarchy showing the order of preference and where EfW is placed (EPA 2017

Environmental management

The primary management framework for delivery of the Project is the Australian Paper integrated Maryvale Operations Management System (OMS). The OMS provides a structured framework for effective environmental, health and safety practices and performance across all of APs' activities and operations, including developing management plans and procedures for implementation during the development of the Project.

Site or phase specific management plans will be developed to describe how significant impacts will be addressed during specific phases of Project development (i.e. construction, commissioning and operation), including development of a Construction Environmental Management Plan (CEMP) and Operations Environmental Management Plan (OEMP).

Additionally, detailed risk assessments have been conducted to identify the key environmental risks for the construction and operational phases. These risks and associated controls or mitigation measures will be incorporated into the CEMP and OEMP as appropriate.

Community engagement

AP is well known to the local community; it is a major employer in the region, is active in the community, and has existed on the Maryvale site since 1938. Through the engagement and consultation efforts undertaken to date, the community has shown significant interest in the Project and what it means for the local area and region. As the Project is important to the long-term viability of one of the region's largest employers, the local community are one of a range of stakeholders that have significant interest in the proposed development, and Australian Paper is working closely with them to understand their views and address any concerns.

The potential for an EfW project was first discussed with community members through the 'Maryvale Community Consultation Committee' (MCCC) in May 2017. The MCCC was established in 1994 by AP to provide a regular interface between AP and representatives of the community. Since then, AP has undergone a series of engagement activities to inform the community of the proposed Project, to listen to the opinions and concerns of stakeholders, and address any issues raised. This consultation has involved a number of community focus groups to gauge the community's views on an EfW plant for the Maryvale Mill, and the establishment of an information centre in Morwell. Key issues about the proposed Project and its operations raised during these activities have included air quality, odour, social impacts, community engagement, noise, waste management and water quality.

AP maintains a good reputation in the region surrounding Maryvale based on a strong history of stakeholder engagement with regular interactions between AP representatives and the community. For the proposed Project, AP will continue these interactions and address the key issues raised about the Project and its operations with further community engagement.

Other project approvals

Construction and operation of the Project is subject to a number of statutory and development approval processes and considerations, in addition to the EPA Works Approval Process. Each such process is contained within State and / or Commonwealth legislation and covers environmental and other aspects. The table below lists the other key environmental statutory processes that are applicable to the Project.

Approval	Legislation	Regulator	Description
Commissioning Approval (30A)	*Environment Protection Act 1970* (Vic)	Environmental Protection Authority (EPA)	Subject to Works Approval, AP will need to apply for a commissioning approval (during construction of the plant) to allow for emissions during the commissioning phase of the Project.
EPA Licence Amendment	*Environment Protection Act 1970* (Vic)	EPA	Subject to WAA, AP will apply for an amendment to their existing EPA Licence prior to, or during early commissioning of the plant, so that initial plant monitoring data (such as air quality results) are available to establish EPA Licence limits.
Planning Permit	*Planning and Environment Act 1987* (Vic)	Latrobe City Council	A planning permit is required for buildings and works to facilitate the EfW plant within the Industrial 2 Zone.
Bushfire Management Overlay	*Planning and Environment Act 1987* (Vic)	Country Fire Authority (CFA)	The planning permit application is required to be referred to the relevant fire authority being the CFA pursuant to Clause 66.03 (Referral of permit applications under other State standards provisions) of the Latrobe Planning Scheme. Referral to the CFA is triggered under the Bushfire Management Overlay (BMO). However, referral of the application to the CFA is not required if the applicant satisfies Council that the CFA has: • Considered the proposal for which the application is made within the past three months • Stated in writing that it does not object to the granting of a permit for the proposal.
Major Hazardous Facility	*Occupational Health & Safety Act 2004* (Vic)	WorkSafe Victoria	The Maryvale Mill operates under licence as a Major Hazard Facility. There is a requirement to notify WorkSafe of any proposed changes to the site's Safety Case. This notification is in progress. This WAA may also be referred to WorkSafe Victoria. The EfW Plant will be using natural gas, a schedule 9 material, which will require a review of the Safety Case, along with consideration of the impact of the new plant on the site's MHF risk profile.

