REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE *ENVIRONMENT EFFECTS ACT 1978*

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Impact Assessment Unit (IAU) at the Department of Environment, Land, Water and Planning (DELWP) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once IAU is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
    - a brief description of potential changes or risks to environmental assets resulting from the project;
    - available information on the likelihood and significance of such changes;
    - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A USB copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 10MB as they will be published on the Department's website.**

- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address

Minister for Planning
PO Box 500
EAST MELBOURNE VIC 8002

Couriers

Minister for Planning
Level 16, 8 Nicholson Street
EAST MELBOURNE VIC 3002

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@delwp.vic.gov.au is required. This will assist the timely processing of a referral.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	Cleanaway Operations Pty Ltd
Authorised person for proponent: **Position:** **Postal address:** **Email address:** **Phone number:** **Facsimile number:**	James Pearce Project Director – Waste-to-energy Level 4, 441 St Kilda Road, Melbourne Metro Victoria (Southeast), VIC 3004 James.pearce@cleanaway.com.au +61 459 222 379 N/A
Person who prepared Referral: **Position:** **Organisation:** **Postal address:** **Email address:** **Phone number:** **Facsimile number:**	Jenna Beckett Senior Environmental Consultant Arup 699 Collins Street, Docklands, VIC, 3008 Jenna.beckett@arup.com +61 3 9668 5859 N/A
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	Cleanaway Operations Pty Ltd (Cleanaway) is an Australian waste management, recycling, and industrial services company. Cleanaway is developing a waste-to-energy (WtE) facility in Victoria, known as the Melbourne Energy and Resource Centre (MERC) ('the Proposal'). Cleanaway has engaged the following specialists for the proposed development. Ramboll is engaged as the Technical Advisor to Cleanaway and waste-to-energy process engineering lead consultant. Arup as the Lead Environmental Consultant has conducted a number of draft high-level impact assessments for the Proposal including: • Waste management • Hydrology and flooding • Landscape and visual • Sustainability management • Noise and vibration • Hazardous substances and industrial risks • Architectural concept • Socio-economic.

	Other consultancies engaged for specific environmental assessments for the Proposal include: • Tract – Planning Consultant, preparing the Planning Permit Application • Katestone Environmental – Air Quality Consultant preparing the air quality, climate change and greenhouse gas emissions assessments • Traffix – Traffic and Transport Consultant • enRiskS – Human Health Risk Assessment Consultant • Ecology and Heritage Partners – Ecology and Heritage Consultant, preparing the biodiversity assessment, bushfire risk, kangaroo management and Cultural Heritage Management Plan • Douglas and Partners – Land and Groundwater Consultant • Capire – Stakeholder and Community Engagement Consultant • Arcadis – Waste Flow Consultant.

2. Project – brief outline

Project title: Melbourne Energy and Resource Centre (MERC)

Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context)

The Proposal is located at 510 Summerhill Road, Wollert (VIC) (Lot 10B PP2819), approximately 25km north of Melbourne's CBD. The site is within the City of Whittlesea local government area (LGA) and forms part of the future Northern Quarries Precinct Structure Plan (PSP) area. Commencement of this PSP has not yet been scheduled by the Victorian Planning Authority (VPA), but it is anticipated that this precinct will have an employment focus. Other surrounding PSPs include Shenstone Park PSP, English Street PSP, Wollert PSP, Craigieburn North Employment PSP and Cooper Street West PSP. The site is within the jurisdiction of the Port Phillip and Westernport Catchment Management Authority (CMA).

Refer to Attachment 1 for the proposed location for the MERC.

AMG coordinates for the site are:

- X = 321442.6401
- Y = 5839818.5279

Short project description (few sentences)**:**

<u>Existing approvals pathway</u>

The MERC requires approval under the *Environment Protection Act 2017* (EP Act) and *Planning and Environment Act 1987* (PE Act).

- Under the EP Act a Development License is required. A Development License Application (DLA) is currently being prepared with submission of the DLA to the Environment Protection Authority (EPA) targeted for April 2023
- Under the PE Act a Planning Permit is required. A Planning Permit Application (PPA) is currently being prepared with submission of the application to the Minister for Planning targeted for March 2023.

As part of the DLA and Planning Permit applications, a number of technical assessments are being prepared to inform an understanding of the risk to human health and the environment from the facility.

The full suite of technical assessments being prepared for the DLA and PPA will be exhibited to the public.

<u>Project description</u>

The MERC has been designed to thermally treat a design capacity of 380,000 tonnes per annum (tpa) of waste feedstock. The waste feedstock received at the facility will primarily comprise residual MSW and residual C&I waste (with smaller fractions of other wastes identified as 'acceptable waste' in the Waste Acceptance Protocol). The Proposal will also incorporate maturation and processing of bottom ash to recover recyclable metals, with the intent to utilise the remaining ash as an aggregate in construction.

Residual waste is waste that is left over from recycling and resource recovery operations and the non-recyclable general waste from source separated collections. Source separation involves separating waste into common material streams or categories for separate collection. This separation occurs at the individual household and individual business/institution level. Waste processes at the site will be subject to primary contractual/procedural controls and secondary procedural and operational controls. These controls are detailed in the MERC Waste Acceptance Protocol to ensure that residual waste accepted for processing is in full alignment with the definition of permitted waste given in the *Victorian Waste to Energy Framework* (DELWP, 2021) and to ensure that only appropriate waste that is suitable for thermal treatment is accepted as feedstock.

The WtE process will generate approximately 46.3MW of gross electricity, 4.7MW of which will be used to power the facility itself and the associated on-site by-product and residue treatment processes, with approximately 41.6 MW (328,700 MWh/year[1]) exported to the grid as base load electricity. In addition to supplying electricity to the grid, there is also potential to supply energy in the form of heat and/or process steam to local industrial users or other future on-site waste processing infrastructure.

[1] Based on 8,000 hours of operation at full capacity per year and a 99% climate correction factor to account for a slight reduction in electricity generation when ambient temperatures are higher than average.

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):

WtE using thermal treatment is an emerging resource recovery concept for the management of residual MSW and C&I waste in Australia, however it is a proven and widely used approach to treat residual waste globally with many operational examples located in regional and urban areas.

The primary objective of MERC is to increase resource recovery and minimise the use of landfill disposal. The MERC will support circular economy principles and best practice waste management and uphold the waste hierarchy, which recognises recycling and recovery as higher order actions than disposal. MERC will divert waste from landfill, minimise disposal, support the Victorian Government targets for recycling and landfill diversion, conserve valuable existing landfill airspace and reduce the burden of landfills on the environment and communities. MERC will also recover the energy and non-combustible recyclable materials from the feedstock that would otherwise have been destined for disposal.

In Europe, there is a strong correlation between uptake of WtE, increased landfill diversion and increased rates of recycling, as shown in Figure 1 (CEWEP, 2019). Figure 1 also shows a comparison with Australia data (2021, DECCA). This data shows that best practice municipal waste management can achieve up to 99% landfill diversion (i.e. <1% landfill) through a combination of recycling, composting and WtE, where WtE is used for energy and resource recovery from residual waste. The data also shows that those European countries with the highest rates of recycling and composting, also have the highest levels of WtE, thus demonstrating that WtE, which is focused on residual (non-recyclable) waste, is complementary to recycling and composting within a best practice waste management system.

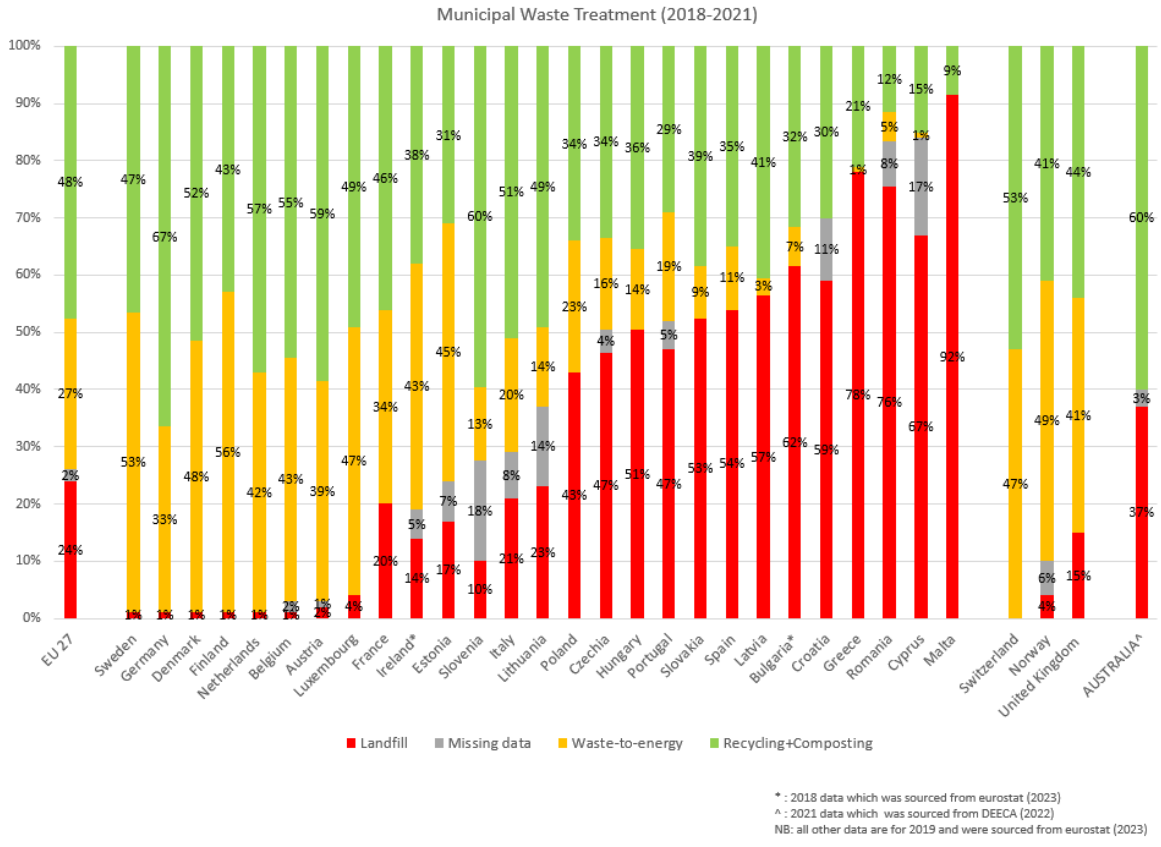


Figure 1: European waste treatment methods, 2019 (CEWEP from Eurostat figures)

Background/rationale of project (describe the context / basis for the proposal, eg. for siting):

Cleanaway provides a range of waste management and resource recovery services across all waste streams (MSW, C&I waste and Construction & Demolition (C&D) waste) in Victoria, covering each level of the waste hierarchy from recycling to landfill operation, except for energy

recovery. The MERC will provide an option for recovery of energy and resources from the portion of waste currently destined for landfill disposal.

The Victorian Waste to Energy Framework (DELWP, 2021) recognises the role of WtE to divert waste from landfills, helping Victoria transition to a circular economy, in line with Victoria's circular economy policy and plan. Recycling Victoria recognises a role for WtE investment and supports WtE facilities where they meet best-practice environment protection requirements, reduce waste to landfill, support waste avoidance, reuse and recycling, and demonstrate social license with affected communities. The Energy from Waste Guideline (EPA Publication 1559, 1 July 2017) states that efficient recovery of energy from the thermal processing of waste is considered a resource recovery as opposed to a waste disposal option. However, the EPA notes that recovery of energy should not compete with avoidance, reuse or recycling.

Key drivers and benefits for developing the MERC include:

- Promoting the management of waste in accordance with the waste hierarchy by promoting higher order management of waste at source and thermally treating residual waste which cannot be viably managed at a higher order, in a manner that is higher than disposal
- Diverting waste away from landfill, achieving a range of environmental benefits. These include reducing the land required across Victoria for waste disposal, which is a well-known issue in Victoria (as recognised in the Victorian Waste to Energy Framework). In addition, landfills in Victoria are reaching capacity, and this alongside no new landfills planned for the state, means an alternative waste management option needs to be developed
- Increasing the recovery of valuable resources such as recyclable metals and construction aggregate from the Incineration Bottom Ash (IBA)
- Providing a source of baseload energy, part of which is categorised as renewable under the *Renewable Energy (Electricity) Act* (2000), contributing to Victorian Government objectives for energy security and renewable energy
- Providing a net reduction in greenhouse gas emissions as part of the transition to net zero
- Increasing community awareness and education (through the provision of a visitor and education centre) on the principles of waste management, avoidance, the circular economy, recycling and resource recovery and WtE
- Contributing to the economy in Greater Melbourne (specifically Wollert) by creating direct and indirect skilled employment opportunities, both during construction and the long-term operation and maintenance of the WtE facility
- With the increasing price of waste disposal (through landfill levies), fossil fuels and alternative production sources, this allows the MERC to be commercially competitive, coupled with a likely plateauing of residual waste generation and increasing energy demand due to population growth.

The environmental benefits of the MERC compared to landfill, include:

- MERC requires a smaller land footprint, thus making better use of valuable land resources
- Risks of soil, groundwater and surface water contamination are avoided as there will be no landfill leachate
- Avoidance of fugitive landfill gas emissions which occur during landfill operation and continue long after the landfill has closed, the methane component of which is recognised to be a much more potent greenhouse gas than carbon dioxide (CO_2)
- Preventing the spread of viruses and pathogens which may be present in the waste streams by using high temperatures to sanitise the waste
- Reduced general amenity impacts such as odour, vermin and pest issues
- Promotion of the proximity principle by treating waste close to the source of waste generation, reducing transport and subsequent carbon footprint impacts
- The MERC can be decommissioned and removed from site, with significantly lower cost to restore and rehabilitate land.

WtE forms part of the solution in the transition to net zero greenhouse gas emissions. As illustrated in Figure 2, WtE (incineration) facilities in Europe avoid a greater amount of greenhouse gas emissions than they emit. This is achieved through several means:

- Reduction of organic waste decomposing in landfill, offsetting the associated methane emissions
- Production of electricity, offsetting marginal generation from other sources (typically fossil fuels)
- Increased recycling rate of metals and IBA aggregate, offsetting emissions involved with the production of virgin materials.

