Decision Report

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Licence Number	W6304/2019/1
Applicant	FTR Operations
ACN	634 958 179
File Number	DER2019/000504
Premises	Nexus Recycling 8 – 10 Winchester Road BIBRA LAKE WA 6163 Legal description - Lot 502 on Deposited Plan 55918 Lot 503 on Deposited Plan 55918
Date of Report	3 April 2020
Status of Report	Final

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1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
Decision Report	refers to this document.
Delegated Officer	an officer under section 20 of the EP Act.
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation.
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of, and during this Review
Licence Holder	FTR Operations Pty Ltd
m^3	cubic metres
Occupier	has the same meaning given to that term under the EP Act.
PM	Particulate Matter
PM_{10}	used to describe particulate matter that is smaller than 10 microns (µm) in diameter
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
Risk Event	As described in *Guidance Statement: Risk Assessment*
$\mu g/m^3$	micrograms per cubic metre
µg/L	micrograms per litre

2. Purpose and scope of assessment

2.1 Application details

On 16 September 2019 FTR Operations Pty Ltd (the Applicant) lodged an application for Category 47 scrap metal recovery activities at 8 – 10 Winchester Road, Bibra Lake for the purposes of constructing a new used lead acid battery (ULAB) reprocessing facility.

The maximum design capacity (assuming the facility was to operate at 100% online time, without stoppages or breakdowns, for 12 hours a day, 6 days a week) is 43 200 tonnes per year. The nominal online time for a ULAB breaking plant is 70%, hence the operational capacity being 30 240 tonnes per year (70% of 43 200). The online time of 70% accounts for the time taken to start machine each morning, to run out product at the end of each working day, planned maintenance stops as well as unplanned downtime. Experience in operating ULAB breaking plants shows 70% online time as typical operation capacity. As such, the estimated throughput of the proposed facility is up to 30 240 tonnes per year. Table 2 lists the prescribed premises categories that have been applied for, and Table 3 lists documentation.

Table 2: Proposed Prescribed Premises Categories

Classification of Premises	Description	Proposed Premises production or design capacity
Category 47	Scrap metal recovery – premises (other than premises within category 45) on which metal scrap is fragmented or melted, including premises on which lead acid batteries are reprocessed	30 240 tonnes per annum

Table 3: Documents and information submitted during the assessment process

Document/information description	Date received
Coterra Environment (2019) Technical Documentation and Environmental Assessment – Volume 1	16 September 2019
Coterra Environment (2019) Technical Documentation and Environmental Assessment – Volume 2	16 September 2019
Coterra Environment various electronic correspondence to update Premises layout design, clarify process controls and commissioning information as provided during the assessment.	11 November 2019 16 December 2019 12 February 2020 17 February 2020 18 February 2020 19 February 2020 21 February 2020 04 March 2020 06 March 2020
City of Cockburn (2020) Notice of determination on application for development approval. Planning and Development Act 2005. Approval to commence development.	01 April 2020

3. Overview of Premises

3.1 Operational aspects

Up to 11 people would be employed at the site. The facility would operate from 6am to 6pm, Monday to Saturday, excluding public holidays. All operations and storage will be contained within the warehouse building, which includes ULABs and all chemicals used in the process.

The site will be connected to the Western Power electricity grid. In addition, a 320 kW backup diesel generator will be installed at the site. The generator will supply power to the stirred slurry tanks (01 and 02) in the event of a power outage. Diesel will be stored onsite in an above ground, self-bunded 2,000L fuel storage tank to fuel the mobile equipment (forklifts and front end loader). Diesel consumption for mobile equipment at peak demand will be approximately 10 L per hour.

It is anticipated that operation of the site will involve 90 truck movements per week to and from the site (i.e. 45 trucks entering and leaving the site per week) to facilitate delivery of materials and removal of recycled products and waste from the site.

If and when general maintenance of the plant and facilities is required, this will be undertaken via the onsite workshop. The maintenance programs are supported by safety standards and maintenance systems and will be compliant with any relevant Dangerous Good regulations.

The processing and operations onsite will generally comprise receipt of automotive batteries which are broken down and recoverable components extracted for recycling and/or re-use. This involves:

- Crushing where batteries are physically broken down.
- Primary separation of battery components which results in separation of metallic lead, lead paste and plastics.
- Secondary separation of plastic battery components and immobilisation of plastic separator waste.
- Production and packaging of recycled products and waste materials, and treatment of generated wastewater.

The facility will comprise the following components or areas:

- Used Lead Acid Battery (ULAB) storage
- Crushing
- Primary screening and filtration
- Secondary screening and gravity separation
- Electrolyte neutralisation
- Separator immobilisation
- Product bagging

3.2 Premises infrastructure and layout

The ULAB processing infrastructure will be fully contained within a warehouse, including the storage area for ULAB upon their arrival at the Premises. Access to the warehouse for delivery of product is via the northern hardstand area through the warehouse roller doors.

The entire warehouse comprises a concrete slab bunded by a curb to prevent any escape of spilled liquids from the facility. A floor drain will be installed in the centre of the warehouse which will collect any spills should this occur. This drain will discharge to the paste slurry tanks so as to reclaim any solids as well as enable treatment of liquors via the waste water treatment system. Treated waste water from the electrolyte neutralisation process will be directed to the Water Corporation sewer.

The Applicant amended the warehouse layout where the internal loop road has been removed. Only forklifts will be used inside the warehouse. No external vehicles will be permitted to enter the warehouse.

A stormwater drainage system will be installed external to the warehouse to direct uncontaminated stormwater off the Premises to the City of Cockburn stormwater system.

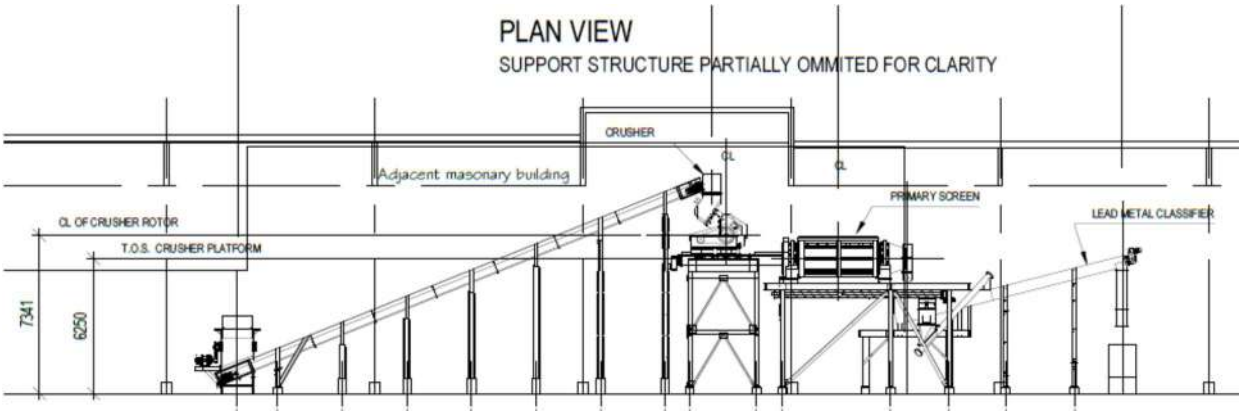

Figure 1: Structural view of the ULAB processing plant

Table 4: Infrastructure

Infrastructure	Design and construction / installation requirements
Used lead acid battery reprocessing plant	Designed and constructed to receive and process up to 30 240 tonnes per annum of used lead acid batteries. Reprocessing equipment to be free of leaks and defects.
Warehouse	Floor to be free of leaks and defects and constructed with concrete with a permeability of ≤1x10^{-9} m/sec. Floor to be enclosed with a concrete bund Floor to contain a drain that collects spills and discharges back into the reprocessing system.
Crusher (hammer mill)	To be fitted with plastic curtains, spray bars and air bags. To be fitted with a mist eliminator that ensures negative pressure during operation and captures, collects and returns acid mist into the reprocessing system. Mist eliminator to be fitted with a fine mesh filter with co-knit glass or teflon fibres, such as the Dupont Towergard mesh pad, or equivalent. Mist eliminator to be fitted with a pressure gauge.
Epoxy liner	To be applied in accordance with the Manufacturer's instructions to meet the chemical resistance level of dilute sulphuric acid. To be installed to sufficient distance to capture potential spillage by jetting. To be installed under the following equipment: • ULAB storage area • Apron feeder • Crusher (hammer mill) & Shredder • Primary & Secondary screens • Lead metal classifying tank • Plastics classifying tank • Recirculation tank, surge tank and elutriator • Slurry tank, clean acid tank, wastewater treatment system area.
Laundry	Waste water from all washing machines is to be plumbed for disposal to the wastewater treatment system

Infrastructure	Design and construction / installation requirements
Stormwater drainage	External to the warehouse, to direct uncontaminated stormwater off the Premises and into the stormwater system

Key finding:

1. The Delegated Officer notes the proposed Premises infrastructure and layout has been designed to meet the best practice requirements of the CEC (2016) and the WHO (2017).

3.3 Product reprocessing activities

3.3.1 Process inputs

FTR Operations will receive pallets of batteries from 3rd party suppliers, businesses that are established in Western Australia and currently supply ULABs to reprocessing facilities on the east coast of Australia. All types of ULAB will be reprocessed at the site, including car, truck, motorcycle, solar and industrial batteries. FTR Operations have a contractual agreement with their suppliers that all ULABs are to be supplied in accordance with the Australian Dangerous Goods Code ADG 7.5 (ABRI Undated) whereby the batteries are undamaged, intact, have not been previously drained of sulphuric acid and are adequately plastic wrapped and strapped for transport.

The 3rd party suppliers will make deliveries of ULABs during designated delivery times, which will be delivered by up to 4 trucks per day. The components of a ULAB are listed in Table 5 with the physical state of the components listed. The lead components are in a solid state and the sulphuric acid is in a liquid state.

Table 5: Components of used lead acid batteries.

Component	Description	State	Weight %
Lead Paste	Paste is the term given to the active ingredient in the battery. In a newly manufactured battery, lead oxide is “pasted” into the metallic lead grid. The charge-discharge of the battery over its life results in the lead oxide/dioxide compound forming lead sulphate ($PbSO_4$) by a non-reversible side reaction with the sulphuric acid (H_2SO_4). The paste in a ULAB is typically 80% $PbSO_4$ with the remainder PbO_2.	Solid	42%
Lead Grid	The grid component is the metallic lead parts of the battery. The grid holds the paste [like chicken wire], the busbar [joins the 6x cells of the battery together] and the battery knobs [what we see on the outside of the battery], which carry the electric charge created by the active material in the battery (the paste).	Solid	29%
Sulphuric acid	The electrolyte is dilute sulphuric acid (H_2SO_4) with a strength of 10% acid and 90% water.	Liquid	20%
Polypropylene	The outer case of the battery is made from polypropylene.	Solid	5%
Separator	The positive and negative plates in the battery are separated by a silica/polyethylene film, termed separator.	Solid	3%

In order to facilitate ULAB reprocessing the following materials will also need to be sourced for the site:

- Water sourced from the Water Corporation reticulated water supply network;
- Lime – Ca(OH)2;
- Magnesium oxide – MgO;
- Phosphoric acid – H_3PO_4; and
- Diesel.

3.3.2 Used lead acid battery storage

ULABs will be stored in the designated storage area within the shrink-wrapped transport packaging, undercover and within the warehouse. A maximum of 250 tonnes of ULAB will be held in the storage area at any time. Normally, storage would be < 100 tonnes ULAB. One pallet can contain up to 60 car-sized batteries.

The designated storage area for ULABs and the floor under all machinery involved in reprocessing, will be coated with an epoxy resin resistant to acid, to prevent deterioration to the floor from spills of sulphuric acid (see section 3.3.10).

Batteries are unlikely to become damaged via dropping or incidental squashing due to the physical strength of the housing unit. Should any ULABs be damaged at the Premises, for example by puncture from the forks of a forklift, FTR Operations has staff trained in the use of the on-site spill kits to contain and collect the spill. Any spilled matter is then disposed of back into the processing system, not into the general waste stream.

Key finding:

2. The Delegated Officer notes the proposed ULAB supply and storage requirements have been designed to meet the best practice requirements of the CEC (2016) and the WHO (2017).