Key environmental aspects

Air quality

An air quality impact assessment was undertaken for the Project in accordance with the SEPP(AQM), European Union Industrial Emissions Directive 2010/75/EU (IED) and EPA guidelines for the use of the regulatory model, AERMOD (EPAV, 2014a; EPAV, 2014b). Details of the assessment methodology were discussed and agreed with the EPA prior to commencing the assessment.

The application of best practice was considered in the assessment (EPAV, 2017) and the potential air emissions were analysed and estimated following the EPA's guidelines: *Energy from waste* (EPA, 2013a), and *Recommended separation distances for industrial residual air emissions* (EPA, 2013b).

Key components of the AERMOD modelling assessment methods were:

1) Use of AERMOD in accordance with EPA (2014b)

2) Creation of AERMOD meteorological data in accordance with EPA (2014a) including the use of a five-year dataset of hourly meteorological parameters.

A number of conservative assumptions were built in to the modelling data in order to provide factor of safety to ensure that the proposed EfW Plant will meet the IED and SEPP (AQM) requirements. These assumptions include:

- Inclusion of already-closed industrial facilities into the background air quality data, such as Hazelwood Power Station, Morwell Power Station and the Energy Brix briquette factories
- Inclusion of the existing Australian Paper gas-fired boilers into the background air quality data – this is conservative because the purpose of the EfW Project is to reduce the use of these boilers
- Modelling the particulate matter 2.5 ($PM_{2.5}$) as 100% of the entire mass fraction of total particulate matter being emitted from the EfW Plant at the maximum IED limit of 30 mg/Nm^3. Modelling of $PM_{2.5}$ was also performed using a more representative figure of 0.02 mg/Nm^3, which itself is still a conservative value given that the Ricardo-AEA report[1] states this figure (0.02 mg/Nm^3) is the average maximum emission from sampled UK EfW plants.

Higher risk air pollutants were identified from a review of the proposed EfW operations; they were: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 2.5μm ($PM_{2.5}$), hydrogen fluoride (HF), hydrochloric acid (HCl), ammonia (NH_3), and polycyclic aromatic hydrocarbon as Benzo(a)pyrene (PAHs as B(a)P). Highest risk metals were determined by quantitative risk assessments to represent a larger group of elements; they were: hexavalent chromium (Cr(VI)) and cadmium (Cd). Model results for most of the International Agency for Research on Cancer (IARC) Group 1 carcinogens (such as chromium Cr(VI) and cadmium Cd) showed that the GLCs due to the EfW Plant are many times below the relevant SEPP Design Criterion (limit). It will be important to monitor the elemental composition of the in-stack concentrations to confirm that the proposed EfW operation will not cause significant air quality impacts at any sensitive receptors in Maryvale, Morwell and Traralgon.

With respect to Industrial Residual Air Emissions (IRAEs), there is no set separation distance for such facilities, rather they are required to be assessed on a “case by case” basis. For the Maryvale Mill, there is an existing buffer zone in place, which is approximately 3km around the Mill. This is considered adequate for the proposed EfW Plant.

The assessment concludes that the emissions to air from the proposed EfW Plant are minimal, with no adverse air quality impacts anticipated – Table E.1 shows the key emissions from the EfW Plant and the compliance with SEPP (AQM). Emissions from the EfW Plant will meet all IED and SEPP (AQM) emission limits. The AERMOD results for the EfW Plant’s operating scenario demonstrated there were no predicted exceedances of SEPP(AQM) Design Criteria for any of the grid receptors and for any of the discrete receptors, with the exception of (the combined background and stack emissions of) $PM_{2.5}$.