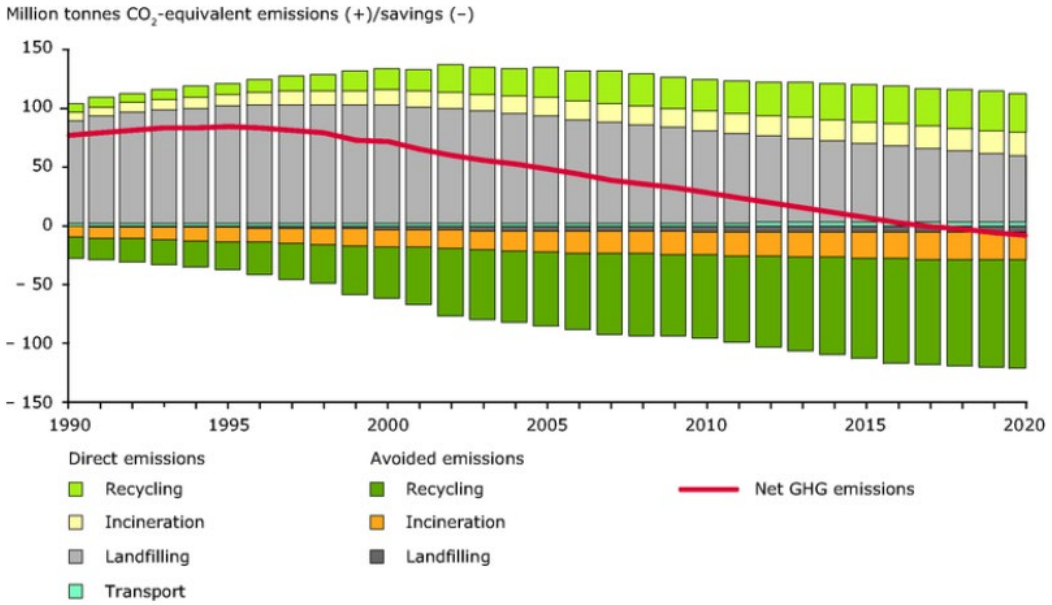


Figure 2: Emissions from MSW management practices in the European Union[2]

Cleanaway undertook a multi-criteria analysis for approximately 200 sites across Melbourne and wider Victoria to determine the location for the MERC. This involved completing a high-level desktop due diligence appraisal of sites, including:

- Red flags appraisal – initial fatal flaws assessment to rule sites in / out for further high-level appraisal. This considered local planning policies, planning zones and overlays, site separation distances to sensitive receptors and access routes to determine the most appropriate location for the facility
- Evaluation of sites against proposed technical, environmental and commercial criteria.

Key questions reviewed for each potential site included:

1. Does the planning zone allow the use?
2. Is the site free of overlays that pose major constraints (e.g., ESO, SLO, VPO, PAO, LSIO, FO, AEO)?
3. Is the Proposal consistent with relevant local planning policies and future strategic planning matters (e.g., Precinct Structure Plans)?
4. Does the site have a separation distance of greater than 1km from sensitive receptor locations (e.g., residents, schools, future residential land etc)?
5. Is the site greater than 3km from an airport?
6. Is the site area greater than 6ha?
7. Is the shape of the site such that it would allow functional facility layout?
8. Is the site located within 2km of an existing major road network?
9. Does the site have any easements or issues associated with external factors that would preclude the site from the planned use?
10. Is the site in a location that could enable connection to utilities?
11. Is the site in a location that is appropriate for securing waste feedstock?

The proposed location for the MERC (510 Summerhill Road) was chosen due to the current land zoning of the site and surrounds, proximity to grid connection (and capacity of the network at this location), access roads and separation distances from sensitive receptors. The central location of

[2] European Environment Agency https://www.eea.europa.eu/data-and-maps/figures/modelled-ghg-emissions-from-msw (GHG emissions after 2008 are projected)

the site means that waste can be received from suburbs in the east, west and north of the greater Melbourne metropolitan area, via existing waste collection and waste transfer infrastructure.

The surrounding existing industrial land uses were a key deciding factor for the proposed location of the MERC. The Barro Group Mountain View Concrete Quarry (known as Woody Hill Quarry) is located approximately 1km north-west of the site. This site extracts, processes and distributes raw materials, including crushed rock, coarse and fine sands and gravels. Austral Bricks Wollert Clay Quarry is located approximately 500m to the south-west of the site (585 Summerhill Road). A Compression Station (owned by APA Gasnet) is located 1km west of the site. Hanson Cement Quarry and Landfill Site, as well as Wollert Waste Management, is located approximately 5km east of the site. In addition, at 430 Summerhill Road, a rectangular rural site to the immediate west of the MERC has approval for future use as a new quarry (Philips Quarry).

The nearest residential areas are Craigieburn (approximately 3km to the west), Epping (approximately 2km to the south), and Mernda (approximately 8km to the east).

Refer to Figure 3 and Section 7 for further detail.

Figure 3: Existing and future land uses surrounding the MERC site

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

The site covers approximately 82ha and is bound by Summerhill Road to the south, and open pastureland to the north, east and west. The site is constrained by several easements and interactions with neighbouring property and uses, including an easement for high voltage power transmission lines, a quarry blast zone, a sensitive use buffer zone and flood affected areas. The siting and design of the facility has considered these constraints when locating buildings at the southern end of the site (as shown in Attachment 2). Areas for future development have been identified as part of the design process and are located along the western edge of the site to avoid interaction with the transmission line easement.

The Proposal has developed a high-level concept design for the WtE process, with further refinement occurring as part of design development and the environmental approvals process.

The Proposal includes building all onsite infrastructure needed to support the facility. This includes:

- Main waste processing building, including the tipping hall, waste bunker, boiler building (utilising moving grate combustion technology), flue gas treatment, residue materials handling and conveyor
- Air pollution control residue (APCr) stabilisation facility
- Incinerator bottom ash (IBA) maturation and IBA processing hall

- Articulated truck parking / truck shed
- A-Doubles decoupling area
- Administration building
- Visitor and education centre
- Electrical switchyard and provision for a third-party substation (by others)
- On-site stormwater management and attenuation
- Internal roadways and staff and visitor centre car parking areas.

In addition, the existing residential property on site will be demolished.

The main civil and structural elements of the MERC include the WtE foundations, framing and façade housing the waste bunker process plant and equipment, an administration building, a visitor and education centre, a substation and transformer area, utilities connections, drainage, internal roads and hard stand, as well as an IBA processing facility and APCr stabilisation facility with associated buildings. The proposed visitor and education centre will help educate and inform the community about the circular economy, recycling, resource recovery, the benefits of landfill diversion and WtE. The intent behind this education is to drive a shift in community thinking and actions around waste management.

The MERC will thermally treat 380,000tpa of residual waste based on an average annual lower heating value (LHV) of 11.2MJ/kg for feedstock primarily consisting of residual MSW and residual commercial waste streams. The waste will be delivered by truck to a sealed, watertight concrete waste bunker. The bunker will have enough capacity to store approximately 21,000m^3 of feedstock onsite, corresponding to approximately seven days supply at operating capacity. Two grab cranes will operate together to mix the waste within the waste bunker and feed waste into the boiler feed chutes.

Moving grate combustion technology has been chosen as the method to thermally treat incoming waste to recover energy. This is a common form of WtE technology where the waste is passed through the combustion chamber by a moving grate to enable the complete combustion and energy recovery from the combustible components in the waste material. The waste is processed in the presence of sufficient combustion air to ensure complete combustion, in two parallel moving grate-boiler lines. Each integrated grate-boiler line will have a nominal capacity of 190,000tpa (at a lower heating value (LHV) or 11.2 MJ/kg). The Proposal is also proposing to use tried-and-tested best available techniques including semi-dry flue gas treatment technology in combination with a fabric filter baghouse, to treat the flue gas, capture boiler fly ash and flue gas treatment reagents and reaction products and meet stringent international best-practice emission standards.

Waste feedstock will be transported to the facility via:

- Council compactor truck ~15% (by weight of feedstock)
- Front-load type compactor truck ~17%
- Cleanaway transfer station or third-party transfer station (A-Double) trailer trucks ~68%.

Two site access points are proposed along Summerhill Road. Whilst the facility will operate 24 hours per day, access to the site by waste haulage, consumable carrying and product /by-product dispatch vehicles shall typically be limited to the hours of 6am to 6pm, 6 days per week (with typically no access on Sundays).

Access points proposed are:

- Visitor and education centre access is approximately in the centre of the southern site boundary
- All other access (including trucks delivering waste and for operation and maintenance staff) is from the south-east corner of the site.

Vehicle movements are estimated at 150 vehicles per day (150 entry movements and 150 exit movements) of which approximately 100 will be truck movements and approximately 50 will be passenger vehicle movements.

Potable water mains will provide clean water supply to the MERC. The Proposal is also considering the feasibility of a separate recycled water connection, to reduce the reliance on the

potable (drinking) water system for some process water and some firewater consumers. Water handled onsite, including process water from the WtE process, will be reused onsite. The MERC is being designed to have zero process wastewater discharge during normal operation.

The MERC will include the following firewater system and firefighting equipment:

- Water cannons and thermal detection system within the waste bunker area
- Water sprinklers within offices and staffed building areas
- Fire hydrant network.

A comprehensive process control and monitoring system which supports the automated operation of the facility will be installed.

Electricity reticulation infrastructure, including underground high-voltage cables for distribution, switching equipment and low-voltage infrastructure will be installed. An emergency diesel generator will also be installed for use in the event of a major power failure.

To allow generated electricity to be exported to the electricity grid and to allow electricity to be supplied by the electricity grid when the facility is not operating (for example, during a full facility start-up or shut down for maintenance), a substation (to be owned and operated by the local Distributed Network Service Provider, Jemena) will be constructed on site complete with a new connection to the electricity grid. The facility will be capable of 'Island Power Mode' operation where, in the event of a disruption to the electricity grid, the facility will be able to continue to process waste and provide its own electricity needs, independent of the electricity grid. This means that the MERC will be able to continue to receive and process waste and fulfill its obligations to waste suppliers in the event of a failure of the electricity grid.

The Proposal has also considered the role of emerging technology to improve environmental performance over time, as these technologies become technically and commercially available. In line with local EPA guidance, the Proposal has been designed to meet the European Industrial Emissions Directive (IED) and the associated *Best Available Techniques Reference (BREF) Document for Waste Incineration* (BREF, 2019) which establishes best practice and environmental standards for waste incineration in the European Union.

The BREF (2019) sets emission limits for a number of emission parameters, some of which are more stringent than the legacy versions of the BREF, responding to continuous improvements to emission control technology and practices (Best Available Techniques (BAT)). The IED requires that environmental permit conditions should be set on the basis of BAT, through a formal assessment process resulting in the preparation of BAT reference documents (e.g., BREF) which are to be reviewed every eight years. By implication, compliance with the emission limit values will result in actual measured emissions below those emission limit values.

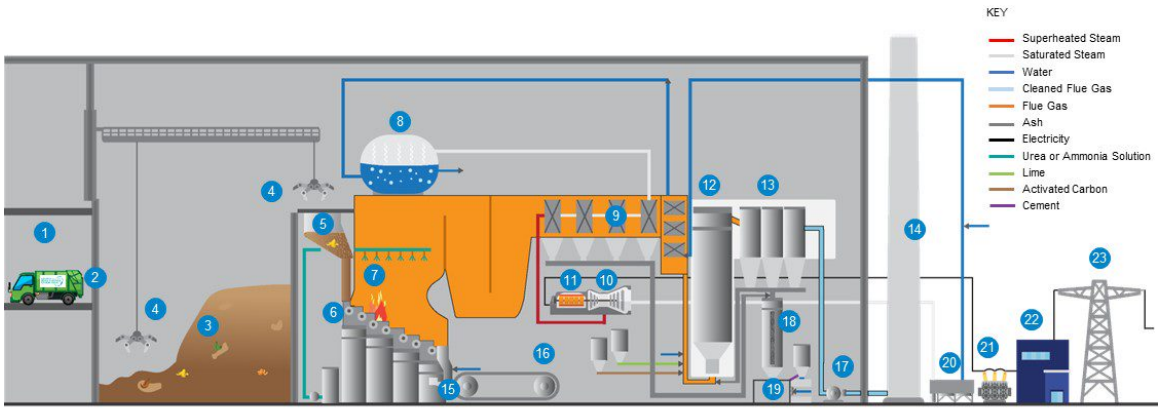
The BREF (2019) provides 37 BAT conclusions based on the IED and information shared between EU member states. The EU issued an Implementing Decision (Commission Implementing Decision 2019/2010) of 12 November 2019 establishing the BAT conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration, referred to as the BATC, 2019. The BATC, 2019, contains a summary of the key BAT conclusions.

The BREF (2019) provides a variety of concepts that constitute BAT. Not all techniques are appropriate in all situations and not all techniques can be used together. Techniques are chosen that best suit the WtE technology being utilized and local conditions (e.g., waste composition and local environmental setting). The BREF (2019) limits are considered more stringent than existing Victorian requirements. MERC has been designed such that it is compliant with the definition of BAT used by the European Union and set out in the BREF (2019). At a minimum, the Proposal will meet the limits set out in the IED and associated BREF (2019). Compliance with the newly published BREF (2019) is world's best practice regarding environmental performance of WtE facilities, therefore the facility meets the requirements of the Victorian WtE policy and guidelines with respect to design aligned to international best practice.

To allow the facility to accommodate more stringent standards in the future, the Proposal will spatially provision for the potential retrofit of additional flue gas treatment equipment and for the potential retrofit of a carbon capture facility. The distributed control system and continuous

emissions monitoring systems design will allow the flue gas treatment process to respond to variations in the flue gas to maintain stack emissions within regulated emission limits.

Refer to Figure 4 for the waste-to-energy process overview and Figure 5 / Attachment 2 for the MERC site plan.



LEGEND

1	Waste receiving hall	7	Boiler with SNCR (de-NOx)	13	Bag filter	19	Treated APCr to stabilization area for curing prior to removal off-site for disposal
2	Tipping bay	8	Steam drum	14	Stack		
3	Waste bunker	9	Heat exchangers	15	Incinerator bottom ash (IBA) quenching	20	Air cooled condenser
4	Waste crane	10	Steam turbine	16	IBA conveyor to treatment area for maturation and on-site metals recovery	21	Transformer
5	Feed hopper (chute)	11	Generator			22	Substation
6	Moving grate	12	Semi dry reactor	17	ID Fan	23	Local electricity grid or 'behind the meter' connection points
				18	Air Pollution Control residues (APCr) and boiler fly ash silo		

Figure 4: Waste-to-energy process and key components

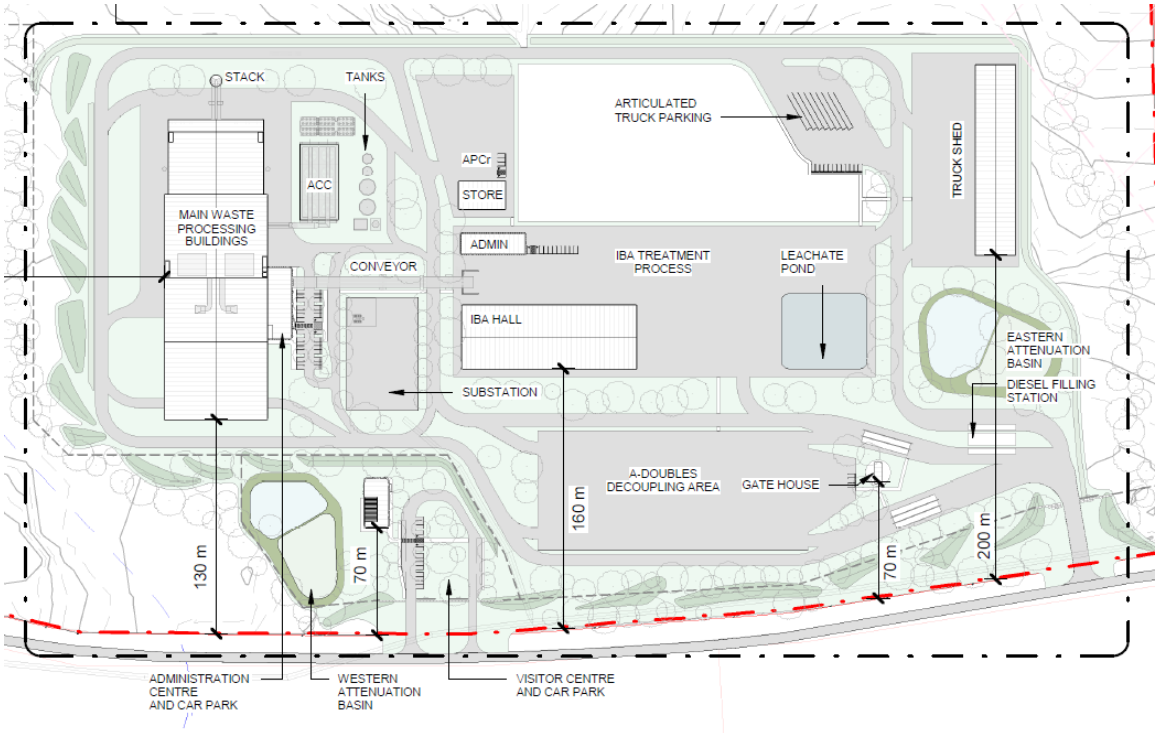


Figure 5: The MERC site layout (refer to Attachment 2 for full extent)

Ancillary components of the project (e.g. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

Ancillary components for the MERC are excluded from this referral application (refer to Section 5).