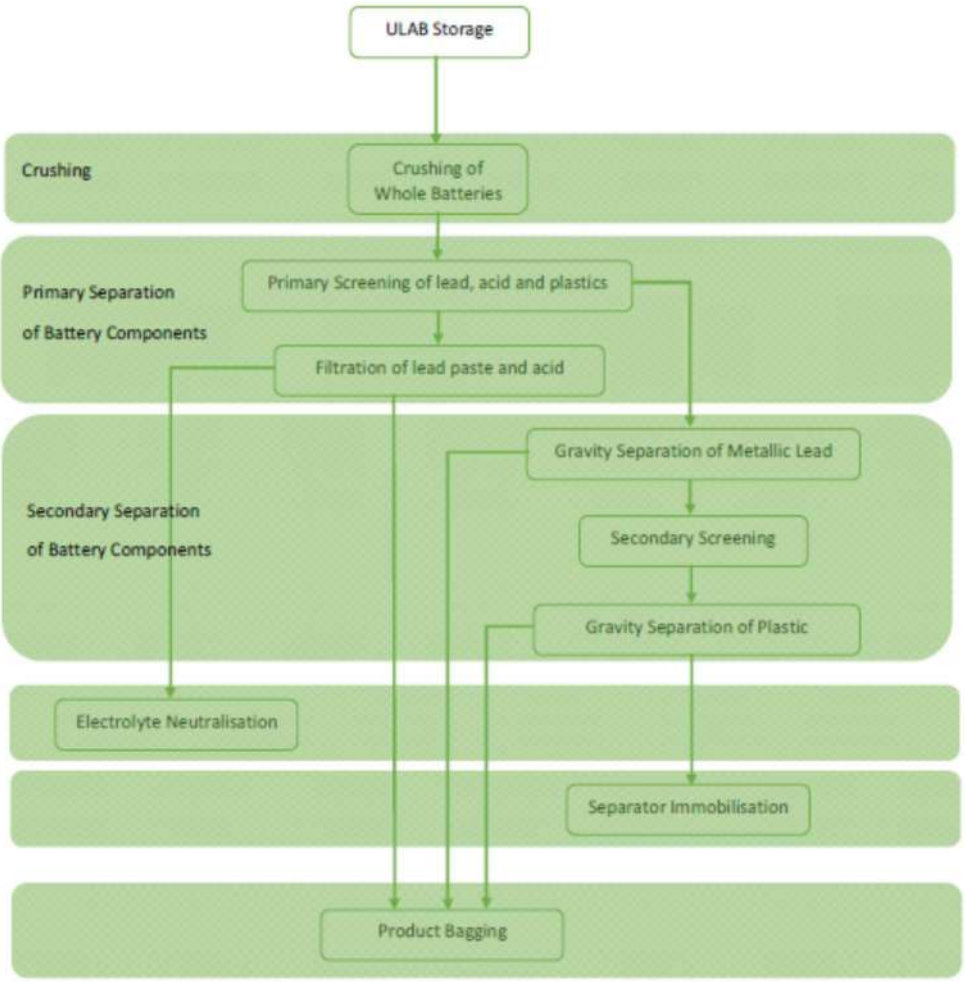

Figure 2: Process flow diagram

3.3.3 Crushing

Pallets of ULAB will be removed from the storage area by a forklift, the shrink-wrap will be removed, and ULABs unloaded into the stainless steel holding container of the apron feeder.

Alternatively, large industrial batteries (>600mm) will be partly crushed via a shredder located adjacent to the apron feeder, to reduce the size of the battery casing enough for the battery to pass through the hammer mill. The shredder does not completely break open the battery and the blades rotate at a very low rotational speed of 10 rotations per minute, which will minimize the contact with acids and prevent splash back of acids and the generation of mists. Output from the shredder reports to the apron feeder and thus follows the same route as other ULABs. There are no vibrations caused by the shredder that could be transferred by ground.

The speed of the apron feeder can be controlled to limit the number of ULABs entering the processing plant at a time. The ULABs exit the apron feeder one at a time and move onto the conveyor belt which transports the ULABs to the top of the hammer mill. Over the inclined conveyor belt is a metal detector to identify foreign ferrous material and enable its removal. At this point the system is all automated, the machinery is all enclosed and the system is fully connected. There is no human transfer of matter between processing points. All wastes and by-products exit the system at specific points where they are contained in collection systems.

After passing through the plastic curtains at the mouth of the feeder, the batteries fall down an “L” angled chute into the hammer mill where the whole ULAB is cut. 1” wide cutting blades

rotate at a speed of 2500 rotations per minute, cutting the battery into pieces less than 80mm. The high rotational speed of the blades can create splash back of sulphuric acid within the hammer mill, however the “L” angled chute presents as the first point of contact for this splash back. The hammer mill is designed to prevent transmission of ground vibrations through the subsurface structure via the installation of air bags between the base of the mill and the ground.

Spray bars are contained within the hammer mill to spray water on the battery when it is cut and to spray water around the internal cavity of the mill, to suppress all air borne sulphuric acid mists and wash off any splashes of lead paste and sulphuric acid. The “L” angled chute and the plastic curtains prevent backward movements of battery particles, back spray of sulphuric acid mists, lead paste and water spray out the mouth of the feeder, and ensure all cut batteries and contaminated water spray is directed down into the mill and through the processing system. The hammer mill is fully enclosed to capture all solids and liquors. The cutting process opens the grid for the lead paste to escape and enables screening and/or density separation to separate the ULAB into its individual components. The crushed battery scrap is then moved by screw conveyor to the primary screen.

The Applicant has amended the original application and added a mist eliminator to the crusher (hammer mill) to obtain a negative pressure. Operating the hammer mill under negative pressure will ensure no fugitive emissions occurs. The pressure gauge is located within the pipeline which will be monitored during operations to ensure negative pressure is maintained.

Air, along with any sulphuric acid mist and dust, will be extracted from the hammer mill enclosure and directed through a mist eliminator. The mist eliminator consists of a vessel in which a mesh pad filter is installed. Air enters below the filter, passes up vertically through the filter and exits at the top of the vessel through an extraction fan and into the warehouse.

Solids and large sulphuric acid droplets will be easily trapped by a mesh filter. Lead paste is not expected to enter the mist eliminator as it is in a solid state, however if it does it will be trapped by the mesh filter. Slow moving, fine mists require a fine mesh filter, such as the Dupont Towergard mesh pad, where co-knit glass or teflon fibres provide larger surface areas to enable surface tension adhesion for the capture of slower and smaller droplets.

The mist, entrained in the air, collides with the filter, coalesces and drains to the base of the vessel. The air passes through the mesh, now mist free, and exits the top of the mist eliminator. Any solids entering the mist eliminator will collect within the mesh pad. Liquor will collect at the base of the vessel and be drained back into the reprocessing system.

Overtime a buildup of sulphuric acid and any solids in the mesh filter will reduce the effectiveness of the extraction. To maintain efficient negative pressure within the hammer mill, the mesh filter will need to be cleaned on a routine basis. An in-built pressure gauge on the inlet will measure the vacuum within the inlet/hammer mill. A pre-determined pressure will trigger an automatic mesh clean, otherwise the automatic mesh clean will be manually activated monthly.

The volume of air extracted would be in the order of $2m^3$ to $4m^3$/hr, enough to maintain a negative pressure within the mill housing. The clean discharged air from the mist eliminator will be vented within the factory building.

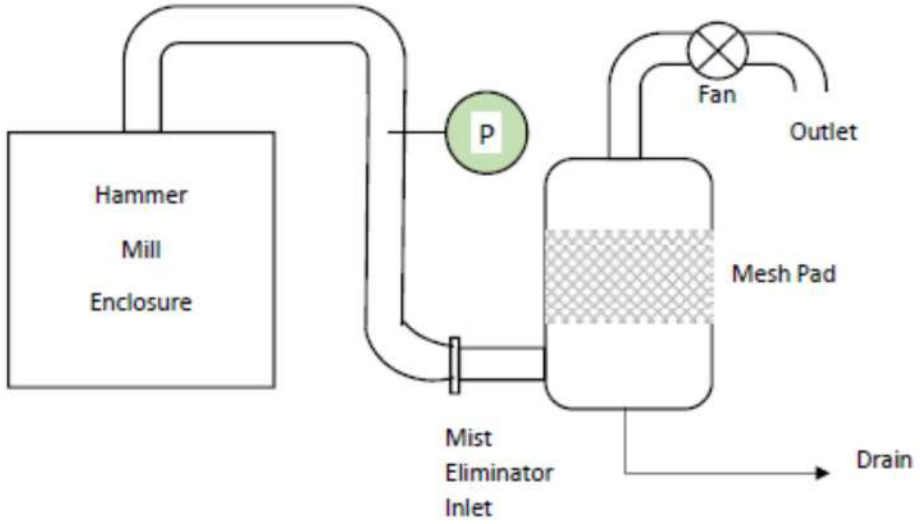

Figure 3: Mist eliminator showing pressure gauge

Key finding:

3. The Delegated Officer notes a stack is not utilised in the reprocessing system, therefore stack emissions to air are not of concern for the scope of the risk assessment.
4. The Delegated Officer notes the Applicant has proposed the use of an automated, enclosed, fully connected reprocessing system operated under negative pressure via a mist eliminator with a mesh filter will reduce the potential for fugitive emissions of solid lead paste, sulphuric acid mist and dust, and has been designed to meet the best practice requirements of the CEC (2016) and the WHO (2017).
5. The Delegated Officer notes the use of air bags will prevent the transfer of vibrations from the mill through the subsurface structure.

3.3.4 Primary screening and filtration

The crushed battery scrap from the hammer mill is moved by screw conveyor to the primary screen. The primary screen separates the material based on size. The undersized material, fine lead paste and electrolyte, pass through the <1mm screen. The oversized material, grids, polypropylene and separators, do not pass through the screen and exit to the metal classifying tank.

The lead paste and electrolyte that pass through the primary screen mesh report to the elutriator. This step is a second pass at collecting the fine lead grids. Any fine lead grids that passed through the primary screen mesh will sink in the elutriator via gravity separation and be passed into the metal classifying tank feed stream.

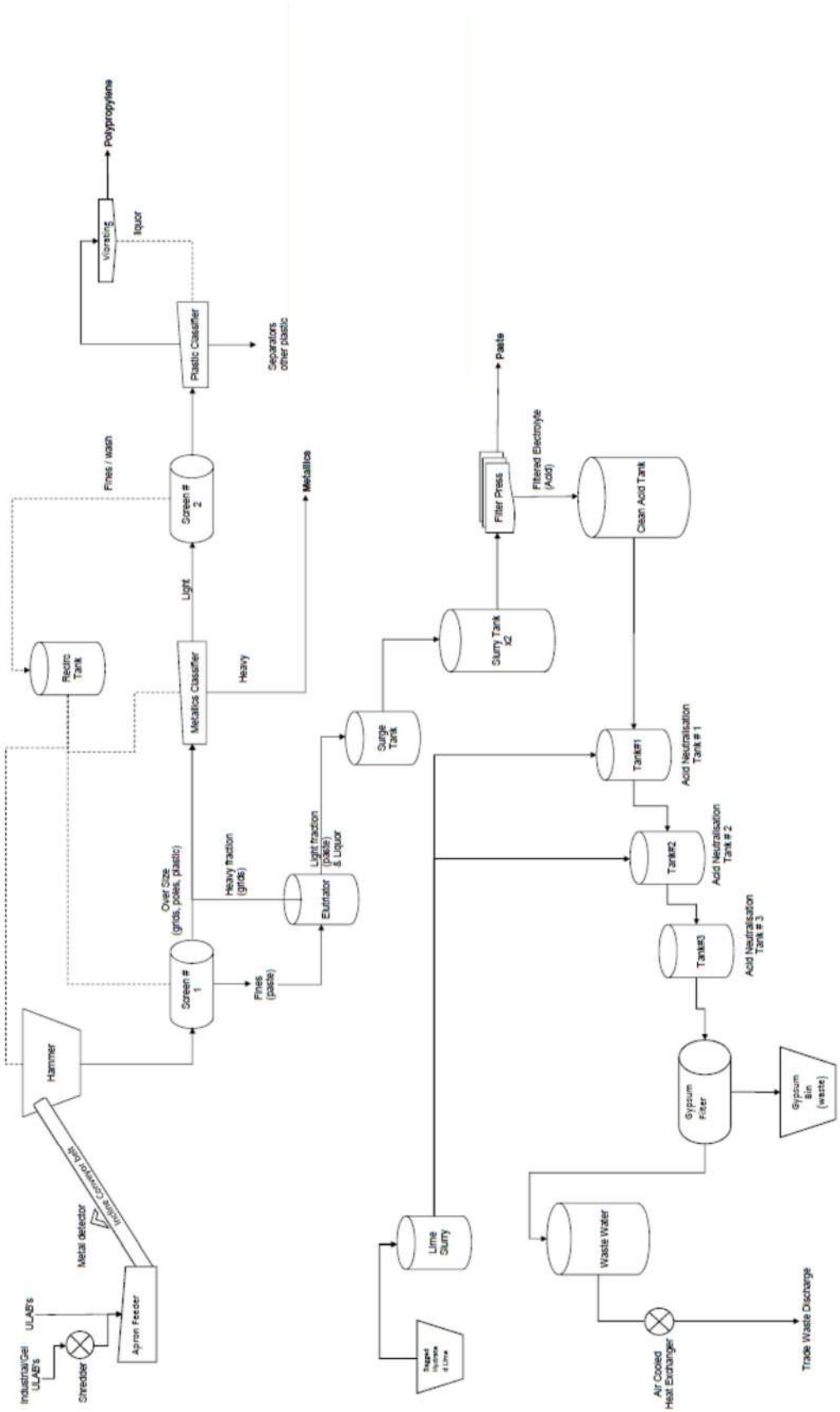

Figure 4: Process flow schematic

The overflow of lead paste and electrolyte from the elutriator pass onto the surge tank. The slurry from the surge tank is pumped to the slurry tank. The slurry tank is a holding or buffer tank to hold the lead paste or electrolyte prior to filtration in one of the two plate and frame filter presses.