The exceedances for $PM_{2.5}$ are due to the existing high background levels of $PM_{2.5}$. The peak $PM_{2.5}$ exceedances are highly likely to be associated with elevated smoke levels that may have originated from bushfires, landholder burning off, forest regeneration burns and planned burning. Smoke is often persistent in the Latrobe Valley in autumn due to the stable atmospheric conditions at that time of year as demonstrated in the time series plots. The time-series plots show that the contribution of the EfW Plant to $PM_{2.5}$ ground level concentrations is minimal in comparison to the periodic high $PM_{2.5}$ background levels.

The assessment showed that existing background $PM_{2.5}$ levels are above the design criterion for some periods as shown in a time-series plot analysis. AERMOD modelling was also conducted on a scenario where there

[1] Ricardo-AEA Ltd (Buckland, Thomas), *Assessment of particulate emissions from energy-from-waste plant, National Atmospheric Emissions Inventory, Report for DEFRA, 14/10/2015. https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1511261133_AQ0726_PM_EfW_emissions_report_Issue1_Final_including_appendices.pdf , assessed*

were zero EfW Plant $PM_{2.5}$ emissions (i.e. only background) which showed exceedances of SEPP(AQM) Design Criteria. Additionally, AERMOD modelling was conducted using a high in-stack $PM_{2.5}$ emissions concentration (30 mg/m^3) and a low in-stack $PM_{2.5}$ emissions concentration (0.02 mg/m^3). The difference in resultant GLCs between the 30 mg/m^3 case, the 0.02 mg/m^3 case and the zero emissions case was negligible providing further confirmation that the $PM_{2.5}$ exceedances are due to the high background $PM_{2.5}$ levels.

The conclusion of the air quality modelling assessment is there is a low risk of air quality impact from the Project's EfW emissions. Although the Project has only a very small effect on the high $PM_{2.5}$ background levels, $PM_{2.5}$ should be monitored to confirm compliance of the Project's predicted very minor effect on $PM_{2.5}$ levels.

Table E.1 : Statistical summary of AERMOD results for 99.9 percentile hourly averages, GLCs (µg/m^3)

Substance & assessment	AP Maryvale 2016	BoM LVA 2016	BoM LVA 2015	BoM LVA 2014	BoM LVA 2013	BoM LVA 2012
Carbon monoxide: SEPP(AQM) CO Design Criterion – 29,000 µg/m^3						
Summary of CO results – all GLCs substantially less than the SEPP(AQM) design criterion						
CO, 99.9% 1h; 9th-highest from 'Top 100 Table'	2,527	2,559	2,036	6,343	ND	ND
CO, 99.9% 1h; grid maximum	1,607	1,616	1,490	3,432	ND	ND
CO, 90th percentile grid result	1,489	1,490	1,264	3,432	ND	ND
CO, 99.9% 1h; discrete receptor maximum	1,488	1,497	1,268	3,432	ND	ND
Nitrogen dioxide: SEPP(AQM) NO_2 Design Criterion – 190 µg/m^3						
Summary of NO_2 results – all GLCs substantially less than the SEPP(AQM) design criterion						
NO_2, 99.9% 1h; 9th-highest from 'Top 100 Table'	95.6	79.3	93.4	84.1	84.3	69.1
NO_2, 99.9% 1h; grid maximum	66.2	64.4	71.9	67.85	70.1	62.8
NO_2, 90th percentile grid result	50.8	50.8	55.6	50.76	54.5	49.0
NO_2, 99.9% 1h; discrete receptor maximum	50.8	51.2	56.4	50.8	54.5	49.3
Sulfur dioxide: SEPP(AQM) SO_2 Design Criterion – 450 µg/m^3						
Summary of SO_2 results – all GLCs substantially less than the SEPP(AQM) design criterion						
SO_2, 99.9% 1h; 9th-highest from 'Top 100 Table'	167.0	169.7	155.7	122.4	192.5	230.5
SO_2, 99.9% 1h; grid maximum	72.5	81.1	96.4	92.9	76.0	64.4
SO_2, 90th percentile grid result	70.6	70.9	85.2	89.1	70.6	60.9
SO_2, 99.9% 1h; discrete receptor maximum	70.6	72.9	87.2	90.9	70.6	62.8
Particulate matter 2.5 ($PM_{2.5}$), at emission rate of 30 mg/m^3(IED limit): SEPP(AQM) $PM_{2.5}$ Design Criterion –50 µg/m^3						
Summary of $PM_{2.5}$ results – 9th highest GLCs above SEPP (AQM) design criterion, due to high background $PM_{2.5}$ levels						
$PM_{2.5}$, 99.9% 1h; 9th-highest from 'Top 100 Table'	61.1	60.1	155.7	84.2	ND	ND
Background contribution	59.9	59.9	155.6	84.0	ND	ND
EfW contribution	1.2	0.2	0.3	1.6	ND	ND
$PM_{2.5}$, 99.9% 1h; grid maximum	49.2	47.7	38.4	42.9	ND	ND
$PM_{2.5}$, 90th percentile grid result	47.1	47.1	37.6	40.3	ND	ND
$PM_{2.5}$, 99.9% 1h; discrete receptor	47.1	47.1	37.7	40.3	ND	ND