Key construction activities:

The construction of the MERC is expected to take approximately three to four years, including hot and cold commissioning, finishing and landscaping works. Significant site works will be required to facilitate the construction and operation of the MERC, including bulk earthworks, excavation, construction of roadways, hardstands, buildings, and ancillary structures. The main phases of construction comprise:

- Phase 1: Demolition (to remove existing residential building onsite and an old septic tank)
- Phase 2: Site establishment and enabling works:
  - Environmental protection works
  - Site establishment, including management plans, construction of site compounds, hardstand and laydown areas, temporary internal and external roads and car parks
  - Permanent site security fencing
  - Bulk earthworks across the site
  - Services location and reticulation
  - Stormwater management
  - Piling and foundations.
- Phase 3: Main construction works
  - Structures works (concrete and structural steel)
  - Process halls, process plant delivery, installation, testing and commissioning
  - Fuel and water storage and reticulation
  - Materials handling (conveyors)
  - Stack
  - Finishes, including facades, roofing and internal finishes
  - Ancillary services, including mechanical, electrical, external substation and in-ground services
  - Visitor and education centre
  - Internal operational roads and car parks.
- Phase 4: Testing and commissioning works
  - Commissioning and testing of individual equipment and facility as a whole
  - Commissioning and testing of systems, including the Continuous Emissions Monitoring System (CEMS)
  - Input/output testing
  - Noise testing
  - Full proof of performance trials
    - Testing performance of emission control systems
    - Testing performance of odour control systems (primary and secondary)
    - Residue (IBA / APCr) composition testing
    - Demonstrating compliance with environmental criteria in licenses
- Phase 5: Finishing and landscaping works.

Construction of the Proposal is estimated to create approximately 800 direct construction jobs over the three year construction period, and in addition between 100-150 indirect construction jobs.

Key operational activities:

The MERC will thermally treat both residual MSW and residual C&I waste, that meets the requirements of the Waste Acceptance Protocol. The waste feedstock received at the facility will include residual MSW waste (subject to source separation of recyclable and organic material), residual C&I waste and any other wastes that are classified as ‘permitted waste’ under the *Victorian Waste to Energy Framework* (2021). Source separation involves the waste generator (e.g., a household, a business or a consumer, patron or customer at an institution, shopping centre, train station, park etc) separating waste into common material streams or categories for separate collection.

The Proposal will use established and proven WtE techniques and technology. Key operational activities include:

- **Waste feedstock** supply will be managed contractually via pre-approval / auditing processes to ensure the composition and/or waste management process aligns with the MERC Waste Acceptance Protocol, avoiding any reportable priority waste. In addition, secondary controls will include on-site monitoring of waste delivery details (weight, vehicle details, waste type and supplier details etc.), on-site random inspection of waste deliveries prior to being deposited in the waste bunker and visual inspection (via crane operator / CCTV) of waste deliveries into the waste bunker facilitate rejection of unacceptable or oversize wastes, where discovered
- Waste is tipped into an enclosed, **sealed concrete bunker** and mixed using cranes to homogenise the feedstock. Oversize, but otherwise acceptable waste, may be processed by a shredder prior to incineration
- Waste is incinerated using air-cooled **moving grate combustion technology**, the most proven and effective technology for recovering energy from mixed waste streams. Selective Non-Catalytic Reduction (SNCR) technology using either urea solution or ammonia solution, which is sprayed into the combustion chamber within a specific flue gas temperature range, is used to control NOx emissions. Heat from the flue gases is used to produce high-quality steam, in turn used to operate a turbine and generate electricity
- After energy recovery, the cooled flue gas proceeds to a **Flue Gas Treatment** (FGT) system, where lime and activated carbon are injected and mixed with the flue gas upstream of a baghouse filter. An induced draft fan draws the flue gas through the entire process and pushes the cleaned flue gas up a flue gas stack. A Continuous Emission Monitoring System (CEMS) continuously monitors the concentration of a range of potential pollutants in the cleaned flue gas associated with each grate-boiler line, enabling continuous adjustment to each combustion system and the addition of SNCR and FGT reagents. Primary combustion air is drawn from the tipping hall and waste bunker area, thus ensuring an inflow of air into the tipping hall and waste bunker areas and thermal destruction of any odorous substances within the combustion process
- **Process residues** are as follows:
    - **Incinerator Bottom Ash** (IBA): collected at the bottom of the grate, conveyed to an on-site maturation, processing and metals recovery facility to produce an aggregate product suitable for civil construction applications (IBA Aggregate / IBAA). Cleanaway, like other WtE developers throughout Australia, will investigate re-use pathways for the IBAA product, such as road aggregate. As a contingency, or in the event of a market failure of the IBAA product, the IBAA will be disposed of to a lawful facility
    - **Air Pollution Control residue** (APCr): consisting of boiler ash, fly ash, spent FGT reagents and reaction products, is collected in silos at the rear of the facility; mixed with cement and water to form a slurry then transported to an on-site stabilisation area. Likely to be Category B reportable priority waste after stabilisation; to be disposed of to a lawful facility.

Operation of the Proposal is estimated to create approximately 35-50 full-time equivalent employment roles and additional contractor roles at peak operations.

Key decommissioning activities (if applicable):

The MERC is designed to be operational for 30 years. The plant will likely be upgraded in order to extend the life and operations of the facility beyond 30 years.

A Decommissioning Plan will be prepared once the facility is operational and Cleanaway understands the likely form for decommissioning.

Is the project an element or stage in a larger project?

☒ No ☐ Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

The Proposal outlined in this referral is currently not part of a larger stage of works for the WtE facility.

The Proposal will consider the role of emerging technology to advance the process and/or environmental performance over time and as these become technically and commercially available. As such the design has been developed with spatial provision for the potential retrofit of additional flue gas treatment equipment and for the potential retrofit of a carbon capture facility. The Proposal will be designed to comply with industry BAT, as defined in the BREF, which is subject to periodic review. The design also includes spatial provisioning for future expansion to a third line, if deemed appropriate.

Is the project related to any other past, current or mooted proposals in the region?

☒ No ☐ Yes If yes, please identify related proposals.

What is the estimated capital expenditure for development of the project?

The Proposal has an estimated capital expenditure value of approximately $700 million.

4. Project alternatives

Brief description of key alternatives considered to date (eg. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

Site location

Cleanaway considered approximately 200 sites across wider Melbourne and Victoria. Refer to Section 3 for an overview of the site selection process.

The proposed location for the MERC was chosen due to the current land zoning of the site and surrounds, proximity to grid connection (and capacity of the network at this location), access roads and separation distances from sensitive receptors. The surrounding existing industrial land uses was a key deciding factor for the location of MERC. Refer to Section 3 for further details on existing land uses.

The nearest existing residential areas are Craigieburn (approximately 3km to the west), Epping (approximately 2km to the south), and Mernda (approximately 8km to the east) (refer to Section 7 for further detail).

There are several Precinct Structure Plans (PSPs) surrounding the Proposal. The closest residential PSPs to the Proposal will be Shenstone Park PSP (1.3km north) and Wollert PSP (1.8km south-east).

Thermal treatment technology

Moving grate combustion was chosen as the preferred thermal treatment technology.

There are a variety of different thermal treatment technologies that exist for WtE facilities globally. For the MERC, the following WtE technologies were considered:

1. Moving grate combustion
2. Fluidized bed combustion
3. Gasification & Pyrolysis
4. Two-stage combustion i.e. a gasification or pyrolysis stage followed by a combustion stage, to immediately combust the intermediate syngas product

A robust assessment process was undertaken to screen the various WtE technologies to determine the most appropriate technology for the MERC. The following criteria was applied:

- Commercial operation: availability of reference facilities of a similar size and waste type in commercial operation for more than one year
- Waste treatment cost: to establish whether technology is competitive with regard to treatment cost, disposal cost, energy revenue, operational availability and maintainability
- Environmental performance: ability to fulfil the conditions set out in the Victorian Waste to Energy Framework and EPA guideline *1559.1*.

Gasification & pyrolysis and two-stage combustion technologies were not considered appropriate for the MERC for the following reasons:

- Limited evidence of commercial viability or application outside Japan
- Poor historical performance outside Japan
- Less mature technology than moving grate or fluidised bed for mixed wastes
- Not suitable for non-homogeneous waste streams that have not been pre-treated
- Unreliable when treating varying waste compositions
- Less reliable technical performance based on historical use.

A more detailed analysis of the moving grate and fluidised bed combustion was undertaken, with the following findings:

- Of the approximately 500 operational thermal treatment facilities across Europe[3], the majority use the moving grate-type combustion technology for mixed, non-hazardous wastes such as MSW and C&I waste
- Although fluidised bed combustion can be designed for a wider array of fuels from an energy content (calorific value) perspective (6MJ/kg to 40MJ/kg compared to 6MJ/kg to

[3] https://www.cewep.eu/waste-to-energy-plants-in-europe-in-2019/

15MJ/kg for moving grate), the fluidised bed combustion process requires a more homogenous waste stream requiring pre-treatment in the form of shredding to a smaller particle size than moving grate technology requires. This makes fluidised bed technology less suitable for the heterogeneous nature of residual MSW and C&I waste. The calorific value operating range for moving grate systems is considered sufficient to deal with the feedstocks of residual MSW and C&I waste streams expected to be processed by the MERC. Fluidised bed combustion is less able to handle variation in feedstock calorific value

- Fluidised bed technology uses hot sand as a fluidising medium. This degrades over time and must be replaced generating a solid waste stream which would have to be disposed of to landfill.
- Operational availability of a fluidised bed facility is lower than a moving grate facility (7,500 hours vs 8,000 hours per annum). Moving grate technology allows for increased efficiency and capacity.

Moving grate technology was selected as the preferred technology for the MERC given that it is the most established and proven technology used globally (for over 100 years) with numerous operational examples (of similar size and capacity) and several operational advantages compared to fluidised bed technology. In addition, a facility of a similar scale and also processing MSW using moving grate technology, is being developed at Maryvale in Victoria and has already received a Works Approval (now known as a Development Licence) from the EPA.

FGT technology
A semi-dry solution was chosen as the preferred FGT technology for the MERC.

There are two main FGT technologies available on the market; a dry system and a wet system, although numerous variations and combinations of the two main concepts exist. Between these two options sits the semi-dry with post scrubber option.

- Dry system treatment residues leave the facility as a dry product, such that no wastewater stream is produced. The dry concept comprises baghouse filtration to collect the solid residue from the FGT system. Often, dry systems are considered semi-dry due to the injection of water within the treatment consumables and/or upstream of the acid-gas scrubber reactor system; injected water is fully evaporated upstream of the baghouse
- The wet system is characterised by the use of one or more wet scrubbing steps, where the majority of pollutants are captured within a wastewater stream. This wastewater required further treatment followed by disposal.

It is worth noting that each of these systems can achieve emission limit values within the BAT-AEL range specified in the BATC 2019, and that each of the technologies are considered to be BAT within the BREF 2019. Therefore, each of the technologies represent international best practice.

Each treatment system type was analysed against a variety of criteria, and global facility examples, to determine the technology most suitable for the MERC. After consideration of the different FGT technologies for the MERC, the base semi-dry system was chosen:

- The wet system was discounted because it creates a significant amount of process wastewater and uses additional water. There is no viable point of discharge for industrial wastewater near the Proposal area, so a wet system was deemed unsuitable
- Higher overall process efficiency achieved via lower energy demand of semi-dry system
- Air quality modelling (Katestone, 2023) in line with achievable limits for the base semi-dry technology has shown that, in isolation, the impact of the MERC on the surrounding air quality will be insignificant and predicted air quality will meet all relevant Victorian air pollution assessment criteria
- The semi-dry system with a polishing scrubber was discounted due to:
    - Emission concentration limits relevant to the MERC (BATC upper) can be achieved with the base-semi dry system alone
    - Introduction of larger quantities of hazardous reagents such as caustic soda
    - Additional cost and complexity associated with installation (resulting in higher gate fees for Councils and other waste suppliers)
    - Additional electricity requirements, reducing efficiency

• Potential visual impact from plume due to higher humidity in the cleaned flue gas. The semi-dry solution was therefore selected for the MERC.
Brief description of key alternatives to be further investigated (if known)**:** No further investigation of alternatives (Proposal location or technology) will be undertaken. The Proposal site has been acquired by Cleanaway.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

Several additional projects, referred to as related development, are required to support the operation of the MERC, however these are excluded from this assessment. These include:

- An electrical connection to the high-voltage network
- Potable (and potentially recycled) water connections
- A potential natural gas connection
- Telecommunications connections
- Site access works (including potential road and bridge upgrades along Summerhill Road).

6. Project implementation

Implementing organisation (ultimately responsible for project, i.e. not contractor)**:**
Cleanaway Operations Pty Ltd

The overall construction timeframe is expected to be three years following planning and environmental approval. It will be built and managed in five phases by a contractor. Constructing in phases will allow for effective site and environmental management. The main phases of construction comprise:

- Phase 1: Demolition
- Phase 2: Site establishment and enabling works
- Phase 3: Main construction works
- Phase 4: Testing and commissioning works
- Phase 5: Finishing and landscaping works.

Refer to Section 3 for further detail.

Operation of the Proposal will take place once construction (along with testing and commissioning) is complete. The proposed staging for the operational phase of the Proposal is as follows:

- Phase 1 (one-two years): Cleanaway to engage the EPC contractor and technology provider to train Cleanaway operations and maintenance staff in the operation and maintenance of the facility
- Phase 2 (two years onwards): Full handover of operation to Cleanaway. Cleanaway will engage specialist technical advisors and will recruit specialist staff for the operations and maintenance phase.

Proposed staging (if applicable):
N/A

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

☐ No ☒ Yes If no, please describe area for investigation.

If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

The proposed location for MERC is at 510 Summerhill Road, Wollert (VIC) (Lot 10B PP2819) (refer to Attachment 3 and Attachment 4).