The plate and frame filter presses are used to separate the lead paste solids from the electrolyte liquor. The lead paste solids are washed and squeezed inside the press and released as a lead cake. The filtered lead paste is stored in the paste bunker awaiting bagging. The electrolyte filtrate from the press reports to the clean acid tank. The electrolyte is then sent to the water treatment plant for electrolyte neutralisation.

3.3.5 Secondary screening and gravity separation

The oversized material, lead grids, polypropylene and separators that do not pass through and exit the primary screen are sent to the metal classifying tank. The metal classifying tank uses gravity to separate heavy grids and light plastic material. The separation is aided by the use of an upflow liquor stream. The material that sinks is the metallic grids. The grids settle and are transferred from the tank to the grids bunker.

The material that is collected by the upflow liquor reports to the secondary screen. The secondary screen enables a final wash of the polypropylene and separators to collect any residual lead paste and enable the liquor to be recirculated throughout the process. The liquor that passes through the secondary screen mesh reports to the recirculation tank and is used as the liquor feed to the hammer mill, primary screen and metal classifying tank.

The polypropylene and separators that exit the secondary screen report to the plastics classifying tank. Gravity separation is used to separate the polypropylene which floats from the separators which sink. Screw conveyors remove the materials. The polypropylene passes over a vibrating screen to remove residual liquor and the polypropylene is collected in bins. The separators report to the separator immobilisation process.

3.3.6 Electrolyte neutralisation

The electrolyte filtrate from the press that reports to the clean acid tank is then fed to the water treatment plant for electrolyte neutralisation. The liquor has an acid (H_2SO_4) content of approximately 10%. Lime (Ca(OH)2) is used to react with the acid to neutralise the liquor and produce gypsum (CaSO4).

$$H_2SO_4 + Ca(OH)2 = CaSO_4\,(solid) + 2H_2O$$

The filtered electrolyte is added to neutralisation tank 1 with a measured amount of lime. The slurry overflows from tank 1 to tank 2 where additional lime is added. The slurry then overflows to tank 3. This process yields the required residence time to ensure the neutralisation process goes to completion. The slurry from tank 3 is pumped to a drum filter to separate the wastewater from the gypsum. The drum filter releases the gypsum into bins. The gypsum is tested for impurity level, classified and sent to landfill.

The liquor wastewater is collected in a wastewater tank. Prior to discharge the liquor passes through a heat exchanger to ensure temperature is compliant with trade waste discharge limits. The quality of the wastewater will be determined by the potential impurities [i.e lead content (Pb mg/L) and S as SO4 content (mg/L)] as well as pH and temperature (^oC).

In order to discharge the wastewater to sewer a Water Corporation Trade Waste Permit is required.

Cooling is affected by a dry, air-cooled system, negating the need for a water cooling tower.

A portion of the wastewater stream will be utilised as the liquor in the plastics classifying tank.

3.3.7 Separator immobilisation

The separators exiting the Plastics Classifying Tank report to an inclined screw conveyor with hopper. The hopper holds a buffer amount of separators while awaiting immobilisation.

Separators from the hopper are transferred into a mixer with the immobilisation reagents. The process is to immobilise the residual lead content. As the separators are porous and designed to allow flow of electrolyte through them, the separators result in a residual lead content that cannot be washed out. Due to the density difference of lead and the silica/polyethylene separator a small quantity of lead results in a lead content of approximately 3 to 6%. To enable compliant disposal, the lead content needs to be immobilised.

The addition of MgO converts the Pb content to Pb(OH)2, then the addition of phosphoric acid converts the lead hydroxide Pb(OH)2 into lead phosphate Pb3(PO_4)2, which has extremely low leachability. This is a common method used to immobilise lead in soils.

$$MgO + H_2O = Mg(OH)2$$

$$Mg(OH)2 + Pb\ Compounds = Pb(OH)2 + Mg\ compounds$$

$$3Pb(OH)2 + 2H_3PO_4 = Pb3(PO_4)2 + 6H_2O$$

The mixing process is batch wise. The immobilised batches are transferred into the separator bunker, awaiting sampling, analysis and final disposal.

3.3.8 Product bagging

Lead paste and lead grids are to be sold to customers either within Australia or overseas. The products will be loaded into bulka bags of 1 to 2 tonnes. A front-end loader will add material to bags via a dedicated hopper/bag loading system. As the lead material is dense grids or a cake paste no fugitive emissions will occur. All activities are to take place inside the warehouse.

Polypropylene will also be bagged and sold to plastic recyclers.

3.3.9 Ambient temperatures within processing system

The running temperature of the reprocessing system will be ambient air temperature. There is no heating for melting or smelting required, thereby no fumes generated nor odour, and therefore there is no requirement for air extraction systems on the warehouse. The process is fully automated and enclosed within the processing plant equipment, using mechanical cutting to open the batteries and chemical extraction for the lead removal.

Key finding:

6. The Delegated Officer notes the lack of heating throughout the reprocessing system will minimise the generation of fugitive fumes and odour inside the equipment.

3.3.10 Acid resistant flooring

The warehouse floor will be concrete. Although concrete is a porous substance as it contains voids or bubbles, it is relatively impermeable as those voids aren't well connected. The Applicant will ensure concrete used for the warehouse floor has a permeability of $\leq 1x10^{-9}$ m/sec. Concrete is however, susceptible to erosion by acids. ULABs contain lead paste and sulphuric acid.

An epoxy coating will be applied to the concrete flooring in specific areas which is resistant to prolonged contact by dilute sulphuric acid to protect concrete from acid penetration and/or damage.

The areas where the coating will be applied are:

- ULAB storage area
- Underneath battery breaking machine, which includes:
  - Apron feeder
  - Conveyor belt
  - Shredder
  - Hammer Mill
  - Primary & Secondary Screens
  - Lead Metal Classifying Tank
  - Plastics classifying tank
  - Recirculation tank, surge tank and elutriator
    - Inside tank farm/bund area – including the Slurry tank, clean acid tank, and water treatment plant area

Key finding:

7. The Delegated Officer notes the use of an epoxy coating under equipment will ensure any spills of sulphuric acid are adequately contained until they can quickly be cleaned up, which meets the best practice requirements of the CEC (2016) and the WHO (2017).

3.3.11 Maintenance schedule

The hammer mill is maintained on a regular basis. The cutting blades are replaced every 8-10 weeks as needed, the effectiveness of which can be observed daily by the resultant size of the pieces of cut battery.

At the end of every working day the mill is run until all battery particles have visibly exited, then fresh water is run through the entire plant circuit to clean internals of all equipment including spray nozzles, and flush out any small plastics. Up to 27 000 L/hr of water are circulated through the plant. This waste water then passes though the wastewater cleaning system to recover all acids, and the water is subsequently reused in the processing system.

The mist, entrained in the air, collides with the mesh filter, coalesces and drains to the base of the vessel. The air passes through the mesh, now mist free, and exits the top of the mist eliminator. Any solids entering the mist eliminator will collect within the mesh pad. Liquor will collect at the base of the vessel and be drained back into the reprocessing system.

Overtime the mesh filter within the mist eliminator will reduce in effectiveness of extraction of mist and dust. To maintain efficient negative pressure within the hammer mill, the mesh pad will need to be cleaned on a routine basis. An in-built pressure gauge on the inlet will measure the vacuum within the inlet/hammer mill. A pre-determined pressure will trigger an automatic mesh clean, otherwise the automatic mesh clean will be manually activated monthly.

The internal area of the warehouse will be washed daily including all floors and the external of the processing equipment. This wastewater is disposed of into the processing system to remove any potential lead or acid contaminants.

The external areas of the warehouse, being the carpark area, will be vacuumed daily with a road sweeper fitted with a HEPA filter to collect any dust, which will then be disposed of into the reprocessing system to remove any potential lead or acid contaminants.

Key finding:

8. The Delegated Officer notes the daily internal and external cleaning regime meets the best practice requirements of the CEC (2016) and the WHO (2017).

3.3.12 Wastewater treatment system (electrolyte neutralisation)

Approximately 20% of the weight of a battery is liquid, and of that liquid 10% is sulfuric acid (H_2SO_4) and 90% water. The acid needs to be removed from the liquid, so the liquid can be disposed of into the sewer system and the acid is converted to gypsum so it can be disposed of to landfill. This occurs in the wastewater treatment system. Treatment must meet the Water Corporation's acceptance criteria, as per the requirements of the Trade Waste Licence (see section 4.2.3).

The wastewater must be treated to remove the sulfate content (SO_4) and increase the pH, which is called electrolyte neutralisation. Lime ($Ca(OH)_2$) is used to react with the acid (SO_4) to neutralise the liquor and produce gypsum ($CaSO_4$) as follows:

$$\text{Acid } (H_2SO_4) + \text{Lime } (Ca(OH)_2) = \text{Gypsum } (CaSO_4) + \text{Water } (2H_2O)$$

The product of the reaction is gypsum ($CaSO_4$) which precipitates out of the solution as a solid. This enables the gypsum, and thus the SO_4, to be removed from the water by filtration.

This process commences with the wastewater entering Neutralisation Tank 1 and the addition of a controlled amount of lime. The slurry overflows from Tank 1 to Tank 2 where additional lime is added. The slurry then overflows to Tank 3. All three tanks are agitated to promote mixing. The flowrate of the wastewater coupled with tank sizes, yields the required residence time to ensure the neutralisation process goes to completion. The completion of the neutralisation reaction is monitored continuously using pH meters.

The slurry from Tank 3 is pumped to a drum filter to separate the gypsum from the water. The drum filter releases the gypsum into bins. The gypsum is tested for impurity level, classified and sent to landfill.

The water is collected in the Wastewater Tank. Prior to discharge the water passes through a plate heat exchanger to ensure the temperature meets the Water Corporation trade waste acceptance criteria. Parameters of the wastewater to be monitored include lead content (Pb mg/L), S as SO_4 content (mg/L), temperature ($^{\circ}C$) and pH.

Key finding:

9. The Delegated Officer notes the Water Corporation Trade Waste Licence regulates the disposal of treated waste water into the sewage system.
10. The Delegated Officer notes the sewage system connection is part of a closed system and that waste water will be piped to a wastewater treatment system for additional processing, thereby waste water is not considered an emission discharged to the environment from the Premises.

3.3.14 Process outputs

The proposed facility would reprocess up to 30 240 tonnes per year of ULAB. Reprocessed products and waste material will need to be removed from the site. Reprocessed products will generally be packed in bulka bags and sold to Australian and international customers, which include:

- Metallic lead grids;
- Lead paste; and
- Polypropylene.

Waste materials produced from the process are:

- Wastewater discharged at a rate of 34 kL per day which is anticipated to contain the following (values based on a similar facility operated by Australian Refined Alloy in Alexandria NSW):

    - Lead: 0.8 mg/L;
    - Sulphur in SO_4: 370 mg/L; and
    - pH: 7.7;
- Gypsum ($CaSO_4$) – estimated volume of 2 300 tonnes per year; and
- Separators (silica/polyethylene film) – estimated volume of 900 tonnes per year.

Wastewater will be disposed to the Water Corporation sewer system in accordance with the conditions of the Trade Waste licence (section 4.2.3).

General site wastes are also likely to be produced onsite, such as scrap pallets. This is estimated to comprise approximately 30 tonnes per year and will be directed to general waste or recycling bins for offsite disposal. Waste, including gypsum, maintenance workshop waste and office waste will be disposed to landfill via a waste transport contractor.

Table 6 lists the dangerous and non-dangerous goods to be stored at the Premises during the operational phase of the project.

Table 6: Dangerous and non-dangerous good storage.

Substance	State	Storage Design Capacity	Typical Storage Quantity	Comments
Dangerous Goods				
Acid, Sulphuric – ULABs	Liquid	250,000 kg	100,000 kg	Batteries are to be stored in the Battery Bunker area. Batteries will remain in their individual casing prior to entering the process. Batteries are stored in plastic wrapped pallets, with a maximum of 60 batteries per pallet.
Acid – Sulphuric – spent electrolyte	Liquid	60,000 kg	30,000 kg	Sulphuric acid is collected 2x paste slurry tanks and in the Clean Acid Tank. The capacity of each tank is 20,000L.
Acid – phosphoric	Liquid	2,000 kg	1,000 kg	Phosphoric acid is received in 1,000 L IBCs.
Diesel – automotive fuel	Liquid	2,000 L	1,000 L	Diesel is stored in a self-bunding designated tank. The capacity of the tank is 2,000 L.
Non-Dangerous Goods				
Lime, Hydrated	Powder	30,000 kg	10,000 kg	Hydrated lime is received in 1000 kg bags and stored in water treatment system area.
Lime slurry	Slurry	15,000 kg	10,000 kg	Lime slurry is prepared onsite from hydrated lime powder and for electrolyte neutralisation. Lime slurry is held in the 15,000L lime slurry tank in water treatment system area.
Magnesium oxide	Powder	8,000 kg	4,000 kg	Magnesium Oxide is received on site as a powder in 25 kg bags in palletised 1 tonne lots by road transport. The MgO powder must be stored in the original bags in the dedicated area.
Magnesium hydroxide	Slurry	3,000 kg	1,500 kg	Magnesium hydroxide is produced onsite from magnesium oxide powder and water. Magnesium hydroxide is held in the Mg(OH)2 tank in the separator immobilisation area.