Substance & assessment	AP Maryvale 2016	BoM LVA 2016	BoM LVA 2015	BoM LVA 2014	BoM LVA 2013	BoM LVA 2012
maximum						
Particulate matter 2.5 ($PM_{2.5}$), at emission rate of 0.02 mg/m^3, as per the average maximum in the Ricardo-AEA Report: SEPP(AQM) $PM_{2.5}$ Design Criterion – 50 µg/m^3						
Summary of $PM_{2.5}$ results – 9th highest GLCs above SEPP (AQM) design criterion, due to high background $PM_{2.5}$ levels						
$PM_{2.5}$, 99.9% 1h; 9th-highest from 'Top 100 Table'	61.1	60.1	155.7	84.1	ND	ND
$PM_{2.5}$, 99.9% 1h; grid maximum	49.2	47.7	38.4	42.9	ND	ND
$PM_{2.5}$, 90th percentile grid result	47.1	47.1	37.6	40.3	ND	ND
$PM_{2.5}$, 99.9% 1h; discrete receptor maximum	47.1	47.1	37.6	40.3	ND	ND
Particulate matter 2.5 ($PM_{2.5}$), for background $PM_{2.5}$ (i.e. EfW Plant emission rate of zero mg/m^3): SEPP(AQM) $PM_{2.5}$ Design Criterion – 50 µg/m^3						
Summary of $PM_{2.5}$ results – 9th highest GLCs above SEPP (AQM) design criterion						
$PM_{2.5}$, 99.9% 1h; 9th-highest from 'Top 100 Table'	59.9	59.9	155.6	84.0	ND	ND
$PM_{2.5}$, 99.9% 1h; grid maximum	47.1	47.1	37.6	40.3	ND	ND
$PM_{2.5}$, 99.9% 1h; discrete receptor maximum	47.1	47.1	37.6	40.3	ND	ND
Ammonia: SEPP(AQM) NH_3 Design Criterion – 600 µg/m^3						
Summary of NH_3 results – all GLCs substantially less than the SEPP(AQM) design criterion						
NH_3, 99.9% 1h; 9th-highest from 'Top 100 Table'	26.6	15.7	15.6	15.5	15.6	14.9
NH_3, 99.9% 1h; grid maximum	10.0	14.4	13.8	13.7	14.0	13.2
NH_3, 90th percentile grid result	4.2	4.2	4.4	4.9	4.4	4.3
NH_3, 99.9% 1h; discrete receptor maximum	4.6	5.1	5.1	5.6	5.2	4.8
Dioxins and Furans: SEPP(AQM) DF Design Criterion – 3.7E-06 µg/m^3						
Summary of DF results – all GLCs substantially less than the SEPP(AQM) design criterion						
DF, 99.9% 1h; 9th-highest from 'Top 100 Table'	8.9E-08	5.2E-08	5.2E-08	5.2E-08	5.2E-08	5.0E-08
DF, 99.9% 1h; grid maximum	3.3E-08	4.8E-08	4.6E-08	4.6E-08	4.7E-08	4.4E-08
DF, 90th percentile grid result	1.4E-08	1.4E-08	1.5E-08	1.6E-08	1.5E-08	1.4E-08
DF, 99.9% 1h; discrete receptor maximum	1.5E-08	1.7E-08	1.7E-08	1.9E-08	1.7E-08	1.6E-08
PAHs as B(a)P: SEPP(AQM) DF Design Criterion – 0.73 µg/m^3						
Summary of B(a)P results – all GLCs substantially less than the SEPP(AQM) design criterion						
B(a)P, 99.9% 1h; 9th-highest from 'Top 100 Table'	0.012	0.007	0.007	0.007	0.007	0.007
B(a)P, 99.9% 1h; grid maximum	0.004	0.006	0.006	0.006	0.006	0.006
B(a)P, 90th percentile grid result	0.002	0.002	0.002	0.002	0.002	0.002
B(a)P, 99.9% 1h; discrete receptor maximum	0.002	0.002	0.002	0.002	0.002	0.002
Hexavalent chromium (highest risk metal): SEPP(AQM) Cr(VI) Design Criterion – 0.17 µg/m^3						