Based on a review of topographical maps, the highest elevation of the Proposal area is at 224m AHD (Australian Height Datum) at the north-eastern corner. The Proposal area slopes downwards from this point in a south-westerly direction towards the middle of the Proposal area, and then slopes downwards in a south to south-westerly direction to the lowest elevation at 208m AHD in the south-eastern corner.

The soil profile of the Proposal area generally comprises very stiff and hard, high plasticity, silty clays between 0.2m and 2.9m thick over basalt rock, with basalt rock intrusions into the clay commonly occurring. There is an area in the south-east of the Proposal area containing up to 2.3m of imported fill, and further areas around the existing buildings containing between 0.2m and 0.7m of fill (predominantly reworked natural soil). Although the depth to basalt is variable across the Proposal area, depth typically increases on a north to south gradient.

The Proposal area is located within the Yarra River basin and Merri Creek Catchment. Curly Sedge Creek and associated tributaries interact with the Proposal area before draining into the Merri Creek further south. The Proposal area drains from north to south.

The Proposal area comprises predominantly open pasture grassland consisting of both native and invasive species. There are scattered shrubs and several trees largely clustered around the buildings in the centre of the Proposal area. Suitable habitat is present for Eastern Grey Kangaroos, Growling Grass Frogs, Matted Flax Lily and Golden Sun Moth however targeted surveys have confirmed that these species are not present within the Proposal area. The Proposal area is also located within a Bushfire Prone Area.

The Traditional Owners for the site are the Wurundjeri People who are represented by the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation.

Site area (if known): approximately 82 hectares

Route length (for linear infrastructure) N/A

Current land use and development:

The Proposal area has been purchased by Cleanaway and is currently being overseen by a caretaker, including the residential property that is located within the centre of the site. Livestock are currently grazing on-site. Previous land uses for the site are residential and agricultural, with one residential building and associated outbuildings and agricultural features such as troughs, dams and livestock fencing present. There is a high voltage transmission line that traverses north-west to south-east and intersects with the northern portion of the Proposal area.

There is also a high voltage transmission line that traverses north-west to south-east and intersects the northern portion of the Proposal area.

Description of local setting (eg. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):

The site covers approximately 82ha and is bound by Summerhill Road to the south (unsealed), and open pastureland to the north, east and west. The nearest residential areas are Craigieburn (approximately 3km to the west), Epping (approximately 2km to the south), and Mernda (approximately 8km to the east). Nearby residential properties include 620 Summerhill Road (approximately 400m from the north-western corner of the site), 570 Summerhill Road and 585 Summerhill Road (approximately 350m and 430m from the south-western corner) and 475 Summerhill Road and 430 Summerhill Road (located 100m and 350m respectively from the south-eastern corner). There is a high voltage transmission line that traverses north-west to south-east and intersects the northern portion of the site. A 100m wide electricity easement runs parallel to the transmission line.

The nearest sensitive receptors, including numerous schools, are located within Craigieburn, Wollert, Mernda, Donnybrook and Kalkallo. Located approximately 4km south of the site are three key receptors: Edgars Creek Primary School, Edgars Creek Secondary College and Ganby Gulinj Community Centre. Located 4km south-west of the site is Craigieburn Primary School, and 4km west is Mother Teresa Catholic Primary School.

The Barro Group Mountain View Concrete Quarry (known as Woody Hill Quarry) is located approximately 1km north-west of the site. This site extracts, processes and distributes raw materials, including crushed rock, coarse and fine sands and gravels. Austral Bricks Wollert clay quarry ('Brickworks') is located approximately 500m to the south-west of the site (585 Summerhill Road). A Compression Station (owned by APA Gasnet) is located 1km west of the site. Hanson cement quarry and landfill site, as well as Wollert Waste Management, is located approximately 5km east of the site. In addition, at 430 Summerhill Road, a rectangular rural site has approval for future use as a new quarry (Phillips Quarry). Quarries are currently required to have a 500m amenity/sensitive land use buffer, and a 200m blast buffer. These buffers both pass through the proposed site. However, as no sensitive land use is planned for the site, this is unlikely to have any implications.

The Hume Freeway (M31) is located 2.8km west and 2.9km south of the site. Key transport routes to the proposed site would likely be along C722 and C729 from Wollert.

Craigieburn Grassland Nature Conservation Reserve is located 3.2km south of the site. The Merri Creek is located approximately 800m from the western boundary of the site and runs roughly parallel to this boundary. Curly Sedge Creek is located adjacent to the eastern boundary. An ephemeral tributary of Curly Sedge Creek is located along the western boundary and is present on-site in the south-west, northern and north-west corner of the site. The eastern edge of the site is covered by an area of Aboriginal Cultural Heritage Sensitivity, and this area includes a 200m buffer around a waterway on adjoining land.

Refer to Attachment 1.

Planning context (eg. Strategic planning, zoning & overlays, management plans):
A planning permit is currently being prepared for the site to allow for a waste-to-energy facility to be developed.

<u>Planning zones</u>
The majority of the Proposal area is located within the Farming Zone (FZ). Pursuant to Clause 35.07-1 (Section 2), a permit is required for the use of land for a waste-to-energy facility and pursuant to Clause 35.07-4, a permit is required for buildings and works associated with a use identified in Clause 35.07-1 (Section 2).

A small portion of the land to the north-eastern corner of the Proposal area is located within the Rural Conservation Zone – Schedule 1 (RCZ1). It is noted that the proposed use will not utilise the portion of land located within the RCZ1 (refer to Attachment 5).

Land zonings around the Proposal area include the Special Use Zone 4 (SUZ4) located east and south-east of the Proposal area.

Planning overlays
A small portion of the land to the north-eastern corner of the site is located within the Environmental Significance Overlay – Schedule 4 (ESO4) (refer to Attachment 6). No buildings and works are proposed within the extent of the ESO4 affected area.

Other
The land is located within a designated Bushfire Prone Area (BPA). Development on the site must be able to achieve a Bushfire Attack Level of 12.5 and provide the required commensurate separation distance from vegetation.

A small portion of the site is also located within an area of Aboriginal cultural heritage sensitivity, located along the eastern edge of the Proposal area, associated with Curly Sedge Creek.

The Proposal is also located within the Melbourne Strategic Assessment (MSA) area and the Northern Growth Corridor of Melbourne's Biodiversity Conservation Strategy (BCS).

Local government area(s): The site is within the City of Whittlesea local government area (LGA).

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity
(cf. general description of project site/study area under section 7)**:**

Ecology

The Proposal area comprises predominantly open pasture grassland consisting of both native and invasive species. There are scattered shrubs and several trees largely clustered around the buildings in the centre of the Proposal area.

Suitable habitat is present for Eastern Grey Kangaroos, Growling Grass Frogs, Matted Flax-Lilies and Golden Sun Moths. The Proposal area is located within a Bushfire Prone Area. Refer to Attachment 11.

Soils

The soil profile of the Proposal area generally comprises very stiff and hard, high plasticity, silty clays between 0.2m and 2.9m thick over basalt rock, with basalt rock intrusions into the clay commonly occurring. There is an area in the south-east of the Proposal area containing up to 2.3m of imported fill, and further areas around the existing buildings containing between 0.2m and 0.7m of fill (predominantly reworked natural soil). Refer to Attachment 15.

Groundwater

Groundwater is present at depths of between 0.32m and 4.23m below current site surface levels (203.7 – 214.8m AHD) and is interpreted to be flowing towards the south-east. Refer to Attachment 15.

Aboriginal cultural heritage

The Traditional Owners for the Proposal area are the Wurundjeri People who are represented by the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation. An area of potential Aboriginal Cultural Heritage Sensitivity is located along the eastern edge of the Proposal area, associated with Curly Sedge Creek. Refer to Attachment 6.

Waterways

The Proposal area is adjacent to two small waterways:

- Curly Sedge Creek, located along the outside edge of the eastern boundary
- A tributary of Curly Sedge Creek (waterway known as Tributary 4545), located adjacent to the western boundary of the Proposal.

The waterway mapped as Tributary 4545 has been characterised as a very poorly defined, discontinuous channel (Hydrology & Flooding assessment (Arup, 2023)).

Due to the existing topography of the site, there are two primary stormwater catchment areas (to the east and west) which flow south beyond Summerhill Road and ultimately to Merri Creek. Two small culverts are present beneath Summerhill Road which conveys flows from both Curly Sedge Creek and Tributary 4545. The two cross drains running below Summerhill Road are estimated to be DN 225 / DN 300 in size.

The existing site consists mainly of open farmland and does not contain any existing water quality infrastructure. There is also no formal stormwater road drainage serving Summerhill Road to the south, which comprises an unbound gravel surface.

Refer to Attachment 16.

9. Land availability and control

Is the proposal on, or partly on, Crown land? ☒ No ☐ Yes If yes, please provide details. The site is owned by Cleanaway and is not on Crown Land. However, the site is formally identified as Crown Allotment 10B on Title Plan 362971C.
Current land tenure (provide plan, if practicable): N/A
Intended land tenure (tenure over or access to project land): N/A
Other interests in affected land (eg. Easements, native title claims): The Plan of Subdivision indicates that an electricity easement of approximately 110m width runs diagonally across the land. The title confirms that the Crown grants the right to use land for extraction of resources subject to conditions and obligations.

10. Required approvals

State and Commonwealth approvals required for project components (if known):

The MERC requires approval under the *Environment Protection Act 2017* (EP Act) and *Planning and Environment Act 1987* (PE Act).

Under the EP Act a Development License is required. A Development License Application (DLA) is currently being prepared with submission of the DLA to the Environment Protection Authority (EPA) targeted for April 2023. As part of the DLA, a number of technical assessments are being prepared to inform an understanding of the risk to human health and the environment from the facility.

Under the PE Act a Planning Permit is required. A Planning Permit Application (PPA) is currently being prepared with submission of the application to the Minister for Planning targeted for March 2023. Similar to the DLA, as part of the Planning Permit, a number of technical assessments are being prepared to inform the application.

The full suite of technical assessments being prepared for the DLA and PPA will be exhibited to the public.

A summary of State regulatory requirements is outlined in Table 1.

Table 1: State regulatory requirements

Legislation	Authority	Approval / Permit / Licence	Requirement / Applicability
Aboriginal Heritage Act 2006	Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation	CHMP (Complex Assessment)	Preparation of a CHMP is underway. Submission to the Registered Aboriginal Party (RAP) is programmed for mid-2023.
Environment Protection Act 2017	EPA	DLA	The Proposal meets the Prescribed Activity definition for A08: Waste to Energy which triggers the requirement for an approved DLA and Operational Licence. The DLA will be submitted to the EPA in early 2023. Public exhibition of the DLA will occur concurrently with the Planning Permit.
Circular Economy (Waste Reduction and Recycling) Act 2021, environment Legislation Amendment (Circular Economy and Other Matters) Act 2022, Victoria Waste to Energy Framework, 2021	Recycling Victoria	Cap Licence allocation	A Cap Licence is required to allow Cleanaway to recover energy from permitted waste. It is prohibited for a WtE operator to operate a thermal WtE facility without an approved Cap Licence, or to operate a facility in a manner that is not in accordance with its Cap Licence. Cleanaway will be applying for a Cap Licence under Section 74S of the Act. Submissions for the Cap License application are not yet open but are anticipated to open mid-2023.

Planning and Environment Act 1987	Minister for Planning	Planning Permit	A Planning Permit application is being prepared and will be submitted to the Department of Transport and Planning in early 2023. Public exhibition of the Planning Permit application will occur concurrently with the DLA.
Heavy Vehicle National Law Application Act 2013	Whittlesea Council / Hume Council / Department of Transport	Road Access Permit	A Road Access Permit will be required for operation of the facility.

Have any applications for approval been lodged?

☒ No ☒ Yes If yes, please provide details.

No application has been lodged to date.

Approval agency consultation (agencies with whom the proposal has been discussed):

The following key stakeholders have been consulted with on the Proposal:

- Department of Transport and Planning (Impact Assessment Unit, Planning Assessment, State Project Concierge) – formerly Department of Environment, Land, Water and Planning (DELWP)
- Whittlesea City Council
- Hume City Council
- Environment Protection Authority (EPA)
- Recycling Victoria
- Wurundjeri Woi-Wurrung Cultural Heritage Aboriginal Corporation.

Other agencies consulted:

- Department of Jobs, Skills, Industry and Regions (formerly Department of Jobs, Precincts and Regions)
- Victorian Planning Authority.

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

A high-level environmental risk assessment is being developed for the MERC to identify the key risks to the environment associated with the Proposal. The key risks identified relate to air quality, greenhouse gas, noise and vibration, human health and management of by-products. These risks are being addressed with under the EP Act and the DLA, with a range of mitigation and management measures included within the design to reduce the risks of harm to human health and the environment.

The environmental risks have been identified and assessed through a method consistent with *International Standard ISO 31000:2009, Risk management - Principles and guidelines* (Standards Australia, 2009) and *Standards Australia's Handbook HB203:2006 – Environmental Risk Management, Principles and Process* (Standards Australia, 2006).

Air Quality

The potential impacts associated with the operation of the Proposal have been assessed using dispersion modelling, which is consistent with a Level 2 assessment approach as outlined in EPA Victoria's Publication 1961. The dispersion model AERMOD was used to predict ground-level concentrations of key pollutants due to the Proposal, across the model domain and at key sensitive receptors. Emission rates of air pollutants are based on the upper end of the range of BAT-AEL emission concentrations defined in the BREF (2019).

A cumulative assessment was also conducted incorporating the adjacent Austral Bricks owned Brickworks and surrounding existing industrial activities (identified within a 5km radius of the Proposal). These have been identified as cumulative emission sources as they emit key pollutants also associated with the Proposal. The industrial activities include clay brick manufacturing, gas transmission and hard rock quarrying.

The assessment of air quality addresses both the Proposal's effect in isolation, as well as cumulatively with surrounding existing industrial activities, in relation to dust soiling, human health at sensitive receptors, ecological receptors and plume visibility. For construction associated impacts, receptors within 350m of the Proposal were considered, with one sensitive receptor identified within 110m of the Proposal. For the operational impact assessment sensitive receptors within approximately 10km of the Proposal were considered, with 40 sensitive receptors identified.

For the Proposal's construction phase, the Air Quality assessment identified:

- Without mitigation, the initial risk of dust soiling associated with the construction of the Proposal is low to medium
- Without mitigation, the initial risk to human health associated with construction of the Proposal is low
- Without mitigation, the initial risk to ecological receptors associated with the construction of the Proposal is low to medium.

For the Proposal's operational phase, the assessment identified:

- The Proposal (in isolation) is predicted to have an insignificant impact on air quality (no exceedance for any air pollutant), as measured against the relevant health-based and environmental based Air Pollution Assessment Criteria (APACs) (<15.5% of APACs for all pollutants, with the majority <2% of the APACs)
- Predicted cumulative ground-level concentrations of all air pollutants due to the Proposal comply with the relevant APACs across all sensitive receptors, with the exception of hydrogen fluoride, PM_{10} and $PM_{2.5}$ (refer to Section 19). The elevated PM_{10}, $PM_{2.5}$ and hydrogen fluoride ground level concentrations are a result of elevated background concentrations (from surrounding industry or off-site bushfire activity), and not from the WtE facility
- The modelling indicates that the visible plume is contained within the Proposal area.