Key finding:

11. The Delegated Officer notes the storage and handling of the dangerous goods at the Premises will be regulated by the Department of Mines, Industry Regulation and Safety under the *Dangerous Goods and Safety Act 2004.*

3.3.15 Commissioning

Prior to commencement of operations, the reprocessing plant will be subject to testing to ensure all components are operating as required. This will generally involve:

- Testing equipment motors to ensure each individual unit installed operates in the correct direction and speed;
- Dry testing to ensure linked units operation in sequence as intended;
- Wet testing using water as product to ensure liquor is moved around the process in the intended manner, high level alarms and interlocks function; and
- Full scale testing for initial testing of the plant under operating conditions.

Wet testing is anticipated to take 5 days with no ULAB throughput, and full scale testing is anticipated to take up to 30 days at a reprocessing throughput of 1000 tonnes. Commissioning includes periods where the reprocessing system is shut down for equipment readjustments and recalibration to ensure correct operation.

Key finding:

12. The Delegated Officer notes commissioning of the reprocessing plant is required to ensure the plant is automated, enclosed and fully connected, in order to meet the best practice requirements of the CEC (2016) and the WHO (2017). The Delegated Officer will consider emissions that may be generated during commissioning within the scope of this Works Approval assessment.

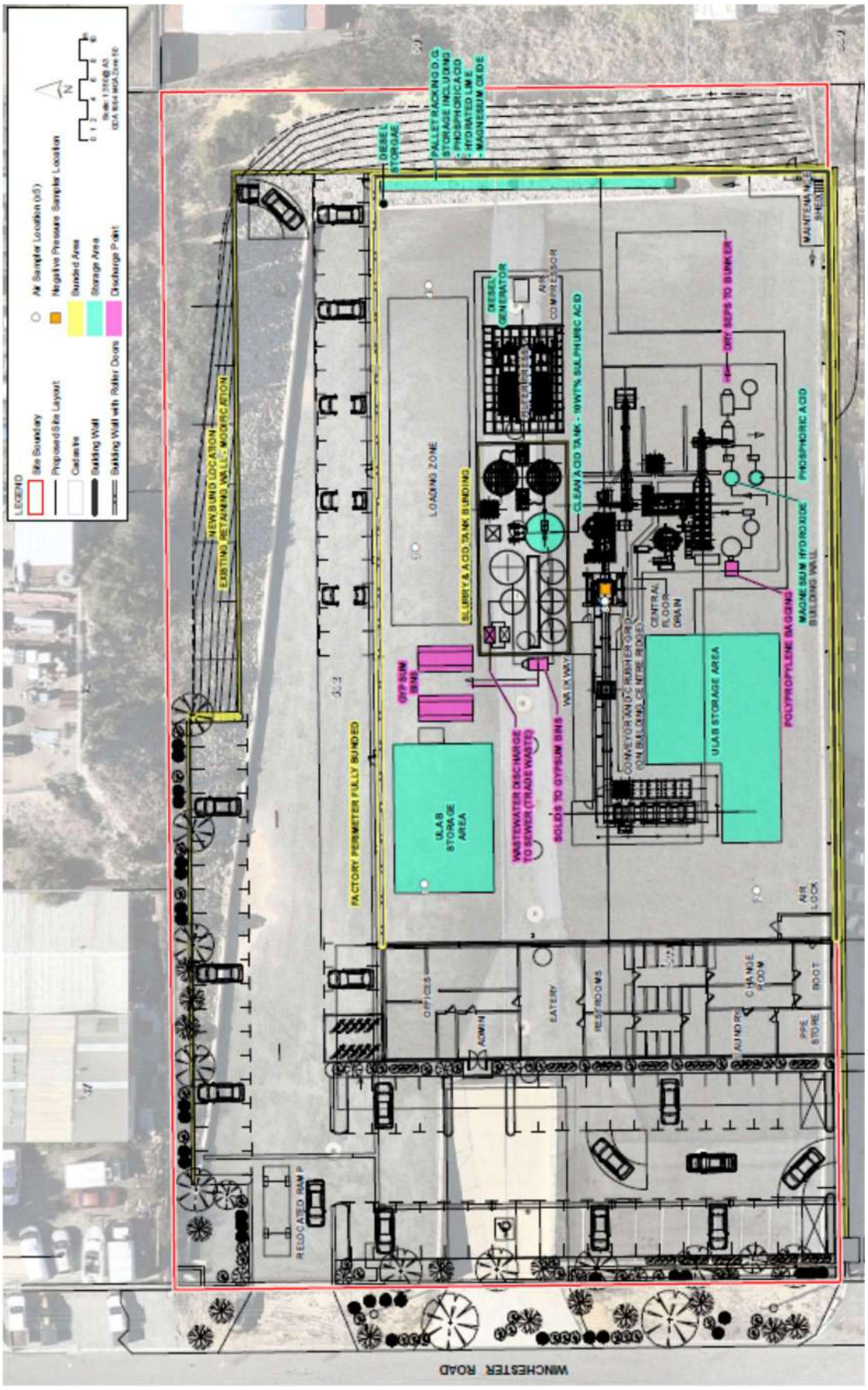

Figure 5: Premises layout plan with commissioning monitoring locations

4. Legislative context

4.1 Part V of the EP Act

4.1.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory principles (July 2015)*
- *Guidance Statement: Setting conditions (October 2015)*
- *Guidance Statement: Publication of Annual Audit Compliance Reports (May 2016)*
- *Guidance Statement: Licence duration (August 2016)*
- *Guidance Statement: Environmental Standards (September 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Risk Assessments (February 2017)*
- *Guideline: Decision Making (June 2019)*
- *Guideline: Industry Regulation Guide to Licensing (June 2019)*
- *Guideline: Odour Emissions (June 2019)*

4.2 Other relevant approvals

4.2.1 Environmental Protection (Controlled Waste) Regulations 2004

The *Environmental Protection (Controlled Waste) Regulations 2004* identify licensing and transportation requirements for controlled waste substances. Substances which are identified as controlled wastes under the regulations include acid solutions or acids in solid form.

Any required Controlled Waste licenses will be obtained from DWER prior to operation of the Premises.

4.2.2 Planning approvals

The proposal requires planning approval from the City of Cockburn. The City advised that under the City's Town Planning Scheme No. 3 the proposed use class is 'General Industry – Licensed' which is a discretionary use in the Industry Zone. The proposal can therefore be considered, subject to planning approval. An application for planning approval has been received and is currently being assessed, including assessment by the Environmental Health unit.

The City of Cockburn granted approval to commence development, subject to conditions, for the proposed development of Industry – General (Licensed) – Battery Recycling Facility on 31 March 2020. The approved proposal is consistent with the proposal subject to the assessment within this Decision Report.

4.2.3 Water Corporation approvals

The premises does not currently connect to the sewer system, therefore the Applicant intends on applying to the Water Corporation to connect to the main sewer network located 150m from the Premises.

Any wastewater discharged from business or industry, other than that which comes from staff amenities or office facilities, is classed as trade waste. The Applicant intends on disposing of treated, non-contaminated wastewater to the sewer network, therefore the Applicant intends on applying to the Water Corporation for a Trade Waste Licence. Parameters of the

wastewater to be monitored prior to disposal to the sewer system, include lead content (Pb mg/L), S as SO4 content (mg/L), temperature (°C) and pH.

4.2.4 Dangerous Goods and Safety Act 2004

The materials which will be stored and handled onsite include the following substances which are classed as Dangerous Goods and regulated under the *Dangerous Goods and Safety Act 2004*:

- Sulphuric Acid
- Phosphoric Acid
- Diesel
- Used Lead Acid Batteries

The required site and driver licenses are issued and managed by the Department of Mines, Industry Regulation and Safety and will be obtained prior to operation of the Premises.

4.2.5 Occupational Safety and Health Act 1984

The Applicant has a requirement under the *Occupational Safety and Health Act 1984* to provide a safe working environment for all employees. The construction of specific aspects within the building provides for workers to safely enter and exit the warehouse environment. An air lock room operates under negative pressure to prevent the transfer of dust contaminants between the warehouse and the administration facilities. Workers will wear personal air quality monitoring devices and the Applicant will install static air quality monitors that both measure airborne dust and lead particles within the warehouse.

Workers will utilise the Dirty Change Rooms to disrobe from personal protective equipment, which remains within the Dirty Change Room or is laundered in the provided laundry next door, and then enter the Clean Change Rooms to don street clothes. This will prevent the transfer of dust contaminants on clothing and shoes, out of the warehouse and into the environment.

Washing machines are fitted with a drain pump filter to capture any potential lead solids in the waste water. This filter will be cleaned regularly and wastes disposed of back into the reprocessing system. Any potential acid washed from clothing will be neutralized by standard washing powders which are slightly alkaline. Waste washing water, after it has been filtered, is plumbed directly into the wastewater treatment system, where it is directed through the wastewater system for disposal.

Key finding:

13. The Delegated Officer notes the use of an automated, enclosed, fully connected reprocessing system will reduce the potential for release of fugitive dust emissions, the use of an air lock room and stringent changing requirements will reduce the potential for transfer of contaminants from inside the warehouse into the environment. The Delegated Officer notes the OSH requirements meet the best practice requirements of the CEC (2016) and the WHO (2017).
14. The Delegated Officer notes these OSH requirements will be regulated under the *Occupational Safety and Health Act 1984*.

5. Modelling and monitoring data

5.1 Monitoring of noise emissions

The allowable assigned levels set out in regulation 8(3) of the *Environmental Protection (Noise) Regulations 1997* apply to noise emissions from the proposed Category 47 scrap metal recovery activities.

The Applicant conducted noise modelling as part of the application for operational activities at the Premises. The Applicant advised the proposed operating hours of the facility will be from 6am to 6pm, Monday to Saturday.

It is noted that the loudest noise source within the warehouse, the crusher (hammer mill), is tonal at the source in the 50 and 100 Hz bands. While the enclosures are concrete the level of attenuation at low frequencies are limited and the absence of tonality at the residential premises to the west is not certain. While it is unlikely to be an issue during the day given the modelled levels emitted and as the residential premises are adjacent to Stock Road which is emitting noise that will cause masking to the crusher noise, the proposal is intending to start at 6am which is during the night period of the *Environmental Protection (Noise) Regulations 1997*. There is the potential that the night time assigned level may be marginally exceeded (~1 dB) for a limited number of residential premises to the west, prior to 7am.

The daytime risk regarding noise impacts to the industrial premises located adjacent to the north, east and south of the premises is minimal.

Modelling indicates that neither the L_{A10} nor the L_{A1} noise sources will exceed the assigned levels at nearby industrial premises. The model assumed that all the doors on the northern façade of the building remain shut when the crusher (hammer mill) is operating. If the roller doors on the northern side of the building were to be open there is a potential that the L_{A10} assigned noise level could be breached at the industry to the north.

The Applicant confirmed that the roller doors on the northern façade of the warehouse will remain closed when the crusher (hammer mill) is in operation. The mill is quick to stop and restart so any need to open the doors does not significantly hinder processing time. In addition the expected deliveries of ULABs, input products and collection of waste products are at anticipated times of day so mill shutdowns and door opening can be accommodated as necessary.

Key finding:

15. The Delegated Officer notes the proposed activities will exceed the allowable assigned noise levels where crusher (hammer mill) activities occur prior to 7am.
16. The Delegated Officer notes the proposed activities will only meet the allowable assigned noise levels if the doors on the northern façade of the building remain shut when the crusher (hammer mill) is operating.
17. The Delegated Officer notes the crusher (hammer mill) will be operated during commissioning activities and normal operations.