Substance & assessment	AP Maryvale 2016	BoM LVA 2016	BoM LVA 2015	BoM LVA 2014	BoM LVA 2013	BoM LVA 2012
Summary of Cr(VI)results – all GLCs substantially less than the SEPP(AQM) design criterion						
Cr(VI), 99.9% 1h; 9th-highest from 'Top 100 Table'	0.136	0.080	0.080	0.079	0.080	0.076
Cr(VI), 99.9% 1h; grid maximum	0.051	0.073	0.070	0.070	0.071	0.067
Cr(VI), 90th percentile grid result	0.021	0.022	0.023	0.025	0.023	0.022
Cr(VI), 99.9% 1h; discrete receptor maximum	0.024	0.026	0.026	0.029	0.026	0.025
Cadmium (2nd-highest risk metal): SEPP(AQM) Cd Design Criterion – 0.033 µg/m³						
Summary of Cd results – all GLCs less than the SEPP(AQM) design criterion						
Cd, 99.9% 1h; 9th-highest from 'Top 100 Table'	0.027	0.016	0.016	0.015	0.016	0.015
Cd, 99.9% 1h; grid maximum	0.010	0.014	0.014	0.014	0.014	0.013
Cd, 90th percentile grid result	0.004	0.004	0.004	0.005	0.004	0.004
Cd, 99.9% 1h; discrete receptor maximum	0.005	0.005	0.005	0.006	0.005	0.005
Mercury: SEPP(AQM) Hg Design Criterion (organic) – 0.33 µg/m³						
Summary of Hg results – all GLCs substantially less than the SEPP(AQM) design criterion						
Hg, 99.9% 1h; 9th-highest from 'Top 100 Table'	0.044	0.026	0.026	0.026	0.026	0.025
Hg, 99.9% 1h; grid maximum	0.017	0.024	0.023	0.023	0.023	0.022
Hg, 90th percentile grid result	0.007	0.007	0.007	0.008	0.007	0.007
Hg, 99.9% 1h; discrete receptor maximum	0.008	0.009	0.008	0.009	0.009	0.008

Input feedstock

The proposed EfW facility is expected to treat 650,000 tonnes (+/- 10%) of waste per year, consisting of approximately 80% MSW with the remainder being made up of C&I waste (specific sectors only). This feedstock would be collected post source recycling and therefore will not impact on recycling programs or higher order waste hierarchy activities.