Greenhouse Gas

A draft greenhouse gas (GHG) assessment has been prepared to quantify the greenhouse gas (GHG) emissions resulting from the construction and operation of the Proposal. The GHG assessment estimates that direct GHG emissions that are directly attributable to the operation of the Proposal will be approximately 193,000tCO2-e/y. This figure is close to the trigger for the EES referral criteria for GHG emissions.

This figure may be reduced to approximately 191,500tCO2-e/y through the use of biodiesel to replace diesel for the operation of stationary plant. Future changes to waste stream composition may result in a further reduction in direct GHG emissions, although this is highly uncertain.

Despite the direct GHG emissions figure, the Proposal also provides the potential to avoid indirect GHG emissions due to:

- The diversion of waste material from landfill which produce methane emissions during decomposition
- The production of electricity with a lower emissions intensity than many existing traditional sources of generation
- The recovery of recyclable materials, including ferrous and non-ferrous metals and bottom ash, after incineration to replace virgin materials in construction.

Therefore, the Proposal may result in a net reduction in GHG emissions during operation. However, there is significant uncertainty associated with the avoidance of GHG emissions due to anticipated changes in waste composition, increases in the efficiency of landfill gas capture, and a wider decarbonisation of the economy, including a reduction in emissions intensity of the Victorian electricity grid. Over the coming decades, these changes are expected to reduce (or even remove) the potential for the avoidance of GHG emissions from the MERC facility in the future. Irrespective of the future net GHG emissions in the longer-term, the MERC facility will still respect the waste hierarchy by recovering resources and energy from residual waste which would otherwise be destined for landfill disposal, thus preserving existing valuable landfill airspace and potentially avoiding the need to build new putrescible landfills in the future.

An indicative scenario modelled in the draft GHG assessment, based on a waste stream composition of 60:40% commercial and industrial waste to municipal solid waste, a 65% landfill gas capture efficiency, the current Victorian electricity emissions factor, and the current emissions intensity for virgin materials used in construction, estimates a net GHG emission reduction of -235,200tCO2-e/y.

Noise and Vibration

During construction there is a potential risk of exceeding construction noise management levels at residential receivers based on a range of conservative scenarios assessed for each construction phase. Construction scenarios will be planned and managed (via appropriate mitigation measures, including preparation of a Construction Noise and Vibration Management Plan (CNVP)) to minimise impacts to sensitive receptors. Practices to reduce construction noise impacts will include adherence to standard approved working hours, locating plant equipment as far away as possible from sensitive receivers, using site sheds / temporary structures to limit noise exposure and use of low-noise construction equipment (where feasible). Consultation with the community and surrounding stakeholders will be undertaken to reduce disruption / impacts where possible.

The distance between the expected construction site boundary and the nearest residential building are greater than the typical minimum safe working distances of expected vibration generating sources. Based on this assessment, vibration issues to building structures and human comfort are unlikely to be an issue.

During operation, there are no expected exceedances of the Noise Protocol ‘day-time’ or ‘night-time’ limits for surrounding residential receptors, with the exception of one sensitive receiver (475 Summerhill Road) located approximately 110m from the site boundary. Mitigation measures will be put in place to minimise risk, including construction of a noise barrier / earth bund, upgrading glazing treatment to affected residential receivers, ensuring unloading /loading takes place in enclosed spaces and including acoustically treated louvres on the south and east side of the main

WtE building. The assessment showed that there would be no exceedances of the Noise Protocol evening-time limits during operation.

Human Health

A high-level Human Health Risk Assessment (HHRA) is being prepared for the Proposal to evaluate the potential for the Proposal to cause impacts on human health for the off-site community, with consideration of existing and proposed land uses via air emissions, noise emissions, water issues or hazardous substances handling. This includes inhalation of criteria pollutants from combustion and specific air toxics, and multi-pathway exposure to persistent and bio accumulative chemicals via deposition to soil and water and uptake into produce (where relevant).

The assessment has identified:

- No unacceptable risks for criteria pollutants (NOx, SOx, CO, $PM_{2.5}$, PM_{10}) from the Proposal
- No unacceptable risks for short-term exposures from the proposed facility modelled for the closest off-site location (note, all other locations beyond this will have an even lower concentration exposure)
- No unacceptable risks for relevant exposure scenarios considering long-term exposures (both via inhalation and after deposition onto soil and uptake into home grown produce) at:
    - Closest off-site location
    - Closest residential location
    - Closest commercial / industrial location
    - Closest to other places location (including farms)
    - Closest on-site location
- No unacceptable risks for relevant exposure scenarios for rainwater tanks.

With consideration of the noise limits adopted and the assessment of noise impacts from the Proposal, where the Proposal is designed to meet the noise specifications identified (i.e. predicted levels), and the identified noise mitigation measures are implemented, there are no health issues of concern in relation to noise for the Proposal.

In summary, the assessment concluded that there are no health issues of concern in relation to air quality changes for the local community. The HHRA also identified that there are no health issues of concern in relation to water, noise, soil contamination, groundwater or dangerous goods / chemical hazards in relation to the Proposal.

Management of by-products and waste

The management of thermal treatment residue streams is a risk for the Proposal. The MERC's preferred approach is to establish recycling pathways where possible, whilst also identifying appropriate disposal options, so that environmental protection is maintained if recycling outlets are unavailable.

The main WtE residues and by-products are IBA and APCr:

- IBA is expected to be classified as industrial waste (until a suitable commercial reuse pathway is established) after maturation and sorting (to recover recyclable ferrous and non-ferrous metals) to produce an aggregate (IBAA) suitable for commercial reuse as a civil construction material. Classification, regulation, and reuse of IBAA is common practice in both the UK and Europe
- APCr (including fly ash) is expected to be Category A reportable priority waste before stabilisation, and Category B after stabilisation with cement and water, if an alternative proven treatment process is not available.

Adoption of the proposed treatment technology for the MERC (as outlined in Section 4) will result in a low risk to the environment from IBA or IBAA and APCr.

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

☐ NYD ☐ No ☒ Yes If yes, answer the following questions and attach details.

What investigation of native vegetation in the project area has been done? (briefly describe)

A due diligence ecology assessment was completed by Ecology and Heritage Partners (EHP, 2022) to identify the ecological values known to, or likely to occur within the Proposal area. The Proposal area is located within the Melbourne Strategic Assessment (MSA) area, and any development is subject to approval conditions in accordance with the Biodiversity Conservation Strategy (BCS) (DEPI 2013a).

What is the maximum area of native vegetation that may need to be cleared?

☐ NYD Estimated area ……1.746ha

The due diligence ecology assessment identified that the maximum removal of native vegetation for the Proposal will be 1.746ha.

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

☒ N/A …… approx. percent (if applicable)

N/A

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

☒ NYD ☐ Preliminary/detailed assessment completed. If assessed, please list.

Have potential vegetation offsets been identified as yet?

☐ NYD ☒ Yes If yes, please briefly describe.

Offsets of patches of native vegetation will be based on the extent of Time Stamping data. Clearance of native vegetation will likely invoke an offset fee of approximately $136,688 per hectare cleared.

Other information/comments? (eg. accuracy of information)

N/A

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done?
(provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

Targeted surveys have been undertaken for Growling Grass Frog (EPBC Act Conservation Status: Vulnerable), Matted Flax-Lily (EPBC Act Conservation Status: Endangered), and Golden Sun Moths (EPBC Act Conservation Status: Vulnerable). Results from the site investigations are:

- No Matted-Flax Lily was detected within the study area, despite targeted surveys being undertaken in optimal conditions and at a time with Matted Flax-Lily is known to be flowering. The history of disturbance at the site is likely to have resulted in degradation of existing Matted Flax-Lily habitat. Based on the available information a resident population does not exist within the Proposal area and the species will not be significantly impacted by the proposed development
- Targeted surveys for Growling Grass Frog were conducted throughout October – November 2022. Growling Grass Frog were confirmed calling at the reference sites on 9 and 28 November, however, were not detected within the study area or neighbouring Merri Creek during the surveys. The study area could potentially be used for dispersal activities, however targeted survey results indicate low likelihood of extant population occurring. Based on the available information it is considered unlikely that a significant impact will occur from the proposed development
- No Golden Sun Moths were detected within the study area, despite Golden Sun Months being recorded at the reference site. The history of disturbance through farming of

livestock at the site is likely to have resulted in degradation of existing Golden Sun Moth habitat, with the site supporting large open areas of non-native grasses and invasive weeds. Therefore, the likelihood of presence within the study area is considered low. Based on the available information a resident population does not exist within the Proposal area and the species will not be significantly impacted by the proposed development.

Have any threatened or migratory species or listed communities been recorded from the local area?

☐ NYD ☒ No ☐ Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

See above.

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (eg. loss or fragmentation of habitats) Please describe briefly.

The history of prior disturbance through farming of livestock at the site has resulted in degradation of existing habitats for threatened species and communities. The site now supports large open areas of non-native grasses and invasive weeds.

The proposed development will not further exacerbate existing impacts to the aforementioned species.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

☐ NYD ☒ No ☐ Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing) Comment on likelihood of effects and associated uncertainties, if practicable.

No - see above list of threatened species.

Is mitigation of potential effects on indigenous flora and fauna proposed?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

N/A

Other information/comments? (eg. accuracy of information)

13. Water environments

Will the project require significant volumes of fresh water (eg. > 1 Gl/yr)?

☐ NYD ☒ No ☐ Yes If yes, indicate approximate volume and likely source.

The Proposal will not require significant volumes of fresh water during construction or operation.

Potable water mains will provide clean water supply to the MERC. The facility has been designed to ensure there is a closed loop water system to ensure that:

1. All process wastewater will be captured, recirculated and reused in processes on-site
2. Rainwater capture will significantly reduce the demand for potable water.

Potable water mains will serve the firewater and process feedwater tanks external to the WtE building. A separate pressurised pipe network will connect the firewater and process feedwater tanks to the relevant systems within the WtE building and visitor and education centre. To supply the Proposal site with water, connections to offsite utilities and services are required, however these connections do not form part of this Proposal.

Water usage during construction will arise from:

- Construction staff (potable water)
- Construction staff (non-potable water)
- Water to support earthworks and road construction, including dust control and embankment conditioning
- Washdown of concrete trucks and other plant vehicles before leaving site
- Miscellaneous usage.

Commissioning will require water for various purposes (beyond normal steady-state operation), including:

- Flushing of piping, vessels, heat exchangers etc
- Initial fill of storage tanks
  - Raw water buffer tank
  - Demineralised water tank
  - Process water tanks
  - Cooling water circuits
  - Fire water tanks and piping
- Initial fill of boilers.

Operation of the WtE facility will require water to support a range of functions, including:

- Potable water for the administration building and visitor and education centre
- Process water (demineralised) to be used in the following plant functions:
  - Boiler make-up water treatment
  - Emission control reagent dilution water (for selective non catalytic reduction (SNCR) system)
- Process water (recirculated) will be used in the following plant functions:
  - APCr treatment and stabilisation
  - IBA extraction cooling and water seal
  - IBA treatment moisture control
  - Flue gas treatment
  - Equipment component cooler make-up water
  - Other site uses such as dust suppression, quenching and cleaning / washdown of process equipment (such as boiler tubes).
- Fire water for the on-site hydrant and sprinkler systems.

Refer to Figure 6 for a conceptual water balance for the Proposal.

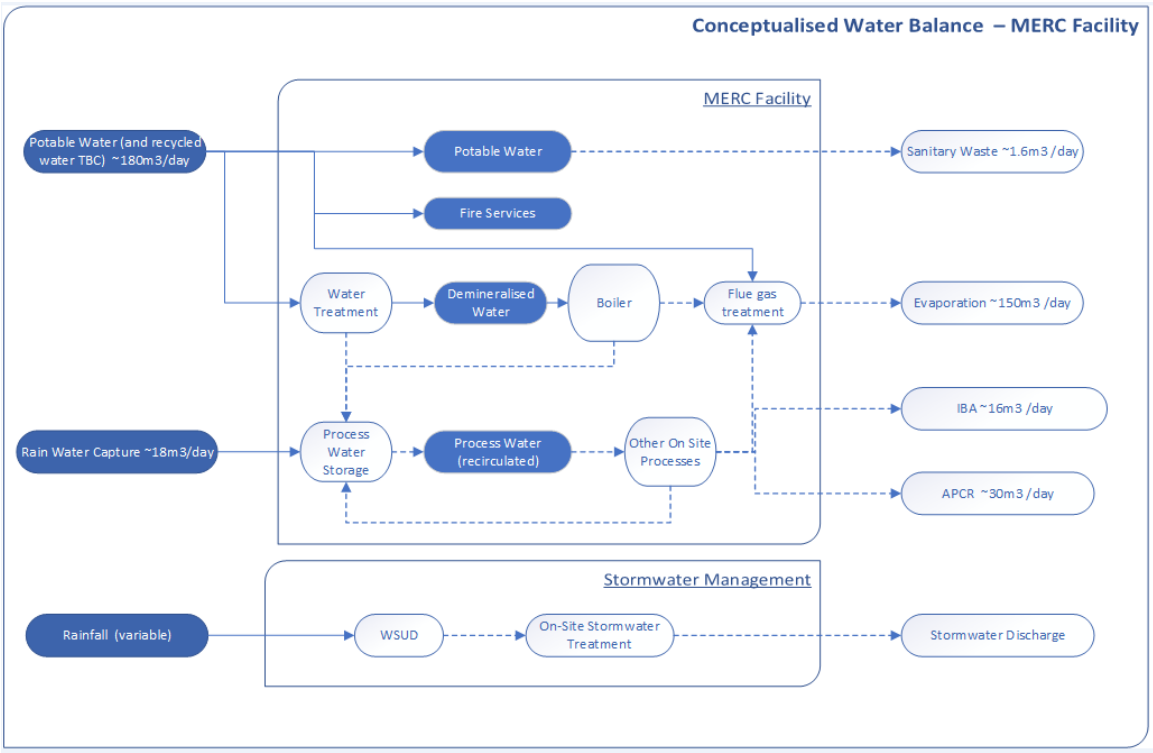


Figure 6: Conceptualised water balance for the Proposal

There are currently no existing connections to potable water or sewer to the Proposal. A new water main will be installed along Summerhill Road (west) to provide a potable water source to the Proposal. A connection to a Class A recycled water distribution system is also being considered to supplement potable water consumption by the MERC. Collection, storage and reuse of rainwater collected from roofs will be undertaken to offset potable water use by the Proposal. Stormwater runoff from non-roofed areas will be collected and managed onsite in accordance with *Best Practice Environmental Management (BPEM) Guidelines* (Victorian Stormwater Committee, 1999)). A septic tank will be installed to manage sanitary waste from the administrative building, process building, maintenance building and visitor and education centre.

Will the project discharge waste water or runoff to water environments?

☐ NYD ☒ No ☐ Yes If yes, specify types of discharges and which environments.

There will be no discharge of wastewater or runoff to water environments.

A key project objective is for no discharge of process wastewater as part of normal operations. Process wastewater streams will be re-used or managed onsite through a closed loop system.

Wastewater generated during construction will likely include:

- Sanitary waste from construction facilities
- Groundwater extracted during construction activities
- Runoff from washdown of concrete trucks and other plant vehicles before leaving site
- Site runoff.

Various commissioning processes will also produce wastewater. This includes:

- Flushing of piping, vessels, heat exchangers, etc.
- Excess boiler blowdown

Wastewater generated during construction and commissioning will be trucked off-site and disposed of at an appropriately licensed facility.