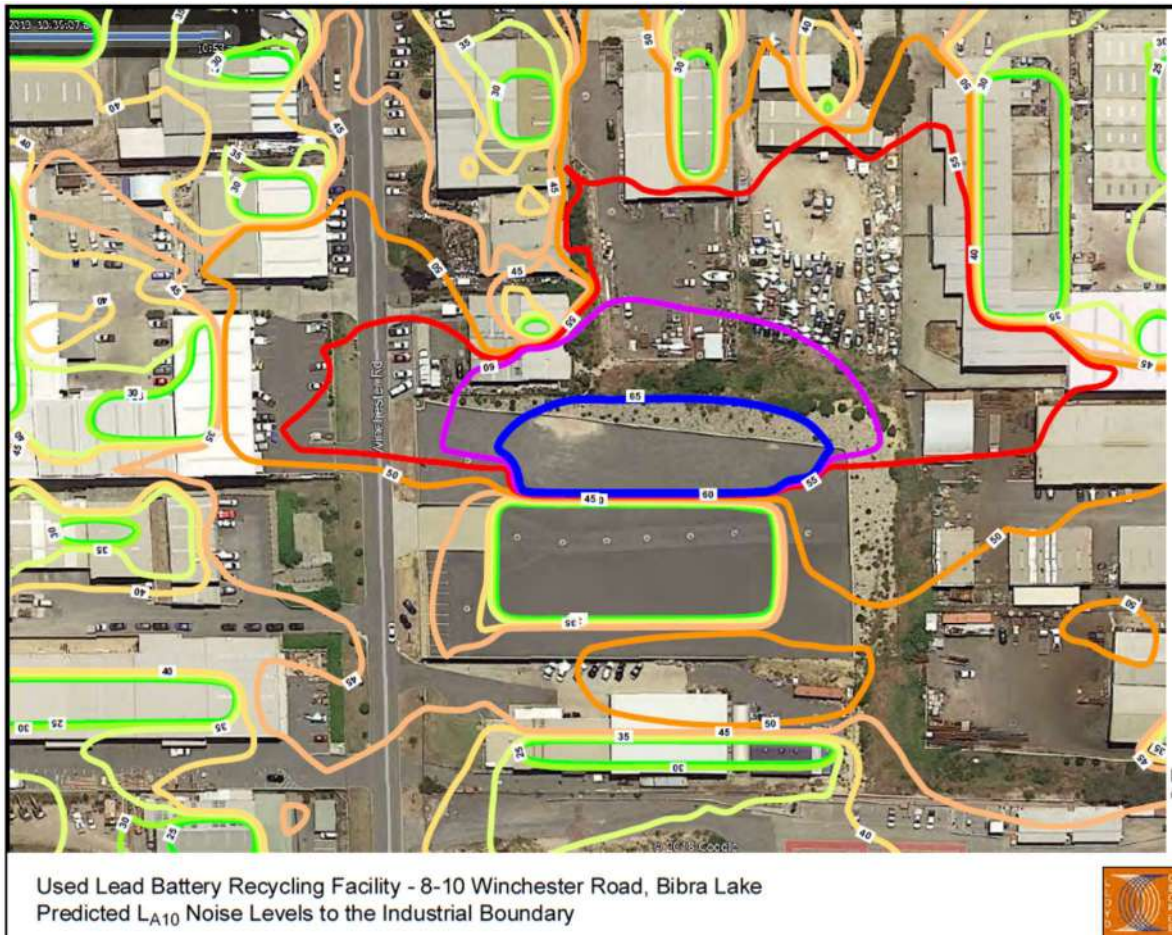

Figure 6: Noise modelling contour map for operations predicted L_{A10} levels

6. Consultation

A letter inviting comment was sent to surrounding industrial premises on 29 October 2019 and the application was advertised in the West Australian on 4 November 2019 for a comment period ending on 29 November 2019. Seven submissions were received, the comments and how they have been considered in this assessment are contained in Appendix 2.

A letter inviting comment was sent to the City of Cockburn on 30 October 2019. The City advised on 18 November 2019 that, under the City's Town Planning Scheme No. 3 the proposed use class is 'General Industry – Licensed' which is a discretionary use in the Industry Zone. The proposal can therefore be considered, subject to planning approval. An application for planning approval has been received and is currently being assessed, including assessment by the Environmental Health unit. The planning application assessment will not be finalised until the works approval has been received.

DWER referred the draft Works Approval and Decision Report to the Applicant on 09 March 2020. The Applicant advised on 10 March 2020 they had no comments on the draft documents and waived the remaining comment period.

7. Potential receptors

7.1 Siting context

The Premises is located at 8 – 10 Winchester Road, Bibra Lake within the City of Cockburn. The area is zoned for industrial purposes which provides for manufacturing industry, the storage and distribution of goods and associated uses, which by the nature of their operations

should be separated from residential areas. The Industrial Zone extends north and east to Spearwood Road and beyond, south to Barrington Street, and west to Stock Road.

The Premises is surrounded by light industrial businesses and associated offices along Winchester Road to the north and south and across Winchester Road to the west, as well as behind the block, to the east on Wellard Street.

Stock Road is 400m west of the Premises, beyond which is the closest residential development. Another residential development is 1000m south, beyond Barrington Street and across the railway lines.

7.2 Residential and sensitive Premises

Table 7 below provides a summary of human receptors, in proximity to the Premises, which have a potential to be impacted from the site activities considered in this Decision Report. The risk assessment in section 9 considers these human and environmental receptors in the context of emissions and potential pathways.

Table 7: Residential receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Industrially zoned offices and workplaces adjacent to the Premises	Immediately adjacent to the side boundaries of the prescribed Premises, along Winchester Road to the north and south and across Winchester Road to the west. Immediately adjacent to the rear boundary of the prescribed Premises, to the east on Wellard Street.
Residential Premises	470m west of the boundary of the prescribed Premises.

7.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. Table 8 below provides a summary of environmental receptors, in proximity to the Premises, which have the potential to be impacted from the site activities considered in this Decision Report. The table has been modified to align with *Guidance Statement: Environmental Siting*.

Table 8: Environmental values

Specified ecosystems	Distance from the Premises
Threatened Fauna	• Priority 4 classified *Isoodon fusciventer* (southern brown bandicoot) located 770m south, 770m east, 810m east and 1180m north of the boundary of the prescribed Premises; • Endangered *Calyptorhynchus latirostris* (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo) located 1010m south west of the boundary of the prescribed Premises; and • Priority 4 classified *Oxyura australis* (blue-billed duck) located 1600m west of the boundary of the prescribed Premises.
Bush Forever	Market Garden Swamps classified as a Special Area, located 1730m west of the boundary of the prescribed Premises.
Threatened Ecological Communities (TEC)	Priority 3 classified Banksia Dominated Woodlands of the Swan Coastal Plain located 300m north, 990m north east, 715m east and 1375m north east of the boundary of the prescribed Premises. These Threatened Ecological Communities are recognised as potential refuge habitat for fauna.
Green Growth Vegetation Complex (GGVC)	• Cottesloe Complex-Central and South, located 335m north, 520m south west, 1700m west and 1035m south of the boundary of the prescribed Premises; and • Karrakatta Complex-Central and South, 335m north, 700m south west and 1400m north west of the boundary of the prescribed Premises. These Green Growth Vegetation Complex communities are recognised as potential refuge habitat for fauna.

8. Potential pathways

Emissions and discharges can follow pathways that lead from the Premises to the receptors mentioned above. Pathways identified within the local area include prevailing winds, rainfall as overland flow or as leachate to groundwater, which have been considered in the risk assessment in section 9. Further detail is provided on some of these pathways below.

8.1 Wind direction and strength

Prevailing wind patterns can provide a direct pathway for transmission of dust and odours by air, so the prevailing wind patterns that may carry these emissions to sensitive receptors have been considered. The closest Bureau of Meteorology (BoM) weather station which records wind frequency data is Perth Airport (BoM site 009021). Prevailing winds are from the east and north east in the mornings, and from the west and south west in the afternoons (Figure 7).

Figure 7: Annual wind rose for 9 am and 3 pm at Perth Airport site 009021.

8.2 Rainfall

Rainfall as stormwater can contribute to emissions where it becomes contaminated after coming into contact with wastes, then exists the Premises via overland flow potentially contaminating receptors in close proximity to the Premises, or exits via leachate to groundwater potentially contaminating groundwater. Rainfall events that may carry these emissions to sensitive receptors have been considered. The closest Bureau of Meteorology (BoM) weather station which records rainfall data is Perth Airport (BoM site 009021). Maximum average rainfall is received in June and July annually. Minimum average rainfall is received in November to March annually (Figure 8).

The Applicant has implemented various construction and control methods to prevent rainfall as stormwater entering the premises and prevent it from becoming contaminated, thereby reducing the risk of impacts from rainfall as stormwater. These controls and the associated residual risk are discussed in section 9.

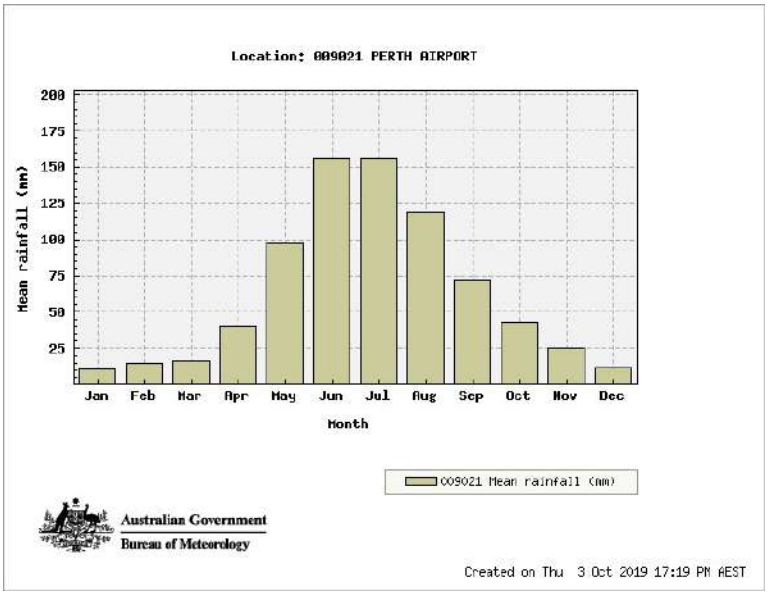

Figure 8: Average annual rainfall (mm) at Perth Airport site 009021

9. Risk assessment

In undertaking its risk assessment, DWER will assess all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 10.

9.1 Risk assessment during construction

The linkage from the source of emissions, via pathways towards receptors to determine Risk Events are set out in Tables 9 and 10 below.

Table 9: Identification of emissions, pathway and receptors during construction

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		**Potential emissions**	**Potential pathway**	**Potential receptors**	**Potential adverse impacts**		
Construction, mobilisation and positioning of infrastructure	Vehicle movements on unsealed access roads Construction of infrastructure	Dust (general)	Air / wind dispersion	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises	Amenity impacts	The Delegated Officer considers the short term nature of construction activities, and the extent of the sealed hardstand area on the Lot, means that adverse impacts associated with dust emissions are unlikely based on Applicant controls. Any emissions of dust causing impacts may be subject to the provisions of section 49 of the EP Act.	No
		Noise				The Delegated Officer considers the short term nature of construction activities and a separation distance of 470m between the nearest residential receptor, will make noise emissions possible, The applicant will undertake construction activities during stated operational times. Any emissions of noise causing impacts may be subject to the provisions of the *Environmental Protection (Noise) Regulations 1997*.	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		**Potential emissions**	**Potential pathway**	**Potential receptors**	**Potential adverse impacts**		
		Spills of hydrocarbons from vehicles and equipment	Direct discharge to land	TEC and GGVC communities located as close as 300m to the Premises	Soil contamination inhibiting vegetation survival and growth	There will be no onsite fuel storage and no onsite refuelling activities during construction. The Delegated Officer does not consider there is a potential emission of hydrocarbons during construction, therefore there is no risk of impact to the TEC and GGVC communities. No further risk assessment is required. Discharges of hydrocarbons and other chemicals may also be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.	No
Commissioning of process equipment	Commissioning of process equipment	Odour from chemicals	Air / wind dispersion	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises	Amenity impacts	The transport of all chemicals arriving at the Premises are regulated by the *Dangerous Goods and Safety Act 2004* and by the *Environmental Protection (Controlled Waste) Regulations 2004*, whereby the packaging of such items are to be adequately sealed to contain odours. After regulation by the above legislation the Delegated Officer considers That there is no pathway for odour emissions to impact amenity. No further risk assessment is required.	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
		Noise	Air / wind dispersion	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises	Amenity impacts	The projected noise modelling conducted on operational activities shows potential exceedance of night time assigned levels for a limited number of residential premises to the west when operations occur prior to 7am, and hat daytime operations require the roller doors to be closed when the crusher (hammer mill) is in operation, to ensure noise emissions will not exceed the assigned levels at neighbouring industrial premises. Since commissioning activities mirror those of operation, the Delegated Officer considers it appropriate to mirror noise controls on the Works Approval during commissioning activities. As such regulatory controls will be applied where prescribed activities will be restricted to occur between 7am and 7pm Monday to Saturday, Applicant controls will be applied where the warehouse roller doors will be required to be closed during crushing (hammer mill) activities. After implementation of these regulatory and Applicant controls the Delegated Officer considers there is no potential pathway for noise emissions at levels that will cause impact. Therefore, the risk of amenity impacts to adjacent and surrounding industrial premises and nearby residential premises is low. No further risk assessment is required. Any emissions of noise causing impacts may be subject to the provisions of the *Environmental Protection (Noise) Regulations 1997*.	