The feedstock is expected to be comprised of:

- Residual waste from MSW kerbside collections operated by councils forming part of the Gippsland Waste and Resource Recovery Group (GWRRG) and Metropolitan Waste and Resource Recovery Group (MWRRG)
- Commercial and industrial (C&I) waste, anticipated to be derived from the largest five waste producing sectors within the C&I sector, which are Manufacturing, Retail Trade, Wholesale Trade, Education and Training, and Healthcare and Social Assistance.

Construction Waste

The site preparatory phase of the Project would generate large amounts of excavated material as the facility is to be located into the side of an existing hill feature. It is AP's intention to reuse the excavated material on the EfW Plant site or within the broader Mill site. A material cut and fill balance was derived from 3-dimensional site modelling. The net amount of excavated material / spoil is estimated to be 42,500m^3.

The construction phase of the project would generate wastes typical of an industrial building development (e.g. concrete, steel, etc) with staff compound waste comprising primarily of industrial, office and general waste (a mix of solid inert waste and putrescible waste). Waste avoidance, recycling and resource recovery measures would be implemented to divert resources from landfill in accordance with the waste hierarchy and the principles of Victoria's State Waste and Resource Recovery Policy *Getting Full Value,* where practicable.

Operational Wastes

The Project will result in the generation of a range of solid and liquid wastes, including both industrial (non-hazardous) and prescribed industrial (hazardous) waste (PIW). A waste assessment was undertaken to determine the likely composition of the ash residues generated from the EfW plant, along with AP's proposed approach for handling and managing these different waste types. The waste assessment considered components of the construction and operation of the Project, also addressing the specific requirements of the EPA's EfW Guidance (2013, 2017), Schedule 1 and Schedule 2 of the Environment Protection (Industrial Waste Resource) Regulations 2009 and the Industrial Waste and Resource Guidelines: Solid Industrial Waste Hazard Categorisation and Management (Publication IWRG 631, 2009).

Particular attention was given to the categorisation of the different waste streams that would be handled during the operational phase of the Project, given their volume and composition would have significant impacts on the design of the facility, waste acceptance and handling protocols, plant operational efficiency, and waste transportation and disposal requirements. Key waste types are given below.

The EfW facility will generate a number of residues as part of routine operation, as well as general wastes from the Project overall. The wastes will be categorised, handled, and transported as per EPA Victoria (2009) Publication IWRG631 Solid Industrial Waste Hazard Categorisation and Management.

The residues generated from the EfW plant will fall within three broad categories as summarised from the waste assessment:

- Bottom ash (also known as grate ash), this is the solid residue removed from the combustion chamber after the waste has been combusted and is expected to have a coarse and granular ash consistency, with small amounts of ferrous and non-ferrous metals present which will be recovered as far as practicable. Bottom ash is the largest residue from an EfW facility and will be collected at the end of the grate. It will comprise between 20 to 25% of the weight of the input material, and less than 10% by volume. Initial assessment shows that bottom ash will likely be categorised as 'Industrial Waste', however options for reuse in building and as concrete aggregate material are being investigated
- Boiler ash, the part of the fly ash that is removed from the boiler and the quantity is expected to be less than 1% of the input feedstock. Boiler ash will likely be categorised as either 'Category B PIW' or 'Category C PIW' with the potential for some of the metal species to trip thresholds for Category A
- Air pollution control residues (APCr, also known as flue gas treatment (FGT) residues) from the air pollution control (APC) equipment, typically represent 3.5% of the input feedstock and will likely be categorised as either 'Category B PIW' or 'Category C PIW' with the potential for some of the metal species to trip thresholds for Category A.