The WtE facility has been designed to ensure there will be no liquid discharge of process wastewater under normal operation, and that this discharge is reused within the facility**.** However, there may be non-standard or emergency scenarios where wastewater cannot be re-used and needs to be disposed of. All non-standard and/or emergency discharges are intended to be

managed by on-site collection of wastewater (such as within the process water pit or other pits/sumps located within the Proposal area), and then collected by an EPA accredited vacuum truck and disposed off-site in accordance with EPA requirements. For example, if there is a boiler outage requiring a boiler to be fully drained to the process water pit. This water would preferably be reused in the process, however, process wastewater in excess of process water consumption may be transferred to tanker trucks for suitable off-site wastewater disposal.

The majority of feedwater is required to provide make-up for evaporation losses into the flue gas system associated with operation of the SNCR and FGT systems and various boiler operations. Sanitary waste (such as from the toilets, showers and the staff canteen) produced by users of the facility will be treated using a proprietary on-site wastewater management system, such as a septic system. Treated water discharged from the sanitary wastewater treatment system will be used for irrigation of on-site landscaped areas.

There is no sewage infrastructure located on-site and there is not expected to be a need for regular discharges of wastewater, therefore a trade waste agreement is not anticipated to be required for the Proposal.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

☐ NYD ☒ No ☐ Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

The Proposal area is bound by two watercourses – Curly Sedge Creek and Tributary 4545 – located at the western and eastern edge of the boundary. Neither of these watercourses are impacted by the proposed activity.

Are any of these water environments likely to support threatened or migratory species?

☐ NYD ☒ No ☐ Yes If yes, specify which water environments.

Targeted surveys for Growling Grass Frog were conducted at all water bodies and inundated areas at 510 Summerhill Road. No Growling Grass Frogs were detected within the study area. However, the Merri Creek site contains moderate – high quality habitat for the species, based on aspects such as permanent hydrology of the site, good cover for fringing vegetation and the presence of terrestrial refugia.

The proposed development will not impact the Merri Creek and surrounding waterbodies, reducing the likelihood of impact to any Growling Grass Frogs present within the area.

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

☐ NYD ☒ No ☐ Yes If yes, please specify.

There are no wetlands within the Proposal area, or within the vicinity of the proposed development.

Could the project affect streamflows?

☐ NYD ☒ No ☐ Yes If yes, briefly describe implications for streamflows.

The Proposal will not affect stream flows. The Proposal area is located within the Yarra River Basin and Merri Creek Catchment. Curly Sedge Creek and its tributaries interact with the Proposal area before draining into the Merri Creek further south, but there is no direct impact to the watercourses from the proposed activity. The Proposal has undergone flood modelling to confirm there is no impact to streamflows.

Could regional groundwater resources be affected by the project?

☐ NYD ☒ No ☐ Yes If yes, describe in what way.

Regional groundwater resources will not be affected by the Proposal.

Site groundwater contains concentrations of copper, zinc and total nitrogen above adopted ecosystems criteria. The contaminant concentrations recorded across the site are considered likely to reflect regionally elevated levels. The groundwater is typically neutral to slightly acidic and of low salinity and would be non-aggressive to concrete or steel structures.

Although final groundwater management levels would need to be established following further groundwater investigation, based on the available results, if groundwater is intercepted during the planned works, it is likely that discharge to the local drainage system would be feasible subject to turbidity levels and assessment of water quality within nearby waterways.

Could environmental values (beneficial uses) of water environments be affected?

☐ NYD ☒ No ☐ Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies) The Proposal will not affect environmental values of water environments. There will be no discharge of process wastewater to the local environment as part of normal operations of the Proposal. Collection, storage and reuse of rainwater collected from roofs will be undertaken to manage stormwater runoff. In addition, a septic system will be installed to manage sanitary waste from the administration building, process building, maintenance building and visitor and education centre.
Could aquatic, estuarine or marine ecosystems be affected by the project? ☐ NYD ☒ No ☐ Yes If yes, describe in what way. The Proposal will not impact on aquatic, estuarine or marine ecosystems as part of construction or operational works. There is no planned works to intersect with Curly Sedge Creek or Tributary 4545.
Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term? ☒ No ☐ Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable. The Proposal will not have extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term. There is no planned works to intersect with Curly Sedge Creek or Tributary 4545.
Is mitigation of potential effects on water environments proposed? ☐ NYD ☐ No ☒ Yes If yes, please briefly describe. Potential risk of impacts to water environments during construction will be largely manageable through standard construction environmental management processes. This would include: • An approved Environmental Management Plan • An approved Soil and Water Management Plan (with specific regard to protection of Curly Sedge Creek) • An approved Commissioning Plan • Compliance inspections and/or audits to ensure contractor compliance to the EMP and Soil and Water Management Plan. Operational management measures will include: • A closed loop system (water) will be designed and installed such that there will be no discharge of process wastewater (in a liquid form) during normal operations • Bunding will be installed in sensitive areas in accordance with *EPA Publication 1698 Liquid Storage and Handling Guidelines* • Water quality monitoring will be undertaken in accordance with an approved monitoring plan • The design will include two on-site detention basins that are sized to meet the City of Whittlesea Permissible Site Discharge rates and maintain flow to the 1.5 Year ARI ore-developed peak flow as required by BPEM Guidelines • The design will incorporate water sensitive urban design elements to meet BPEM pollutant reduction targets • Design elements involving the storage or processing of potentially hazardous waste will be located outside the 1% AEP flood extents and above the PMF flood level to comply with DELWP regulations • Earthworks will avoid impacting Curly Sedge Creek Tributary 4545 and remain at least 10m from the waterway 'top of bank' • Potential downstream flood impacts will be mitigated by the inclusion of two on-site detention basins.
Other information/comments? (eg. accuracy of information) N/A

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?

☐ No ☒ Yes If yes, please attach.

A Landscape Character and Visual Impact Assessment (Arup, 2023) has been prepared for the Proposal (refer to Attachment 7).

Is the project to be located either within or near an area that is:

- **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?**

☐ NYD ☐ No ☒ Yes If yes, provide plan showing footprint relative to overlay.

The north-east corner of the Proposal area is affected by the Environmental Significance Overlay – Schedule 4 (ESO4) (refer to Figure 7). No buildings and works are proposed within the extent of the ESO4 affected area. A detailed summary of the local planning overlays applicable to the Proposal is provided in Section 7.

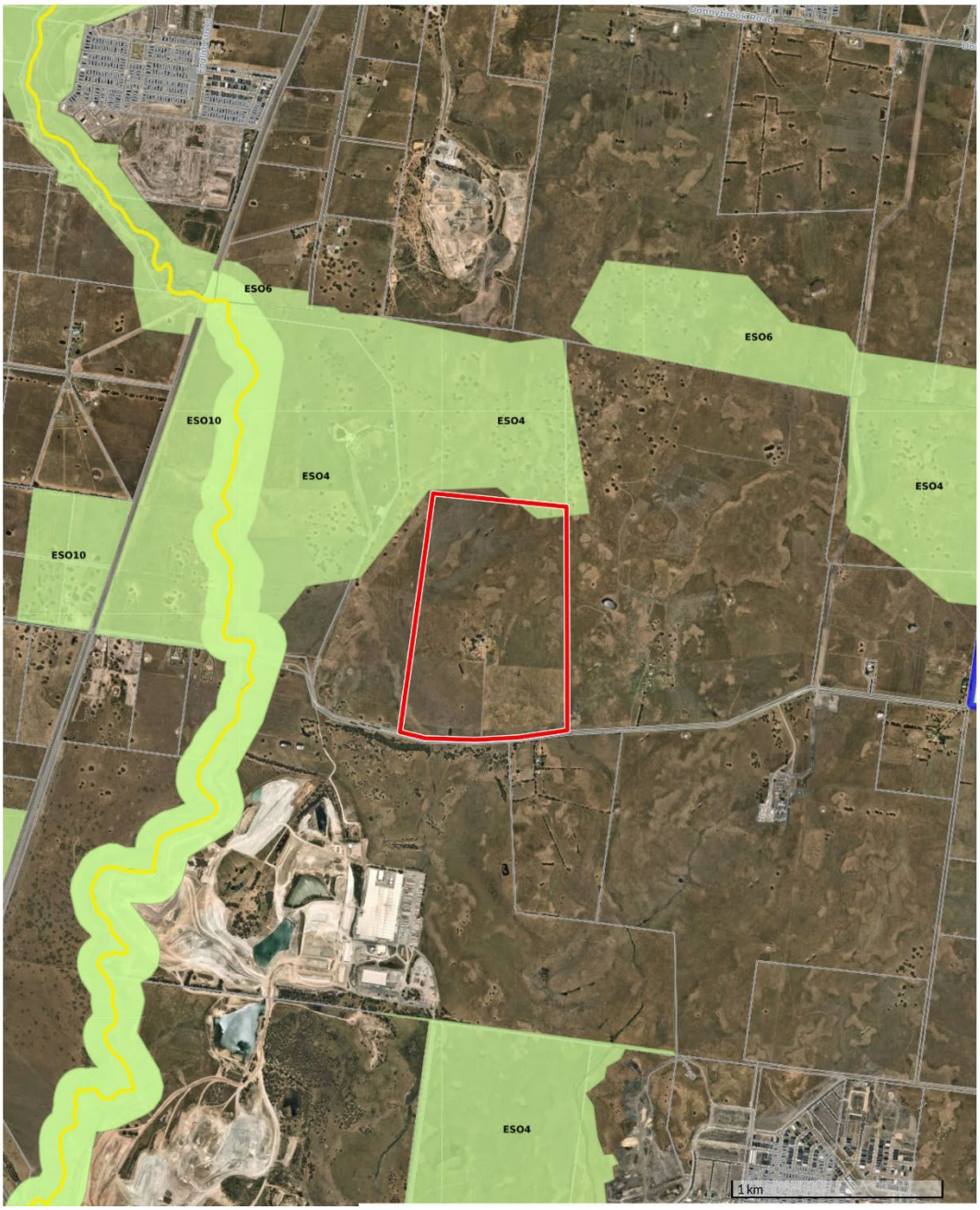


Figure 7: ESO4 overlay plan

- **Identified as of regional or State significance in a reputable study of landscape values?**

☐ NYD ☒ No ☐ Yes If yes, please specify.

The Proposal area is not located in an area that is of regional or State significance.

- **Within or adjoining land reserved under the *National Parks Act 1975* ?**

☐ NYD ☒ No ☐ Yes If yes, please specify.

The Proposal is not located within or adjoining land reserved under the *National Parks Act 1975*.

- **Within or adjoining other public land used for conservation or recreational purposes ?**

☐ NYD ☒ No ☐ Yes If yes, please specify.

The Proposal is not located within or adjoining other public land used for conservation or recreational purposes.

Is any clearing vegetation or alteration of landforms likely to affect landscape values?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

The impact of the Proposal is not considered to be incongruous to the character of the surrounding Landscape Character Areas (LCAs) with regards to the existing quarry and industrial land uses in close proximity to the Proposal.

The physical impact to the landscape character during construction would be concentrated to the immediate proposed site extents.

Visual impacts during construction are expected to result from the presence of machinery including cranes which would be visible during the construction phase. The impacts related to this phase will be temporary in nature.

Vegetation screening around the perimeter of the site will assist in the mitigation of visual impact during operation. Choices in colour and materials palette and keeping the building height to a minimum has aimed to mitigate impacts.

Is there a potential for effects on landscape values of regional or State importance?

☐ NYD ☒ No ☐ Yes Please briefly explain response.

There are no landscapes of regional or State importance within the area, therefore the landscape impact will be local in nature.

There will be a visual impact to the surrounding landscape from the development of the proposed facility, however the proposed use will align with the surrounding existing industrial uses and future proposed developments.

Is mitigation of potential landscape effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Mitigation measures have been adopted within the proposed design to screen the building and minimise visual impact. The architectural design has focused on minimising the overall height of the building where possible and proposes a selection of colours and materials to allow the building to appear recessive above the skyline.

The landscape design response proposes trees, shrubs and earth mounds to screen the building from the adjoining properties and Summerhill Road. This will be planted with a native grass mix to complement the existing vegetation typology (grass plains). The earth mounds are to be built using site excavated materials and will act as amenity and screening features, as well as sound dissipating elements. Landscape treatment will extend throughout the Proposal area for amenity, shade, to improve biodiversity and to screen the visitor and public access areas from the operational side of the facility.

Refer to Attachment 8.

Other information/comments? (eg. accuracy of information)

N/A

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils

Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?
☐ NYD ☒ No ☐ Yes If yes, please briefly describe.
There is no potential for effects on land stability, acid sulphate soils (ASS) or highly erodible soils.

Based on the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) Atlas of Australian Acid Sulfate Soils, the probability of ASS occurring within the Proposal area is classed as between extremely low (between 1-5%) and low (6-70%) probability.

Soil conditions at the side typically comprise a 0.2m – 2.9m thick layer (average thickness of 1.0m) of very stiff and hard, high plasticity, silty clay overlying basalt rock. Exception to this is noted in the south-east of the site where up to 2.3m of imported fill was located, and in the vicinity of the existing site buildings where between 0.2-0.7m of fill (predominantly comprising reworked natural soil) was encountered.

Are there geotechnical hazards that may either affect the project or be affected by it?
☐ NYD ☒ No ☐ Yes If yes, please briefly describe.
There are no major geotechnical hazards that could affect the Proposal.

Other information/comments? (eg. accuracy of information)
N/A

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

☐ NYD ☒ No ☐ Yes If yes, provide estimate of traffic volume(s) if practicable.

The Proposal is not anticipated to generate significant volumes of road traffic during construction or operation.

Construction phase

A Construction Traffic Management Plan will be prepared prior to construction of the Proposal. Traffic predictions during the construction phase for MERC are:

- The peak daily construction vehicle movements are estimated to be 75 two-way per day. It is estimated that there will be seven two-way construction vehicle movements per hour
- It is estimated that the Proposal will create 800 direct construction jobs over the three-year construction period. The peak number of workers likely to be onsite over construction would be 600 per day.

Operation phase

A total average of 300 vehicle movement per day will be generated by the Proposal, generally split between arrivals (150 arrival movements) and departures (150 departure movements). Fewer vehicles are expected on Saturdays and even fewer on Sundays (restricted to staff and contractor vehicles only).

The proposed facility will operate 24 hours per day, seven days per week (365 days per year). The delivery hours will be 12 hours per day between 6am – 6pm. The delivery days will be six per week (Monday to Saturday). This equates to approximately 312 delivery days per year.

A range of heavy vehicles are expected to visit the proposed facility, with the largest being up to 36.5m long A-Double. An A-Double comprises a prime move towing two trailers. The first trailer is connected to the prime mover by a roll coupled connection, and the second trailer is a dog trailer.

Trucks depositing materials at the site are expected to arrive from and return to various locations across Greater Melbourne. It is anticipated that travel will be to/from:

- Cleanaway, Dandenong South
- Boral Cement, Somerton
- Port Melbourne
- Omega Chemicals, Laverton North
- Various municipalities across the Metropolitan Melbourne waste catchment area.