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
		Spills of hazardous chemicals	Direct discharge to land	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises TEC and GGVC communities located as close as 300m to the Premises	Human health Soil contamination inhibiting native vegetation survival and growth and impacting fauna habitat Degradation of surface water and groundwater quality	The transport of all chemicals arriving at the Premises are regulated by the *Dangerous Goods and Safety Act 2004* and by the *Environmental Protection (Controlled Waste) Regulations 2004*, whereby the packaging of such items are to be adequately sealed to prevent spills. Spills may occur by failure to ensure the reprocessing system is enclosed and fully connected prior to commissioning. Should a spill occur, staff will be sufficiently trained in the use of the on-site spill kits to contain and collect the spill, disposing of it back into the processing system. After regulation by the above legislation and implementation of Applicant controls for adequate construction and spill response, the Delegated Officer considers that, under normal operations, there is no pathway for spills to discharge to land. Therefore, the risk of impacts to surrounding industrial premises and nearby residential premises is low. As this risk is mitigated by adequate implementation of these Applicant controls, the Delegated Officer shall enforce these controls via construction and commissioning conditions on the Works Approval. No further risk assessment is required. Discharges of chemicals may also be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.	No

9.2 Risk assessment during operation and commissioning

Table 10: Identification of emissions, pathway and receptors during operation and commissioning

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		**Potential emissions**	**Potential pathway**	**Potential receptors**	**Potential adverse impacts**		
Operation of infrastructure	Operation of infrastructure	Lead	Air / wind dispersion	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises	Amenity impacts	See section 10	Yes
		Noise				Projected noise modelling shows potential exceedance of night time assigned levels for a limited number of residential premises to the west, where operations occur prior to 7am. The Delegated Officer considers it appropriate to manage this matter via regulatory controls on the Licence to limit the operating times of the crusher (hammer mill) from 7am to 7pm, Monday to Saturday consistent with the *Environmental Protection (Noise) Regulations 1997*. Applicant controls to mitigate noise emissions during daytime operations include ensuring the roller doors are closed when the crusher (hammer mill) is in operation, ease of stopping the mill should the doors need to be opened, and scheduling delivery times to accommodate the mill shut down and door opening times. These Applicant controls ensure neither the L_{A10} nor the L_{A1} noise emissions will exceed the assigned levels at neighbouring industrial premises. After implementation of these Applicant controls the Delegated Officer considers noise emissions although a possibility, are unlikely to have a pathway to result in impact. Therefore, the risk of impacts to surrounding industrial premises and nearby residential premises is low.	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
						As this risk is mitigated by adequate implementation of these Applicant controls, the Delegated Officer shall enforce these controls via construction and commissioning conditions on the Works Approval, and via operational conditions on the Licence. No further risk assessment is required. Any emissions of noise causing impacts may be subject to the provisions of the *Environmental Protection (Noise) Regulations 1997*.	
		Odour	Air / wind dispersion	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises	Amenity impacts	The storage and handling of all chemicals at the Premises is regulated by the *Dangerous Goods and Safety Act 2004*, whereby the packaging of such items are to be adequately sealed which will contain odours. The Applicant has selected a reprocessing system that does not require heating, melting or smelting, thereby does not generate fumes so will not generate odours. The Applicant has selected a reprocessing system where all activities are mechanical, automated and will occur within entirely sealed equipment which will contain odours, with the exception of the mouth of the crusher (hammer mill). The Applicant will install plastic curtains and spray bars on the crusher (hammer mill) and will operate the mill under negative pressure via the mist eliminator, which will contain all materials and will ensure no fugitive emissions such as odour. The Delegated Officer notes odours can potentially occur during decanting of chemicals from packaging into process equipment. After regulation by the above legislation the Delegated Officer considers That there is no	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
						pathway for odour emissions to impact amenity. Therefore, the risk of impacts to surrounding industrial premises and nearby residential premises is low. As this risk is mitigated by adequate implementation of these Applicant controls, the Delegated Officer shall enforce these controls via construction and commissioning conditions on the Works Approval, and via operational conditions on the Licence. No further risk assessment is required.	
		Vibrations	Ground	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises	Amenity impacts	The Delegated Officer notes the only source of potential vibrations are from the crusher (hammer mill). Operation of the hammer mill will create vibrations that could be transferred through the subsurface structure, however vibrations are absorbed by air bags located in between the base of the mill and the ground. After implementation of this Applicant control the Delegated Officer considers the potential for vibrations to occur is unlikely, and with a slight consequence to amenity. Therefore, the risk of impacts to surrounding industrial premises and nearby residential premises is low. As this risk is mitigated by adequate implementation of this Applicant control, the Delegated Officer shall enforce this control via construction and commissioning conditions on the Works Approval, and via operational conditions on the Licence. No further risk assessment is required. Ground vibrations may be subject to the provisions of the *Environmental Protection (Noise) Regulations 1997*.	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
		Spills of hazardous chemicals	Direct discharge to land	Industrial offices and workplaces adjacent to the Premises Residential premises located 470m west of the Premises TEC and GGVC communities located as close as 300m to the Premises	Human health Soil contamination inhibiting native vegetation survival and growth and impacting fauna habitat Degradation of surface water and groundwater quality	The storage and handling of all chemicals at the Premises is regulated by the *Dangerous Goods and Safety Act 2004*. This regulates the packaging, the method of storage and which chemicals can and cannot be stored together, to prevent spills, cross contamination and adverse chemical reactions. The Applicant has selected a reprocessing system where all activities are mechanical, automated and will occur within entirely sealed equipment, which will prevent spills of hazardous chemicals, with the exception of the mouth of the crusher (hammer mill). The Applicant will install plastic curtains and spray bars on the crusher (hammer mill) and will operate the mill under negative pressure via the mist eliminator, which will contain all materials and will ensure no spills of hazardous chemicals. The Applicant has a designated storage area for ULABs and the floor under all machinery involved in the reprocessing, will be non-permeable concrete coated with an epoxy resin impervious to acid, to prevent deterioration to the floor from spills of sulphuric acid. The entire warehouse comprises a concrete slab bunded by a curb to prevent any escape of spilled liquids from the facility. A floor drain will be installed in the centre of the warehouse which will collect any spills should this occur. This drain will discharge to the paste slurry tanks so as to reclaim any solids as well as enable treatment of liquors via the waste water treatment system. Should a spill occur, staff will be sufficiently trained in the use of the on-site spill kits to contain and collect the spill, plus the daily internal and external cleaning regime will provide further spill collection, with disposal back into the reprocessing system. After regulation by the above legislation and	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
						implementation of Applicant controls for adequate construction, spill response and daily cleaning, the Delegated Officer considers that there is no pathway for spills to discharge to land. Therefore, the risk of impacts to surrounding industrial premises and nearby residential premises is low. As this risk is mitigated by adequate implementation of these Applicant controls, the Delegated Officer shall enforce these controls via construction and commissioning conditions on the Works Approval and operating conditions on the Licence. No further risk assessment is required. Discharges of chemicals may also be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.	
		Spills of hydrocarbons from vehicles and equipment	Direct discharge to land	TEC and GGVC communities located as close as 300m to the Premises	Soil contamination inhibiting vegetation survival and growth Degradation of surface water and groundwater quality	Diesel is required for the forklifts, front end loader and generator. Diesel storage will be within an above ground, self bunded 2,000 L storage tank. Diesel storage at this quantity is regulated by the *Dangerous Goods and Safety Act 2004*. Should a spill occur, staff will be sufficiently trained in the use of the on-site spill kits to contain and collect the spill, and correct disposal. After regulation by the above legislation and implementation of Applicant controls the Delegated Officer considers that there is no pathway for spills to discharge to land. Therefore, the risk of impacts to surrounding TEC and GGVC communities is low. As this risk is mitigated by adequate implementation of these Applicant controls, the Delegated Officer shall enforce these controls via construction and commissioning conditions on the Works Approval and operating conditions on the Licence.	No

Risk Events						Reasoning	Continue to detailed risk assessment
Sources/Activities		Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
						No further risk assessment is required. Discharges of hydrocarbons may also be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.	
		Contamination of stormwater	Overland flow Leachate to groundwater Discharge to stormwater system	TEC and GGVC communities located as close as 300m to the Premises	Soil contamination inhibiting vegetation survival and growth Degradation of surface water and groundwater quality	The Applicant is concrete lining all external areas of the warehouse which will prevent leachate to groundwater, and will have a stormwater drainage system to direct uncontaminated stormwater away from the warehouse, off the Premises and into the City of Cockburn stormwater system to exclude stormwater from entering the warehouse and therefore from becoming contaminated. The Applicant has selected a reprocessing system where all activities are mechanical, automated and will occur within entirely sealed equipment, and operated within a warehouse. After implementation of these Applicant controls the Delegated Officer considers stormwater will not become contaminated during operation, thereby contaminated stormwater cannot be emitted from the Premises. Therefore, there is no risk of impact to the TEC and GGVC communities. As this risk is mitigated by adequate implementation of these Applicant controls, the Delegated Officer shall enforce these controls via construction and commissioning conditions on the Works Approval and operating conditions on the Licence. No further risk assessment is required. Discharges of hydrocarbons and other chemicals may also be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.	No

9.3 Consequence and likelihood of Risk Events

A risk rating will be determined for Risk Events in accordance with the risk rating matrix set out in Table 11 below.

Table 11: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 12 below.

Table 12: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*

"onsite" means within the Prescribed Premises boundary.

9.4 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 13 below:

Table 13: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

10. Risk Event – lead emissions

Description of lead emissions

Used lead acid batteries from 3rd party suppliers will be received at the Premises for reprocessing. Batteries contain lead paste within the battery casing. During reprocessing, batteries are mechanically cut open in the crusher (hammer mill) and the shredder and the lead removed by specific chemical processes within the automated system. Manually breaking open batteries can release lead particles. Where reprocessing equipment is not designed to be fully enclosed, has leaks and defects, or requires manual handling of product, crushers (hammer mills) and shredders can release lead paste, which can dry on the warehouse floor and release lead dust if disturbed (CEC 2016; WHO 2017).

Lead emissions can also be discharged from damaged batteries, spills, leaks from machinery and washing machine waste water from the laundry.

An air stack is not utilised in the reprocessing system, therefore stack emissions to air outside of the warehouse enclosure are not of concern.

Description of pathway for transmission

For the lead emission to be transmitted to receptors, either human or the environment, the lead must be emitted outside of the machinery and outside of the warehouse. In addition, it must be transmitted by a pathway, via human contact for example on shoes or clothing, via mechanical contact for example on the wheels of vehicles, or via environmental influences such as prevailing wind conditions (section 8.1) or flow of liquid.

Description of potential adverse impact from the emission

For lead to impact upon the health of a human, the body must be exposed to lead. The main routes of exposure and absorption of lead are inhalation, ingestion and, to a much lesser extent, dermal contact. The absorption of lead is greater in people with dietary deficiencies of iron or calcium. Once absorbed, lead is distributed to most organs of the body, including the central nervous system, liver and kidneys, but the largest proportion (up to 90% in adults) is stored in bone (WHO 2017).

Lead has an affinity for sulfhydryl groups and other organic ligands in proteins and can mimic other biologically essential metals, such as zinc, iron and in particular calcium. This enables lead to disrupt enzyme systems dependent on these ions. The toxic effects of lead are wide-ranging and affect almost all body systems including the gastrointestinal system, the endocrine system, the reproductive system and pregnancy, and can cause neurological, cardiovascular and renal effects (WHO 2017).

Applicant controls

The applicant has implemented various construction requirements, operating procedures and controls to prevent emissions and accidental spillage of lead and prevent the transfer of any potential lead dust outside of the warehouse. These include:

- Batteries will only be sourced from established 3rd party suppliers, with contractual agreements that all ULABs are to be supplied undamaged, intact, have not been previously drained of sulphuric acid and are adequately shrink-wrapped and strapped for transport. This will ensure no leakage of lead paste during transport and on arrival at the Premises and when stored within the warehouse.
- ULABs will be stored in the designated storage area within the shrink-wrapped packaging, undercover and within the warehouse. This will ensure protection from the environment such as rain and heat, and ensure no leakage of lead paste during storage within the warehouse.
- The reprocessing plant is all mechanised, automated and will occur within entirely sealed equipment, with the exception of the mouth of the crusher (hammer mill). This will ensure reprocessing activities are contained to certain parts of the warehouse, and that no lead mist is emitted inside the warehouse.
- The mouth of the crusher (hammer mill) is fitted with plastic curtains, spray bars and operated under negative pressure via the mist eliminator. This will ensure no lead solids are emitted outside of the machinery.
- The mesh filter within the mist eliminator will be cleaned on a routine basis via either automatic cleaning or manual activation of the cleaning on a monthly basis. This will ensure no lead solids are emitted outside of the machinery.
- The shredder is operated at low rotational speed of 10 rotations per minute, which will minimise the contact with sulphuric acid and prevent splash back of sulphuric acid and the generation of mists.
- Should a battery be damaged or a leak occur from machinery, staff will be sufficiently trained in the use of the on-site spill kits to ensure any spills are contained and collected quickly, and the collected spill disposing of back into the processing system.
- Water from the mist eliminator, waste wash water from the laundry and collected spills will be disposed of back into the reprocessing system. This will ensure no lead is emitted to the Water Corporation sewerage system.
- The entire warehouse comprises a concrete slab bunded by a curb. This will prevent any spills and daily wash water being discharged from the warehouse.