Noise

Recommended Maximum Noise Levels (RMNLs) for representative Noise Sensitive Areas (NSAs) were calculated using the methodology in the EPA Guidelines *Noise In Regional Victoria* (NIRV). Predicted noise levels from operation of the Project at the representative NSAs were modelled for all time periods and for both neutral and predominant meteorological conditions. The noise predicted at each property for each of the day/evening/night time periods has been compared against EPA agreed Recommended Maximum Noise Levels. AP has also put forward design targets (noise limits for the EfW Plant) for each of the NSAs.

The noise contribution from the proposed EfW Plant to the overall noise level at the NSAs was found to be negligible. Further mitigation measures to reduce potential noise impacts will be implemented during the detailed design phase. This will consider dominant noise sources, including:

- Noise from the Boiler House
- Water Cooled Condensers (WCCs)
- Truck Noise (on the EfW site).

Typical mitigation strategies that may be applied to reduce noise levels include:

a) Selection of quiet plant and equipment (low noise / non-tonal options)

b) 'Line of sight' with noise sensitive areas reduced as far as practicably possible

c) Application of acoustic attenuation in the form of noise 'barrier' walls or enclosure. The 'barrier' is to have a mass per unit area in the order of 15 kg/m^2 and be contiguous without any gaps

d) Application of acoustic insulating constructions for building door and walls

e) The use of attenuators on extract systems.

The next phase of the project (should the project proceed) will be the detailed design phase and will include an EPC contractor who will drive the design process. It is typically during the detailed design phase where specific acoustic design is conducted and noise mitigation measures are incorporated into the design. This process is iterative and will involve risk and hazard identification (e.g. risk and HAZOP/HAZID workshops) to quantify and manage risks, such as adherence to statutory noise limits.

Greenhouse gas

The greenhouse gas emissions (GHG) for the Project are required to be assessed in accordance with the Protocol for Environmental Management (PEM): Greenhouse gas emissions and energy efficiency in industry (2002) and the State Environment Protection Policy (Air Quality Management) 2001 (SEPP (AQM)). An energy use and greenhouse gas assessment was conducted to determine compliance with the PEM and SEPP (AQM).

The GHG emissions sources are categorised into three different scopes, as per the Greenhouse Gas Protocol (GHG Protocol) issued by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI):

- **Scope 1** – Direct emissions from sources that are owned or operated by a reporting organisation (examples – combustion of fuel used in on-site power generators)
- **Scope 2** – Indirect emissions associated with the import of energy from another source (examples – purchases of electricity)
- **Scope 3** – Other indirect emissions (other than Scope 2 energy imports) which are a direct result of the operations of the organisation but from sources not owned or operated by them (examples include embedded emissions in raw materials and product usage).

The total GHG emissions estimated for the construction phase of the Project is approximately 15,000 tonnes of carbon dioxide equivalent (CO_2e), much of which is embedded emissions within the purchased material or offsite manufacturing (Scope 3 emissions). During operations, the total Scope 1 emissions (Direct emissions from combustion of waste) and Scope 3 (predominantly incoming waste logistics) is estimated at approximately 360,000 tonnes of CO_2e. However, the GHG emissions from displaced heat/steam and electricity (Scope 2) produce a significant offset in the Project's overall emissions of approximately -380,000 tonnes of CO_2e per annum to give a total estimate of approximately -20,000 tonnes of CO_2e annually and approximately -500,000 tonnes of CO_2e over the 25-year design life of the Project.

Further improvements in the GHG performance of the Project are demonstrated when non-energy related GHG for the diversion of landfill are considered, in-line with the PEM. The cumulative emissions summary shows that the Project is expected to reduce the Maryvale Mill's emissions by approximately 540,000 tonnes of CO_2e per year and by 13,500,000 tonnes of CO_2e over the 25-year design life.