With consideration of the level and type of traffic projected to be generated by the proposed facility, the existing Summerhill Road (to the west of Merri Creek) and Amaroo Road configurations are adequate to accommodate the anticipated traffic generated by the Proposal. However, the existing unsealed section of Summerhill Road between Merri Creek and the eastern site access may need to be upgraded to a sealed standard with a pavement width of approximately 6.5m to be consistent with the existing arrangement to the west of Merri Creek. Furthermore, given the Merri Creek bridge has a single width carriageway and restricted sightlines on the approaches, some form of traffic management will likely be required to manage vehicle movements across it in one direction at a time.

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

As part of the DLA, a range of high-level technical assessments have been undertaken to assess the risk to human health and the environment from the MERC. The results from these studies indicate that based on the concept design there is no significant impact anticipated to the local community from the WtE facility.

Noise and vibration

The initial Noise and Vibration assessment identified that during construction there is a risk of exceeding construction noise management levels at residential receivers based on the conservative scenarios assessed for each construction phase. However, with the implementation of standard construction mitigation measures, this risk is reduced to low, therefore minimising the

potential impact to sensitive receptors. Construction scenarios will be planned and managed via a Construction Noise and Vibration Management Plan. In addition, the distance between the expected construction site boundary and the nearest residential building are greater than the typical minimum safe working distances of expected vibration generating sources. Based on this assessment, vibration issues to building structure and human comfort are unlikely to be an issue.

During operation, there are no expected exceedances of the Noise Protocol day-time or night-time limits for surrounding residential receptors, with the exception of one sensitive receiver (475 Summerhill Road) located approximately 110m from the site. Mitigation measures will be put in place to minimise impact, including controls on the number of trucks entering the facility, ensuring unloading /loading takes place in enclosed spaces, constructing a noise barrier / earth bund to mitigate noise, glazing to affected residential property and including acoustically treated louvres on the south and east side of the main WtE building. The assessment showed that there would be no exceedances of the Noise Protocol evening-time limits during operation.

Air emissions

The initial Air Quality assessment showed that for the daily average air quality modelling results the proposed emission limit settings (based on the upper end of the BAT-AEL range associated with implementation of BAT for emission control and flue gas treatment) the Proposal (in isolation) is predicted to have an insignificant impact on air quality during operation of the facility, as measured against the relevant health-based and environmental based Air Pollution Assessment Criteria (APAC).

Construction related impacts indicate a negligible to low risk to human health and a low to medium risk to dust soiling and ecological receptors prior to mitigation. Cleanaway will adopt appropriate mitigation measures, including preparation of a Construction Dust Management Plan, which will ensure the residual effect of construction is not significant.

Predicted cumulative ground-level concentrations (including sources of emission from industry surrounding the proposed development) of all air pollutants comply with the relevant APACs across all sensitive receptors, with the exception of hydrogen fluoride, PM_{10} and $PM_{2.5}$. The elevated PM_{10}, $PM_{2.5}$ and hydrogen fluoride ground level concentrations are a result of elevated background concentrations (from surrounding industry and historical off-site bushfire activity) as there are no additional days when concentrations of PM_{10} and $PM_{2.5}$ are predicted to be higher than the 24-hour average air quality criterion as a result of the Project. For a further breakdown of air emissions from the MERC in isolation and cumulatively with surrounding industry, refer to Section 19.

Odour

A preliminary Level 2 Odour Assessment (EPA Publication 1883) identified that the risk of adverse odour impacts due to the Proposal is low. The waste receival hall has been designed to maintain a negative pressure to contain fugitive odour and dust, with primary combustion air drawn from this area. In addition, waste deliveries will be in fully enclosed waste delivery vehicles, no waste will be tipped outside of the waste receival hall and a stand-by Odour Control Unit will be provided to deodorise the air in the waste receival hall and waste bunker area during a full plant outage (e.g., when both grate-boiler lines are shut-down for maintenance and maintenance is being undertaken in that section of the plant). As a result of the proposed design and operational mitigation measures, odour is considered a low risk.

Plume visibility

An initial Plume Visibility assessment showed that during operation of the facility and based on the proposed boiler capacity and selected FGT system design, the maximum height above the ground at which the plume would be visible ranges from 69m – 138m above ground-level. The horizontal extent that the plume would be visible ranges from 1 – 123.5m downwind, with an average horizontal extent of 28.8m. In terms of the visible plume extending beyond the site boundary, site plans showed that the distance from the stack to the closest boundary is 214m, as such the visible plume will be contained within the Proposal area. During a five-year modelling period, the plume will only potentially be visible for 2% of the time.

In addition, the Civil Aviation Safety Authority (CASA) assessment concluded that the plume will be outside the Obstacle Limitation Surfaces (OLS) for Melbourne Airport. At the plume heights indicated and applying a plume velocity of 10.6m/s (due to the distance of the Proposal from

Melbourne Airport), CASA does not require any lighting or marking for the stack and plume. Further reducing the visible effects to the local community.

Traffic

Refer to the previous section for information on the construction and operational traffic generated by the Proposal. The initial transport assessment identified that the level of traffic generated as a result of the Proposal will be adequately accommodated by the wider road network, including Summerhill Road and Amaroo Road configurations. Given the surrounding existing land uses, despite the volume of traffic generated by the Proposal being significant, the impact to the local community is anticipated to be low.

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the hazards and possible implications.

A preliminary Human Health Risk Assessment concluded that there are no health issues of concern in relation to air quality, noise or chemical hazards for the local community.

In particular, the assessment shows:

- No unacceptable risks for criteria pollutants (NOx, SOx, CO, $PM_{2.5}$, PM_{10}) from the Proposal
- No unacceptable risks for short-term exposures from the proposed facility modelled for the closest off-site location (note all other locations beyond this will have an even lower concentration exposure)
- No unacceptable risks for relevant exposure scenarios considering long-term exposures (both via inhalation and after deposition onto soil and uptake into home grown produce) at:
    - Closest off-site location
    - Closest residential location
    - Closest commercial / industrial location
    - Closest to other places location (including farms)
    - Closest on-site location
- No unacceptable risks for relevant exposure scenarios for rainwater tanks.

With consideration of the noise limits adopted and the assessment of noise impacts from the Proposal, where the Proposal is designed to meet the noise specifications identified (i.e. predicted levels), and the identified noise mitigation measures are implemented, there are no health issues of concern in relation to noise for the Proposal.

The assessment also identified that there are no health issues of concern in relation to water, soil contamination, groundwater or dangerous goods / chemical hazards in relation to the Proposal.

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

☐ NYD ☒ No ☐ Yes If yes, briefly describe potential effects.

There will be no displacement of residences or severance of residential access to community resources due to the proposed development. The proposed location for the MERC has already been acquired by Cleanaway (including the existing residential building onsite).

Are non-residential land use activities likely to be displaced as a result of the project?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the likely effects.

The proposed site currently occupies farming activities, including livestock grazing. This activity will be displaced as a result of the Proposal. The proposed location for the MERC has already been acquired by Cleanaway (including the existing residential building onsite).

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the potential effects.

There may be some temporary access disruptions for the local community during the construction phase. However, Cleanaway will work with the relevant stakeholders and the community to ensure disruptions are minimised where possible

Is mitigation of potential social effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

A preliminary Socioeconomic Assessment has been prepared for the Proposal and outlines proposed mitigation measures and controls to avoid impacts to the local community.

Other information/comments? (eg. accuracy of information)

N/A

Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

☐ No If no, list any organisations that it is proposed to consult.
☒ Yes If yes, list the organisations so far consulted.

Consultation and engagement with the Registered Aboriginal Party (RAP) has commenced as part of the DLA and Planning Permit approval processes.

A Cultural Heritage Management Plan (CHMP) (Complex Assessment) is currently being prepared. The Traditional Owners for the Proposal are the Wurundjeri People who are represented by the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation. A Standard Assessment was undertaken 24-25 November 2022 with the findings presented to Wurundjeri on 15 December 2022. The RAP agreed for the Complex Assessment to be limited to the proposed area of impact of the activity (the southern portion of the Proposal area).

What investigations of cultural heritage in the project area have been done?
(attach details of method and results of any surveys for the project & describe their accuracy)

A Complex CHMP is currently being prepared for the Proposal. An Activity Area has been defined for the CHMP which includes the Proposal area and all areas upon which development related to the MERC will take place.

The desktop assessment identified a total of 174 Aboriginal Places, with a total of 774 components within the Activity Area. The majority of these places are located near the existing waterways (Curly Sedge Creek and Tributary 4545). Based on this, it is highly likely that Aboriginal cultural heritage will be present within the Activity Area, and as a result a Standard Assessment was undertaken.

The Standard Assessment identified the following:

- The Standard Assessment survey confirmed the landforms identified during the desktop assessment, including three main landforms: plain, stony rise and a creek line
- The Volcanic Plain covers most of the Activity Area and is located along the roads and within the Proposal area
- The creek landform is located within the creek line which intersects with Summerhill Road in the eastern section of the Activity Area
- No new Aboriginal Places were identified during the Standard Assessment walkover
- Several areas of previous ground disturbance were located across the site, including driveways, roads, sheds / housing, transmission lines, dams, rail crossings, water utilities and a paved driveway.

A Complex Assessment for the CHMP has not yet been undertaken but is planned for mid-2023.

Is any Aboriginal cultural heritage known from the project area?

☐ NYD ☐ No ☒ Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby
- Sites or areas of sensitivity identified by representatives of Indigenous organisations

As above.

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

☐ NYD ☒ No ☐ Yes If yes, please list.

There are no identified matters of historic heritage within the Proposal area, or within 2km of the Proposal.

Is mitigation of potential cultural heritage effects proposed?

☒ NYD ☐ No ☐ Yes If yes, please briefly describe.

Unknown at this stage.

Other information/comments? (eg. accuracy of information)

N/A

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

- ☒ Electricity network. If possible, estimate power requirement/output …….
- ☒ Natural gas network. If possible, estimate gas requirement/output ……..
- ☒ Generated on-site. If possible, estimate power capacity/output …….
- ☒ Other. Please describe.

Please add any relevant additional information.

The WtE process would generate approximate 46.3MW of gross electricity, 4.7MW of which would be used to power the facility itself and the associated on-site by-product and residue treatment processes, with 41.6MW (328,700MWh/year) exported to the grid as base load electricity. In addition to supplying electricity to the grid, there is also potential to supply energy in the form of heat and/or process steam to local industrial users.

An Emergency Diesel Generator will provide back-up power to key plant and equipment to aid safe shutdown in the event of a major power failure. This will contribute approximately 2MW when it is started-up periodically for testing purposes. As such, the MERC main transformer will be sized for approximately 53MW electrical capacity.

What are the main forms of waste that would be generated by the project facility?

- ☒ Wastewater. Describe briefly.
- ☒ Solid chemical wastes. Describe briefly.
- ☒ Excavated material. Describe briefly.
- ☒ Other. Describe briefly.

Please provide relevant further information, including proposed management of wastes.

Wastewater

Water handled onsite, including process water from the WtE process, will be contained and recirculated for reuse within a closed loop system on-site. A gravity sewer system will convey wastewater from welfare facilities in the WtE building and visit and education centre to a proprietary on-site wastewater management system. Treated water discharged from the sanitary wastewater treatment system will be used for irrigation of on-site landscaped areas.

Solid chemical wastes

The characteristics and classification of the thermal treatment residue streams informs appropriate on-site handling and pathways for recovery or disposal. The MERC preferred approach is to establish recycling pathways where possible, whilst also identifying appropriate disposal options, so that environmental protection is maintained if recycling outlets are unavailable.

The main WtE residues and by-products are IBA and APCr:

- IBA is expected to be classified as Industrial waste (until a suitable commercial reuse pathway is established) after maturation and sorting (to recover recyclable ferrous and non-ferrous metals) to produce an aggregate (IBAA) suitable for commercial reuse as a civil construction material. Classification, regulation, and reuse of IBAA is common practice in both the UK and Europe
- APCr (including fly ash) is expected to be Category A reportable priority waste before stabilisation, and Category B after stabilisation with cement and water, if an alternative proven treatment process is not available.

Excavated material

The largest waste stream arising from the construction phase of the MERC will be spoil (soil and rock) from the excavation and site enabling works. Ground investigations at the site identified a low risk of contamination and the material type is likely to be suitable for re-use. Preliminary earthworks design indicates no net export of material from the site will be required, with surplus from cut/fill balance to be re-used onsite for landscape design purposes.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

- ☒ Less than 50,000 tonnes of CO_2 equivalent per annum
- ☒ Between 50,000 and 100,000 tonnes of CO_2 equivalent per annum

☒ Between 100,000 and 200,000 tonnes of CO_2 equivalent per annum
☒ More than 200,000 tonnes of CO_2 equivalent per annum

Please add any relevant additional information, including any identified mitigation options.

The draft GHG assessment estimates that the GHG emissions resulting from the construction of the MERC facility will be approximately 42tCO_2-e/y in Scope 1 emissions from on-site diesel fuel usage during construction and 16,090 tCO_2-e in Scope 3 emissions associated with embodied carbon of major construction materials and transport of major construction materials.

The draft GHG assessment estimates that direct annual GHG emissions associated with the operation of the MERC facility will be approximately 193,000tCO_2-e/y. This includes the emissions associated with waste combustion, vehicle use (including waste transportation), and energy required to operate the facility, and assumes a waste stream comprising 60% C&I waste and 40% MSW.

The draft GHG assessment estimates that these direct annual GHG emissions could be reduced to approximately 191,500tCO_2e/y by replacing diesel with biodiesel for the operation of stationary plant and reduced further by designing the plant for maximum energy efficiency.

The waste stream is anticipated to evolve over the design life of the MERC facility. The draft GHG assessment estimates that changing the waste stream to 40% C&I waste and 60% MSW would decrease direct annual GHG emissions to approximately 175,000tCO_2-e/y (or 173,500tCO_2-e/y if using biodiesel to operate stationary plant). However, the Australian Government's target of reducing food waste by 50% by 2030 may have the opposite effect.

The draft GHG assessment therefore estimates that direct GHG emissions resulting from the operation of the Proposal would contribute between approximately 0.21% and 0.23% to Victoria's current GHG emissions and between approximately 0.036% 0.040% to Australia's current GHG emissions, depending on the assumed waste composition and use of biodiesel (Table 2). However, as the Australian economy decarbonises towards the commitment of net zero emissions in 2050[4,5] the relative contribution of the Proposal's gross GHG emissions to state and national emissions is likely to increase.

Table 2: Contribution of the Proposal's direct GHG emissions to Victoria's and Australia's current emissions

	MERC	Victoria		Australia	
Assumptions	**Direct emissions ($ktCO_2e/y$)**	**Current emissions ($ktCO_2e/y$)[6]**	**% Increase**	**Current emissions ($ktCO_2e/y$)[7]**	**% Increase**
Diesel used with 60:40% C&I:MSW	193.1	83,800	0.23%	487,100	0.040%
Biodiesel used with 40:60% C&I:MSW	173.5	83,800	0.21%	487,100	0.036%

Conversely, the Proposal may also result in the avoidance of indirect GHG emissions from several sources:

- The diversion of waste material from landfill which will avoid landfill methane emissions
- The production of an alternative source of electricity with a lower emissions intensity than many other traditional sources of energy production, including grid electricity
- Recovering recyclable materials following waste incineration including ferrous and non-ferrous metals and bottom ash which can be substituted for virgin materials during construction.