- A floor drain will be installed in the centre of the warehouse which will collect any spills. This drain will discharge to the paste slurry tanks so as to reclaim any solids as well as enable treatment of liquors via the waste water treatment system. This will ensure no lead is emitted to the Water Corporation sewerage system.
- The designated storage area for ULABs and the floor under all machinery involved in the reprocessing, will be non-permeable concrete coated with an epoxy resin impervious to sulphuric acid. This will ensure sulphuric acid does not erode the warehouse floor and will prevent subsurface seepage of lead.
- The internal area of the warehouse will be washed daily including all floors and the external of the processing equipment. This wastewater is disposed of into the reprocessing system. This will ensure that, should any spill of lead paste go unnoticed, the warehouse is adequately cleaned to collect any lead paste and return it to the reprocessing system.
- The external areas of the warehouse, being the carpark area, will be vacuumed daily with a road sweeper fitted with a HEPA filter, which will then be disposed of into the reprocessing system. This will ensure that, should any spill of lead paste go unnoticed, the warehouse is adequately cleaned to collect any lead dust and return it to the reprocessing system.
- An air lock room operates under negative pressure between the warehouse and the administration facilities as part of OSH requirements for onsite worker safety. This will prevent the movement of lead dust between the warehouse and the administration facilities, and therefore will control the potential for fugitive emissions outside of the building.
- Workers will utilise the Dirty Change Rooms to disrobe from personal protective equipment, which remains within the Dirty Change Room or is laundered in the provided laundry next door, and then enter the Clean Change Rooms to don street clothes. This will prevent the transfer of dust contaminants on clothing and shoes, out of the warehouse and into the environment.
- Workers will wear personal air quality monitoring devices and the Applicant will install static air quality monitors that both measure airborne dust and will detect the presence of any lead particles within the warehouse in accordance with OSH requirements.
- Washing machines are fitted with a drain pump filter to capture any potential lead solids in the waste water. This filter will be cleaned regularly and wastes disposed of back into the reprocessing system. Any potential acid washed from clothing will be neutralised by standard washing powders which are slightly alkaline. Waste washing water, after it has been filtered, is plumbed directly into the wastewater treatment system, where it is directed through the wastewater system for disposal.

Key findings

The Delegated Officer has reviewed the information regarding lead emissions and has found:

18. The proposed Applicant controls will ensure there is a low risk of lead emissions during reprocessing activities, and such controls meet the best practice requirements of the CEC (2016) and the WHO (2017) (see section 11).
19. The Delegated Officer notes the overall risk of lead emissions during operation of the reprocessing plant is directly related to the effectiveness of the Applicant controls put into place during construction.
20. The Delegated Officer notes that although lead is listed in the Workplace Exposure Standards for Airborne Contaminants (Safe Work Australia, 2019) it takes the form of lead arsenate, lead chromate, lead dust or lead fumes. Lead at the point in time of

operating the crusher (hammer mill) is in a solid paste form therefore monitoring of lead is not applicable.

21. The highest risk of lead emissions is likely to be during any loading activities, being the manual movement of ULABs via forklift within the warehouse. Although batteries are unlikely to become damaged via dropping or incidental squashing due to the physical strength of the housing unit, damage could occur to the batteries via puncture from loading equipment. As the lead at this point in time is in the form of lead sulphate ($PbSO_4$) or lead oxide (PbO_2) which are both in a solid paste state not a dust state, and it will be located inside the warehouse, it will not be transferred by wind movements outside of the warehouse nor off-site at the time of the spill. It is considered that a spill of this nature is sufficiently manageable by trained staff, sufficiently contained by the processes in place, able to be sufficiently collected prior to the spill becoming dry and therefore dust-borne and sufficiently disposed of back into the reprocessing system.
22. During operation of the reprocessing plant, data collected from air quality monitoring within the warehouse environment in accordance with OSH requirements is considered by DWER as a measurable indicator of the potential for lead to be emitted within the warehouse during normal operational conditions.

Consequence

If lead emissions occur via manual activities, the Delegated Officer has determined that the impact of lead emissions resulting from loading activities on-site will be minimal, and impacts off-site will be minimal. Therefore, the Delegated Officer considers the consequence of lead emissions to be **Slight**.

Likelihood of Risk Event

The Delegated Officer has determined that lead emissions at a level that have to potential to impact human health at the boundary of the premises will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Unlikely**.

Overall rating of lead emissions

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of lead emissions via manual activities is **Low**.

The Delegated Officer notes the overall risk of lead emissions during operation of the reprocessing plant is directly related to the effectiveness of the Applicant controls put into place during construction. Regulatory controls will include those that ensure adequate construction, installation and commissioning of the system in order to require that it function as designed.

To determine effectiveness of the reprocessing system, the Delegated Officer shall apply commissioning conditions on the Works Approval that enable reprocessing of a limited volume of ULAB product in conjunction with performing negative pressure testing and air quality monitoring within the warehouse to determine effective operation of the reprocessing plant.

During commissioning of the reprocessing plant the Delegated Officer shall require air quality monitoring of sulphuric acid in accordance with the Workplace Exposure Standards for Airborne Contaminants (Safe Work Australia, 2019), where detection of sulphuric acid shall be an indicator of failure to adequately construct the reprocessing system. The Delegated Officer will require the reporting of all commissioning monitoring data, and shall consult with the Department of Health on the results of the air quality monitoring to determine the risk to human health of sulphuric acid emissions, and potentially lead emissions, during assessment of the Licence application.

11. Regulatory controls

11.1 Works Approval controls

The assessment has noted in some cases the construction of the Premises will require controls via Works Approval conditions to ensure minimisation of the risk of emissions or discharges. Works Approval conditions are as follows:

- Condition 1 allows construction of the infrastructure as per Table 2 in the Works Approval.
- Condition 2 allows for minor deviations from the proposed construction.
- Condition 3 requires a construction compliance document to be submitted to the CEO, to confirm all infrastructure has been constructed as required by each stage of construction.
- Condition 4 relates to departures from the requirements of condition 1.
- Conditions 5 to 11 relate to environmental commissioning of the reprocessing facility and includes notification of the commencement of commissioning, commissioning period, quantity limits, time limited operations, closure of the warehouse doors during commissioning of the crusher (hammer mill), commissioning monitoring and submission of commissioning reports.
- Conditions 12 to 14 require accurate recording of complaints and record keeping.

11.2 Licence controls

The risk assessment has determined that additional controls will be applied to the Licence following construction of the proposed works in order to manage identified operational risks. These include but are not limited to:

- The maintenance of the pressure gauge and mesh filter in the mist eliminator;
- The maintenance of the air bags under the crusher (hammer mill);
- The maintenance of the epoxy coating underneath specified equipment;
- The internal areas of the warehouse are wet cleaned and external areas vacuumed daily;
- Time limited operations for use of the crusher after 7am;
- Ensuring the doors on the northern façade of the building remain shut when the crusher (hammer mill) is operating;
- Ensuring the washing machine filters are adequately maintained; and
- Ensuring adequate spill management practices occur.

12. Determination of Works Approval conditions

The conditions in the issued Works Approval in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

Table 14 provides a summary of the conditions to be applied to this Works Approval.

Table 14: Summary of conditions to be applied

Condition Ref	Grounds
Infrastructure and Equipment 1 – 4	These conditions are valid, risk-based and enable flexibility in operations.
Commissioning 5 – 11	These conditions are valid, risk-based and consistent with the EP Act.
Record keeping 12 – 14	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the works approval under the EP Act.

13. Applicant's comments

The Applicant was provided with the draft Decision Report and draft issued Works Approval on 09 March 2020. The Applicant advised on 10 March 2020 they had no comments on the draft documents and waived the remaining comment period.

14. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Issued Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Tracey Hassell
A/MANAGER WASTE INDUSTRIES
REGULATORY SERVICES
Delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
2.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
3.	DER, May 2016. *Guidance Statement: Publication of Annual Audit Compliance Reports.* Department of Environment Regulation, Perth.	DER 2016a	
4.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	DER 2016b	
5.	DER, September 2016. *Guidance Statement: Environmental Standards.* Department of Environment Regulation, Perth.	DER 2016c	
6.	DER, November 2016. *Guidance Statement: Environmental Siting.* Department of Environment Regulation, Perth.	DER 2016d	
7.	DER, February 2017. *Guidance Statement: Land Use Planning.* Department of Environment Regulation, Perth.	DER 2017a	
8.	DER, February 2017. *Guidance Statement: Risk Assessments.* Department of Environment Regulation, Perth.	DER 2017b	
9.	DWER, June 2019. *Guideline: Decision Making.* Department of Water and Environmental Regulation, Perth.	DWER 2019a	
10.	DWER, June 2019. *Guideline: Industry Regulation Guide to Licensing.* Department of Water and Environmental Regulation, Perth.	DWER 2019b	
11.	DWER, June 2019. *Guideline: Odour Emissions.* Department of Water and Environmental Regulation, Perth.	DWER 2019c	
12.	World Health Organization (2017) Recycling used lead acid batteries: health considerations. Geneva.	WHO 2017	https://www.who.int/ipcs/publications/ulab/en/
13.	Commission for Environmental Cooperation (2016) Environmentally sound management of spent lead-acid batteries in North America: Technical guidelines.	CEC 2016	http://www3.cec.org/islandora/en/item/2323-practices-and-options-environmentally-sound-management-spent-lead-acid-batteries
14.	Australian Battery Recycling Initiative (undated) Used lead acid battery recycling. Packaging guidelines for used lead acid batteries. ULAB R4	ABRI Undated	https://batteryrecycling.org.au/resources/guideline-for-lorem-ipsum-dolor/

Appendix 2: Summary of submissions

DWER received 6 submissions. DWER has removed any personal identifying references within the submissions, however has maintained the integrity of the concerns of the submitter.

Concern	DWER response
We would like to submit a notice of concern and would like the application denied. There is a car park at the front of the workshop building and customer vehicles (trucks, cars and boats) are parked within our property, in this car park. If batteries are recycled at 8-10 Winchester Rd there will be in effect “acid rain” which will affect the paintwork of our vehicles, customer vehicles and our building. We have previously had damage to vehicles from a local galvanizing business and do not want this to occur again. Processes like the galvanizing or scrap metal recovery from batteries, give off a toxic and caustic waste which will affect surrounding businesses. Such businesses need to have a larger area surrounding their premises, on Winchester Rd the properties are very close and the businesses on both side will be affected.	Acid rain will not be produced by ULAB reprocessing. There are no external emissions via stacks or vents to air from the proposed activities and all liquid and solid wastes are neutralized and packaged in accordance with the *Dangerous Goods Safety Act 2004* prior to being either on-sold as a product or disposed of adequately to landfill. The galvanizing process is a different process and cannot be compared to ULAB reprocessing methodology, which is a closed system process (section 3.3).
1. Firstly I would like to object to the term “recycling facility”. I think this is misleading. Crushing 30,000 tons of lead acid batteries a year using phosphoric acid as an input is a recycling processing plant pure and simple. I make this distinction as while there are other recycling facilities in the area they are nothing like what is proposed here. **2.** Point 10.1 Sensitive land uses. I operate a business adjoining the land in question. My 4 workers are certainly closer than 480m. Point 10.1 states “or other land use which may be affected by an emission or discharge associated with the proposed activities”. I would just like	**1 & 4.** It is likely the wording used in correspondence to the submitter was incorrectly phrased. The *Environmental Protection Regulations 1987* includes Category 47 Scrap metal recovery: premises (other than premises within category 45) on which metal scrap is fragmented or melted, including premises on which lead acid batteries are reprocessed. The Applicant has applied for the correct category as per the legislation. **2 & 7.** This Decision Report has taken into consideration the closest sensitive receptors during assessment of risks posed by emissions and discharges, including those offices and workplaces adjacent to