	Construction emissions (tCO_2e)	Operation Energy-related emissions (tCO_2e)	Operation Non-energy related emissions (tCO_2e)	Total emissions (tCO_2e)
Construction	14,606			14,606
Years 1-25 (annual)		-20,400	-523,531	-543,931
Total (25 years)	**14,606**	**-510,001**	**-13,088,284**	**-13,583,678**

By comparison, landfill of the waste alone would result in emissions of 500,000 tCO_2e per year. This will be a measurable impact on Victoria's (and therefore Australia's) emissions profile.

The emissions profiles of Victoria and Australia (and the proportion reduction that the Project would represent) are (for 2015 – latest dataset available):

- Australia – 537,851,000 tCO2e / year – 0.1% reduction
- Victoria - 119,589,000 tCO2e / year – 0.4% reduction.

Water use and water impacts/discharges/management

The Project will source its raw water resources from the Moondara Reservoir and potable water will be supplied by the existing local water authority, Gippsland Water. During construction, there will be a temporary potable water supply available for general construction uses. During operations, it is anticipated that the Project will not significantly increase the amount of water consumed, considering the current water demands of the Maryvale Mill. Water demand is predicted to be approximately 5-6ML of raw water per day depending on the load and operating mode of the EfW plant. The main water uses will be for the cooling and process water systems including cooling tower water make-up, ash handling, flue gas treatment (if a semi-dry system is used), production of demineralised water for the generation of steam, boiler chemistry control and online boiler cleans (soot blowing), and fire service system.

The water to be discharged from the EfW Plant will be minor in comparison to the water discharged from the existing Maryvale Mill. It is estimated that the Project will discharge a maximum of approximately 1ML/day (depending on the load and operating mode of the EfW plant) of waste water and contaminated water, with the majority (70%) consisting of clean waste saline water from the cooling towers, the boilers and raw water filter backwash. The waste water will be directed to the Maryvale Mill's existing waste water treatment system and eventually into the Latrobe River via existing discharge points, under existing EPA licence conditions.

The EfW plant will use the same design philosophy as the existing Mill; i.e. there will be no discharge of process or contaminated water to the environment. Drainage from areas of the Project that could be contaminated by chemicals (thus designated as trade waste) shall pass through a suitably designed local chemical drainage system, storage and treatment system prior to being discharged into the existing trade waste drains which ultimately ends up at the Gippsland Water Factory for final treatment.

The State Environment Protection Policy (Waters of Victoria) 2003 (SEPP (WoV)) sets the framework for the protection and management of the State's surface waters. It identifies beneficial uses and environmental quality objectives that, if met, will ensure the protection and management of the State's surface waters and actions to avoid pollution. As the EfW plant will not discharge process water or contaminated storm water to any surface waters, it has been determined that the Project complies with the SEPP (WoV) requirements for surface water.

Overall conclusion

The proposed EfW plant is a significant project that will provide a suitable baseload energy supply to the Maryvale Mill, which is an important employer in the region. The energy security that will be established from the Project will help AP to continue to operate in an economically viable manner, generate new employment opportunities throughout the construction and operational phases, and bring significant social and economic benefits to Maryvale and the Latrobe Valley region. There will also be a significant reduction in greenhouse gasses produced primarily due to the diversion from landfill of the waste feedstock.

Environmental impacts associated with the Project have been assessed through detailed risk assessments and technical environmental assessments, in order to identify all environmental impacts and provide suitable mitigation measures. These assessments have identified a number of improvements that have been made to the plant design to further minimise the environmental impact of the Project.

Detailed environmental assessments have indicated that the Project will meet the best practice European emission standards (Industrial Emissions Directive 2010/75/EU) and all relevant SEPP requirements. Noise, waste and water impacts are also expected to be negligible. Opportunities to further reduce environmental impacts will continue throughout the detailed design stages.

AP is dedicated to ensuring the Maryvale community and other stakeholders are involved in the Project and early and transparent communications are a core value. A consultation program is already underway which includes regular meetings with local consultative committees and the general public. This program will continue to inform relevant stakeholders of any updates, and to answer any queries or concerns around the Project.