[4] Climate Change Act 2022, Australian Government, available online at: https://www.legislation.gov.au/Details/C2022A00037
[5] Climate Change Act (Victoria) 2017, Victoria State Government, available online at: https://www.climatechange.vic.gov.au/legislation/climate-change-act-2017
[6] 2020 data, includes Land Use, Land-Use Change and Forestry UNFCCC offsets (DCCEE&W, 2020c)
[7] Data for year to March 2022 (DCCEE&W, 2022)

However, there is significant uncertainty associated with the avoidance of GHG emissions due to anticipated changes in waste composition, increases in the efficiency of landfill gas capture, and a wider decarbonisation of the economy, including a reduction in emissions intensity of the Victorian electricity grid. Over the coming decades, these changes are expected to reduce (or even remove) any potential for the avoidance of GHG emissions from the MERC facility in the future. Irrespective of the future net GHG emissions in the longer-term, the MERC facility will still respect the waste hierarchy by recovering resources and energy from residual waste which would otherwise be destined for landfill disposal, thus preserving existing valuable landfill airspace and potentially avoiding the need to build new putrescible landfills in the future.

The draft GHG assessment estimates that the Proposal may result in the avoidance of between approximately 439,000 and 444,000tCO_2e/y and therefore create a net reduction in Victoria's and Australia's annual GHG emissions of between -235,200 and -259,200tCO_2e/y. These estimates are based on a set of discrete assumptions which are outlined in Table 3 and are more indicative of a current scenario than a future scenario.

Table 3: A summary of net GHG emissions resulting from the Proposal, based on the set of discrete assumptions outlined. All figures are in ktCO_2e.

Emissions Source	Assumptions	Diesel used with 60:40% C&I:MSW	Biodiesel used with 40:60% C&I:MSW
Landfill gas	Avoided methane emissions are based on 65% efficiency for landfill gas capture and associated electricity generation from landfill gas.	-104.3	-108.7
Electricity	Avoided emissions from electricity generation are based on Victoria's electricity generation emissions factor as per the current National Greenhouse gas Accounts (NGA) Factors	-279.5	
Construction materials	Avoided emissions from recovered virgin materials (ferrous and non-ferrous metals and alternative construction aggregate) based on current emissions intensity for producing virgin materials	-55.4	
Direct emissions (scope 1 & 2)	Based on the assumptions in Table 2	193.1	173.5
Indirect emissions (scope 3)	Associated with materials used in plant operation and worker transport	10.9	
Net emissions	Operational emissions (scope 1, 2 & 3) – avoided indirect emissions.	-235.2	-259.2

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

☒ No ☐ Yes If yes, briefly describe.

All potential environmental issues arising from the proposed development have been discussed in the preceding sections of this referral.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects? (if not already described above)

☒ Siting: Please describe briefly

The proposed site is constrained by several easements and interactions with neighbouring property and uses, including an easement for high voltage power transmission lines, quarry blast zone, sensitive use buffer zone and flood affected areas. The siting and design of the facility has considered these constraints when locating buildings at the southern end of the site, avoiding the transmission line, ESO4 and areas of Aboriginal cultural heritage sensitivity (refer to Attachment 6).

☒ Design: Please describe briefly

The WtE building will be primarily Slab-On-Grade ground floor (due to the shallow depth of the bedrock) with some areas of suspended slab at the boiler hall and FGT hall. The main building will be steel framed and steel clad, approximately 56m high, 189m long and 65m wide, with a lightweight roof envelope designed to resist wind pressures and contain the WtE process and equipment. The flue gas stack is approximately 60m tall, supported in piled foundations. Pile foundations will be required to resist overturning movement due to wind loading.

The existing site comprises two main drainage catchments defined by a north-south ridgeline which is located east of the current farmhouse access track. To avoid catchment re-distribution and reduce off-site impacts, the design maintains this catchment boundary. Circulatory access roads and hardstands have therefore been designed with crests close to the existing ridge line.

Finished floor levels of buildings have been set above the 1% AEP flood event with freeboard. Hardstands drain away from the buildings towards the stormwater systems positioned under the outside of the hardstand.

The WtE process is designed in accordance with BAT to minimise impacts on air, water, odour and noise emissions (as detailed throughout this referral application).

The waste bunker is sealed to avoid leachate escape into groundwater. There is also a dedicated IBA leachate pond in the IBA facility area to contain run-off for reuse (avoiding contaminants escaping into surface runoff / groundwater).

☒ Environmental management: Please describe briefly.

The MERC facility meets the Prescribed Activity definition for A08: Waste to Energy (under the EP Act 2017) which triggers a requirement for a Development License. A Development License Application (DLA) is currently being prepared and will be submitted to EPA Victoria in April 2023. The Proposal has also considered the best available techniques and technologies, in the context of the EU and legislative directives, which the Victorian EPA is using as the benchmark to regulate emissions from WtE Proposals. In addition, the Proposal is consistent with the *Recycling and Waste Reduction Act (2020)* and the Victorian Waste to Energy Framework (DELWP, 2021).

As part of the DLA, nine high-level environmental assessments are being drafted, including:

- Air Quality assessment
- Greenhouse Gas assessment
- Climate Change assessment
- Noise and Vibration assessment
- Human Health assessment
- Hydrology and Flooding assessment
- Land and Groundwater assessment
- Waste management assessment
- Hazardous substances and industrial risks assessment.

In addition, extensive community and stakeholder consultation is planned for the Proposal. Further detail on engagement undertaken to date, and planned for the future, is outlined in Section 20.

The facility will be delivered in accordance with Cleanaway ISO 14001 certified Environmental Management System (EMS). As part of the DLA, a suite of environmental management documentation is proposed, refer to Table 4.

Monitoring and audit frequency and type will be developed and implemented using a risk-based approach as part of an auditing plan developed by Cleanaway prior to works commencing. This will include:

- Regular review of risks and control measures
- Regular site inspections
- Internal audit by Cleanaway
- External audit by independent auditors in compliance with ISO 14001.

Table 4: Proposed environmental management plans

Management Plans	
Construction	**Operation**
• Environmental Management Plan • Construction Environmental Management Plan • Air Quality Management Plan (Commissioning) • Communications and Stakeholder Engagement Plan • Construction Dust Management Plan • Construction Noise and Vibration Management Plan • Construction Traffic Management Plan • Construction Waste Management Plan • Construction Emergency Response Plan • Cultural Heritage Management Plan • Kangaroo Management Plan • Groundwater Management Plan • Soil and Water Management Plan • Spoil Management Plan • Weed Management Plan • Vegetation/Ecology Management Plan • Stormwater Monitoring Plan	• Operational Environmental Management Plan • Air Quality Management Plan (Operations Phase) • Odour Management Plan • Operational (IBA) Dust Management Plan • Firewater Management Plan • Green Travel Plan • Hazardous Materials Management Plan • Operational Noise and Vibration Management Plan • Operational Traffic Management Plan • Operational Waste Management Plan • Operational Risk Management and Monitoring Plan • OTNOC (Other Than Normal Operating Condition) Management Plan • Waste Feedstock Management Plan • Environmental Reporting Plan • CEMS QA/QC Plan

☒ Other: Please describe briefly

N/A

Add any relevant additional information.

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

☒ NYD ☒ No ☒ Yes If yes, briefly describe.

The Proposal is located in close proximity three existing industrial activities that have the potential to contribute to cumulative impacts for Air Quality and Noise and Vibration. All three activities are within 2.2km of the Proposal and are as follows:

- Austral Bricks Wollert Plant
- Wollert Compressor Station
- Mountain View Quarries – Donnybrook.

Air Quality

An initial cumulative assessment was conducted incorporating the adjacent Austral Bricks owned Brickworks and ambient background concentrations from EPA Victoria's monitoring station at Alphington. Brickworks has been explicitly modelled as the review of the National Pollutant Inventory data identified it as a key source of emissions in the area. Austral Bricks supplied the stack and building dimension data, and licensed emission limits required to undertake the cumulative dispersion modelling assessment.

Refer to Table 3 for results.

Table 5: Modelled emission pollutants against the relevant APACs

Modelled emission pollutant	% of respective **health-based APAC** at all off-site sensitive receptors locations		% of respective **environmental-based APAC** at all off-site sensitive receptors locations	
	MERC modelled in **isolation**	MERC modelled with **cumulative** emissions	MERC modelled in **isolation**	MERC modelled with **cumulative** emissions
NO2 maximum 1-hour annual average ground-level concentrations	6.3%	71.4%	0.7%	68.0%
SO2 maximum 1-hour, 24-hour and annual average ground-level concentrations	4.1%	77.3%	0.9%	27.3%
CO maximum 8-hour average ground-level concentrations	0.1%	12.2%	N/A	N/A
HCl maximum 1-hour and annual average ground-level concentrations	0.2%	19.9%	N/A	N/A
HF maximum 1-hour and 24-hour average ground-level concentrations	0.5%	10.6%	5.2%	135%
NH3 maximum 1-hour, 24-hour and annual average ground-level concentrations	0.1%	Not available	0.7%	Not available

PCDD/F annual average ground-level concentrations	0.001%	0.001%	N/A	N/A
PM10 maximum 24-hour and annual average ground-level concentrations	0.8%	452%	N/A	N/A
PM2.5 maximum 24-hour and annual average ground-level concentrations	1.6%	169%	N/A	N/A
Maximum predicted ground-level concentrations of any metal	Compliant	Compliant	Compliant	Compliant

The daily average air quality modelling results demonstrate that with the proposed emission limit settings, based on the upper end of the BAT-AEL range associated with implementation of BAT for emission control and flue gas treatment, the Proposal (in isolation) is predicted to have an insignificant impact on air quality, as measured against the relevant health-based and environmental based APACs.

Noise and vibration

Cumulative impacts from surrounding existing industry related to noise and vibration has been considered in the initial noise assessment, and therefore the proposed mitigation and management measures take into account these additional sources. The outcome from the noise and vibration assessment is presented in Section 15.

Site investigation was conducted to understand the noise levels in vicinity of the Proposal area and nearest noise sensitive receivers. Noise data collected included ambient noise from other nearby industrial sites including Mountain View Quarries Donnybrook, Austral Bricks Wollert and APA Western Outer Ring Main Wollert Compressor Station. It is understood that is it likely that at least one of the adjacent sites will operate during the night-time hours where the cumulative noise contribution is most critical for the site noise criteria.

Human Health

The initial HHRA modelled showed that for all scenarios, the MERC is below the relevant human health guidelines (enHealth) in both isolation and cumulatively with surrounding facilities.
The potential for impacts on human health due to long term exposure scenarios were assessed using annual average ground level concentrations for the cumulative case. The cumulative case considered existing air quality in Wollert, estimated emissions from the facility, as well as emissions to air from the Austral Bricks facility to the south.

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

☒ No ☐ Yes If yes, please list here and attach if relevant.

Has a program for future environmental studies been developed?

☒ No ☐ Yes If yes, briefly describe.

Consultation program

Has a consultation program conducted to date for the project?

☐ No ☒ Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

As part of the preparation of the DLA and Planning Permit application, engagement with the local community and key stakeholders has already commenced for the MERC.

Cleanaway intends to undertake meaningful dialogue with stakeholders and the community to build their understanding of the proposed technology, the need for it, and to be adequately informed of the Proposal. Cleanaway is committed to engaging with all stakeholders, including community members, local businesses, associations, agencies, regulatory authorities, and State and local government members.

Cleanaway is approaching engagement for the MERC in multiple phases. This provides key stakeholders and the community sufficient time and opportunities to learn about the Proposal and share their knowledge with the project team. It also enables Cleanaway to share detailed information about the Proposal at the earliest possible time, once information about the Proposal is available. This approach also factors in sufficient time for Cleanaway and its consultants to adjust the engagement approach to suit the needs of community and stakeholders.

The four phases of engagement are as follows:

- Phase One: Introduction to the WtE process and provision of policy context
- Phase Two: Soft launch of the MERC including project website launch, project flyer, email notifications and project hotline
- Phase Three: Formal launch of the MERC including online and face-to-face information sessions, community events and targeted meetings
- Phase Four: DLA and planning permit submission and public exhibition.

Phase One engagement (October – November 2022) involved:

- Market research to understand the community's level of understanding and acceptance of the WtE process and technology
- The MERC Proposal was not publicly advertised to the local community. Instead, engagement was targeted to specific regulators and government stakeholders
- Three online focus groups were held, and an online survey was promoted through social-media advertising targeting people who live in metropolitan Melbourne, and through existing networks with community groups. Over 50 Victorians participated through either attending a focus group, completing an online survey, or joining a targeted interview.

Phase Two engagement (December 2022) marked the first public announcement of the MERC on 5 December 2022 and involved:

- The launch of the MERC project website (https://caportal.com.au/cleanaway/merc) The website includes the location of the MERC, information about the proposed WtE technology, project benefits and likely timing of planned works
- A project flyer was delivered to approximately 26,500 households within a 5km radius of the proposed MERC

- An email announcement was circulated to existing project stakeholders (late 2022 and early 2023)
- Project launch announcement was included in Cleanaway's community newsletter, published December 2022.

Phase Three has commenced (February 2023) and to date has involved online and face-to-face information sessions. Cleanaway will continue to engage with the community during Phases Three and Four.

Has a program for future consultation been developed?

☐ NYD ☐ No ☒ Yes If yes, briefly describe.

Consultation Phases Three and Four will focus on building community understanding of the Proposal and providing multiple opportunities for community members to get involved. This will help strengthen the relationship between Cleanaway and the local community, to further gain support for the Proposal.

Phase Three engagement (early-2023) will involve:

- Targeted stakeholder engagement, including neighbouring residents
- Webpage updates
- Distribution of factsheets (technical study summaries)
- Community surveys
- Community events (meetings, workshops, pop-ups and webinars)
- Social media promotion
- Establishment of a project phone number and email
- Establishment of a Community Reference Group.

Phase Four engagement (mid-2023) will involve:

- Project information updated through the website, social medial and emails to community members (those subscribed for project updates)
- Continuation of the project phone number and email
- Continuation of Community Reference Group meetings.

Authorised person for proponent:

I, James Pearce (full name),

Project Director (position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature _____

Date 13/04/2023

Person who prepared this referral:

I, ……Jenna Beckett……(full name),

……Senior Environmental Consultant……(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature _____

Date 13/04/2023

Appendices List

- Attachment 1: MERC site location
- Attachment 2: MERC site plan
- Attachment 3: MERC local context
- Attachment 4: MERC site photos
- Attachment 5: Planning zones
- Attachment 6: Planning overlays
- Attachment 7: Landscape and Visual Impact Assessment (Arup, 2023)
- Attachment 8: Proposed landscaping
- Attachment 9: Air Quality Assessment (Katestone, 2023)
- Attachment 10: Greenhouse Gas Assessment (Katestone, 2023)
- Attachment 11: Ecology Surveys (EHP, 2023)
- Attachment 12: Noise and Vibration Technical Report (Arup, 2023)
- Attachment 13: Human Health Risk Assessment (enRiskS, 2023)
- Attachment 14: Socioeconomic Impact Assessment (Arup, 2023)
- Attachment 15: Soil Contamination and Baseline Groundwater Investigation (Douglas & Partners, 2023)
- Attachment 16: Hydrology and Flood Risk Technical Report (Arup, 2023)