Concern	DWER response
you to confirm that my business, employees and customers are irrelevant when considering any emissions or discharges from the proposed activities. **3.** Figure 4 Site Layout shows pallet racking outside to store chemicals such as Phosphoric Acid. Storage guidelines for Phosphoric Acid are: *Store in well ventilated area. Keep containers securely sealed and protected against physical damage. Store away from sources of heat or ignition. Keep dry and protect from direct sunlight*. Please advise how storing in outside pallet racks meets these guidelines. **4.** Point 2.5.2 Table 2-1. Am I to assume that recycling of lead acid batteries is treated under the "Scrap metal recycling works" catchall? I would have thought crushing 30,000 tons of lead and sulphuric acid then adding in some phosphoric acid for good measure would be slightly different to usual metal recycling. **5.** Point 4.2.5 regarding noise level requirements: It should be noted that the noise level predictions assume that the roller doors on the north façade of the building remain shut when the plant is operating and compliance can only be achieved under these conditions. What protections do we have that the roller doors are closed at all times the plant is operating? **6.** I cannot find any similar battery recycling plant within the surrounding area nor in fact in WA. As such I would question how this type of business fits in with the surrounding businesses in the area. **7.** I also question how no regard can be given to businesses adjoining the proposed premises as we are not considered "sensitive land users"? **8.** I cannot see how having a lead acid recycling plant adjoining my premises can be anything other than negative for my staff,	the Premises (section 7.2). **3.** Figure 4 Site Layout shows pallet racking inside the warehouse to store chemicals. The Applicant is required to store and handle dangerous goods, including lead acid batteries and phosphoric acid, in accordance with the *Dangerous Goods Safety Act 2004* regulated by the Department of Mines, Industry Regulation and Safety. The Applicant has confirmed the proposed storage and separation distances comply with these requirements. Any spills of phosphoric acid, or any other chemicals at the Premises, are regulated under the *Environmental Protection (Unauthorised Discharges) Regulations 2004*. **5.** Projected noise modelling performed by the Applicant includes the requirement that the roller doors are closed during operation of the crusher (hammer mill). This matter has been considered in section 5.1 of the Risk Assessment with specialist internal DWER advice. As such appropriate conditions will be applied to the Works Approval for commissioning activities and the subsequent Licence upon issue, to ensure the crusher (hammer mill) only operates upon closure of the doors to ensure noise emissions do not exceed allowable levels at neighbouring industrial premises. In addition excessive generation of nuisance noise is regulated under the *Environmental Protection (Noise) Regulations 1997*. **6.** This is the first Category 47 Scrap metal recovery for the purposes of reprocessing lead acid batteries located in WA. It is the prerogative of the Local Government to determine the suitability of the location of industrial activities. The City of Cockburn has advised, under the City's Town Planning Scheme No. 3 the proposed use class is 'General Industry – Licensed' which is a discretionary use in the Industry Zone. The proposal will therefore be considered by the City, subject to planning approval. An application for planning approval has been received and is currently being assessed,

Concern	DWER response
customers and the value of my property.	including assessment by the Environmental Health unit. The application will not be finalised until DWER has made a decision regarding the works approval application. **8.** This Decision Report has assessed the risks posed by emissions and discharges from the prescribed activity within the bounds of the EP Act. Property value is not a matter for consideration by the EP Act.
On the available information my grounds for objection are as follows: **1.** The recycling of lead acid batteries is an inherently toxic process and not suitable or compatible with what is essentially is light industrial area. **2.** There is no safe level of lead exposure and this area is relatively high density both in terms of working population and small blocks. **3.** The operation planned is a relatively large one and should be located in a heavy-industrial area and or in a more isolation situation. **4.** My property has a common boundary with the applicant and any smells, noises or toxic fumes will be blown towards and over it by the south west breezes particularly in summer. **5.** The planned works have the potential to adversely affect people's health in the area both short term and long term and such a risk is not acceptable. **6.** I am not against progress or development but believe this project is not suitable for the area and should be located where the risk to the environment and people is nominal or minimal. **7.** Further I believe that land values in the surrounding area will be	**1, 3 & 6.** It is the prerogative of the Local Government to determine the suitability of the location of industrial activities. The City of Cockburn has advised, under the City's Town Planning Scheme No. 3 the proposed use class is 'General Industry – Licensed' which is a discretionary use in the Industry Zone. The proposal can therefore be considered by the City, subject to planning approval. An application for planning approval has been received and is currently being assessed, including assessment by the Environmental Health unit. The application will not be finalised until DWER has made a decision regarding the works approval application. **2.** DWER does not purport to advocate a level of lead exposure that is safe. Monitoring of emissions of sulphuric acid as an indicator of lead emissions have been considered in section 10. DWER shall consult with the Department of Health on the results of the air quality monitoring to determine the risk to human health of lead emissions, during assessment of the Licence application. The density of the local area is a consideration for the City of Cockburn. **4.** Prevailing wind patterns are a pathway for mobilisation of fugitive emissions (see section 8.1) are considered in the assessment of the risks of odour, noise and lead emissions from the prescribed activity in section 9 and section 10. **5.** The health, welfare, convenience, comfort and amenity of people are considered in the assessment of the risk of the prescribed

Concern	DWER response
significantly impacted by the proposed operation. **8.** In 2016 I was diagnosed with a chronic medical condition that requires ongoing treatment and monitoring, and I am currently managing through regular appointments. The pollution from this plant would be very harmful to me. Please do not let this go ahead.	activity in section 9 and section 10. The Environmental Health unit of the City of Cockburn has also considered the health of the general public during the planning application process. **7.** This Decision Report has assessed the risks posed by emissions and discharges from the prescribed activity within the bounds of the EP Act. The value of property is not a matter for consideration by the EP Act. **8.** DWER has considered the health of workers in adjacent industrial premises, amongst other matters, in the assessment of the risk of the prescribed activity in section 9 and section 10. DWER shall consult with the Department of Health on the results of the air quality monitoring performed during commissioning, to determine the adequacy of construction of the system and the potential for risk to human health of sulphuric acid emissions during assessment of the Licence application. The Environmental Health unit of the City of Cockburn has also considered the health of the general public during the planning application assessment process.
We oppose the proposed development an 8-10 Winchester Road, Bibra Lake. As we have serious concerns about pollution and the environmental impact, the noise factor and any permitting odours due to this proposed development. Our business is in very close proximity and we would be affected by this proposal.	This Decision Report has assessed the risks posed by emissions and discharges from the prescribed activity in section 9 and section 10.
Although we have serious concerns regarding pollution and damage to health and the environment we also have major concerns regarding the increase in traffic that this would generate. Currently we have found that there has been a significant increase in local traffic (rat-runs) along these streets.	This Decision Report has assessed the risks posed by emissions and discharges from the prescribed activity in section 9 and section 10. Traffic management is a matter for consideration by the City of Cockburn.

Concern	DWER response
We therefore strongly oppose this development in that location.	
A submission was lodged on behalf of 35 members of the local community who are opposed to the Development Approval for the proposed operations at 8-10 Winchester Road, Bibra Lake.	This Decision Report has assessed the risks posed by emissions and discharges from the prescribed activity within the bounds of the EP Act. A Works Approval does not give permission for the development to occur at the proposed location. The City of Cockburn has received an application for Development Approval and will assess the suitability of the development at the proposed location, within the bounds of the *Planning and Development Act 2005*. DWER provided a copy of this submission to the City of Cockburn on 5 December 2019, for their consideration.
A submission was lodged on behalf of one submitter from an independent emissions consultant. <u>Noise Emissions</u> Given that the sensitive receptor area (residential - Spearwood) is on the other side of a major road (Stock Rd) and the area in zoned as industrial then the potential for exceedance to the regulations was low. However, due to the very high sources such as crushing and screening equipment within the building, exceedances are predicted if the roller doors are open. Properties most affected include the immediate neighbouring properties. Considerations for control of this. Increased traffic in the form of trucks, especially if they are in a holding pattern outside the building waiting to get in, should be a factor that is considered during the assessment. The period of construction (which is exempt from the WA Noise Regulations criteria as long as adequate Noise Management plan is in place), it is recommended that as per normal practice, a time period for construction and commissioning is set as to not elongate	Noise emissions have been addressed in section 5.1 of this document and adequate controls recommended for inclusion on the Works Approval and Licence to ensure the roller doors are closed when the crusher (hammer mill) is in operation, to ensure compliance with the *Environmental Protection (Noise) Regulations 1997.* Traffic management is a matter for consideration by the City of Cockburn. Once granted, the Works Approval will have a set validity period for construction and commissioning works to occur. Commissioning conditions on the issued Works Approval include controls for management of noise emissions during commissioning of the

Concern	DWER response
disruption to neighbours. Discharge to Air (Fugitive Emissions) No point source emissions are stated in the assessment. All processes are contained within the main building. The electrolyte neutralisation tanks (which hold sulphuric acid and dosed with lime) as well as other tanks which will have chemical reactions taking place, potentially will release vapours. The process of breaking open the batteries to remove constituents using hoppers, screws and screens. This process would potentially release trapped gases or gases released from sub reactions in this process. Is the building under negative pressure to prevent fugitive releases? If so, with all the fugitive sources from tanks, bagging plants, waste water treatment plant as well as diesel trucks and generator – where is this air being emitted from and how will it be monitored and controlled? The truck and forklift movement using a contained internal building road loop system is good for minimising fugitive sources, however is reliant on a couple of factors. The roller door system requires to be automated and not left open (as is the case with a lot of industries, especially in summer months). Trucks and vehicle movements to pick up and drop off >600K tonnes per annum will potentially migrate materials outside the building, which are nuisance at best (dust) and hazardous at worse (lead, lime, magnesium). Given that one of the main concerns is heavy metal contamination which bio accumulates and the plant has requested a lease of 25 years, then this must be reviewed and controlled very seriously.	crusher (hammer mill) (section 9). There is no heating for melting or smelting required, thereby no fumes generated nor odour. All reprocessing activities are mechanical, automated and will occur within entirely sealed equipment which will contain odours, with the exception of the mouth of the crusher (hammer mill). Batteries do not contain gases, rather they contain lead paste solids and liquid sulphuric acid, so gases will not be released during crushing. Gases will not be released from sub reactions as the process is a solids-based chemical reaction system that occurs within a liquid suspension. The crusher (hammer mill) is fitted with plastic curtains, spray bars and operated under negative pressure via the mist eliminator, which will contain all materials and emissions within the processing equipment and will ensure no fugitive emissions such as odour. The Applicant has amended the structural plan for the warehouse layout and no longer proposes an internal loop road. There will be no external vehicles entering the warehouse area, which will minimise the frequency and duration that doors will be need to be open during operations. This Decision Report has assessed the risks posed by emissions and discharges from the prescribed activity in section 9 and section 10. Any contamination of the site over the life of the lease will be regulated under the *Contaminated Sites Act 2003*.

Concern	DWER response
<u>Discharge to Water</u> The building will be placed on a concrete slab to minimise potential fugitive contamination into surrounding water table. Waste water generated from the process, potentially containing lead and sulphur will be discharged to the Water Corporation sewer system (if approved). It is recommended in line with standard practice that periodic monitoring is conducted and monitoring wells located at boundary to confirm that no fugitive release of potentially very harmful liquid migrates from site.	The Water Corporation will manage monitoring of waste water discharged into their sewer system via Trade Waste Licence conditions. The risk assessment of the activities and resultant emissions (section 9) has not identified leachate to groundwater as a concern. It is only standard practice to require monitoring wells where leachate to groundwater is a potential risk. Any spills of chemicals at the Premises are regulated under the *Environmental Protection (Unauthorised Discharges) Regulations 2004*. Any contamination of the site over the life of the lease will be regulated under the *Contaminated Sites Act 2003*.
<u>Discharge to Land</u> The process facility is contained inside a building to minimise impact. Reputable waste licensed companies should mitigate potential unlawful disposal. Spillage by trucks of waste or product to/from facility or windblown fugitive dust from facility to neighbouring properties should be stated and managed in plans.	The Applicant is aware of the need to use licensed Controlled Waste Carriers for the movement of ULAB and other products used at the Premises and waste generated. Spillage by these carriers will be adequately managed by their Controlled Waste licence conditions. Lead emissions, not limited just to dust form, have been addressed in section 10 of this document and adequate controls have been recommended for inclusion on the Works Approval and Licence to ensure compliance with the EP Act.
<u>Traffic and Amenity</u> It is stated (Coterra Vol 1. p26) that the process when running at 100% would require 90 truck movements (45 in/out per week) to	

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deliver materials and remove product/waste. This equates to approximately 8 trucks per day (over 6 days). The estimated facility is proposed to recycle 30,340 tonnes per year. This would then mean that by recycling this tonnage of batteries that the waste and product produced from this would as well as materials required by the process, all of which would need picked up by truck, would potentially double (input/output to 60,680 t/y). Given these large numbers, is it possible that the number of vehicle movements has been underestimated? This should be taken into consideration to the traffic and amenity of surrounding businesses and potential effect on trade. <u>Zoning and Land Use</u> It is acknowledged that the proposed area for the facility is zoned for Industrial land use however the common demographic for the area in actuality is light Industrial, especially given the proximity to residential area (Spearwood) opposite Stock Rd. The imposed change in the nature of the industrial area will potentially have commercial implications related to property value and difficulty finding a new tenant to take over the property given the potential effect in having a process which would lessen the appeal/cause concern for certain applications (food preparation etc).	The number of truck movements onto and off the Premises has been considered in the Noise assessment in section 5.1, the figures for which were provided by the Applicant. Traffic management is a matter for consideration by the City of Cockburn. Zoning is a matter for consideration by the City of Cockburn. Property value is not a matter for consideration by the EP Act.

Attachment 1: Issued Works Approval W6304/2019/1