

Construction Phase Waste Management Plan

Solar PV Export System at,
9438 Mitchell Highway, Cathundral, NSW

Prepared for: Green Gold Energy

Prepared by: PM – Low Impact Development Consulting

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e: info@lidconsulting.com.au
p: 03 9016 9486
a: Level 6, 114 Flinders St, Melbourne 3000
w: www.lidconsulting.com.au



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About LID

Established in 2009 Low Impact Development (LID) Consulting are a leading built environment specialist sustainability and waste consultancy. We assess and make bespoke recommendations for your development to meet compliance or go beyond.

We generally quote within 48 hours, communicate with to you to understand your key focus areas, and offer practical solutions.

Key service offerings include:

- **Town Planning / DA submission stage** – Sustainability Management Plans and implementation reports, Waste Management Plans, Daylight modelling, Solar PV panel assessments, Green Travel Plans, Designing out Crime – Crime prevention Through Environmental Design (CPTED), Construction Management Plans
- **Building permit / CA stage** - Energy efficiency assessments for commercial developments - Section J DTS or JV3 modelling
- **Other frameworks** – Embodied carbon and Life Cycle Assessments (LCAs)

We also deliver industry change by working on improving relevant **policy, industry frameworks or tools**. These include the Merri-bek Council PV and EV guidelines technical reports, The MAV Sustainable Subdivision Framework V2, The Melton ESD Design Guidelines, The State Government (DELWP) Beter Apartment Design Standards Daylight review, The Georges River Council (NSW) ESD Calculator, Community change development Walk Bike Blairgowrie.

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The content of this document represents the entirety of work output or recommendations offered by LID Consulting for this particular development. This content supersedes all other verbal discussions undertaken by LID Consulting representatives in relation to this development.

Commercial waste calculations are based on rates provided by government organisations and adopted and used as an industry standard. Bin numbers and spatial requirements have been calculated in accordance with these guidelines. The end user requirements may vary from this depending on the business use, type and operational practice.

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 LID acknowledges and pays respect to the Australian Aboriginal and Torres Strait Islander people, to their ancestors and elders, past, present and emerging, as the traditional custodians of the lands upon which we work and live. We recognise Aboriginal and Torres Strait Islander people's deep cultural and spiritual relationships to the water, land and sea, and their rich contribution to society.

1 Overview

Low Impact Development (LID) Consulting was engaged by Green Gold Energy to assess the proposed development at 9438 Mitchell Highway, Cathundral, NSW 2823 to provide a construction phase Waste Management Plan (as required by Warren Shire Council Statutory Planning).

The details provided in this report are the recommendations for better practice management of construction and construction phase operational waste.

1.1 Introduction

The proposed development is a 4.95MVA PV export system consisting of 11,340 photovoltaic (PV) modules, to be provided by Green Gold Energy. The development is located within the Warren Shire Council LGA.

As Warren Shire Council is a small scale regional LGA with limited waste management capacity, a structured Waste Management Plan (WMP) is required to ensure that all waste generated during construction is appropriately handled, recycled, and disposed of.

This plan has been prepared in response to the Warren Shire Council RFI letter dated 20th December 2024 and in compliance with key NSW regulations,

- NSW Waste and Sustainable Materials Strategy 2041,
- The Waste Avoidance and Resource Recovery Act 2001, and the Contaminated Land Management Act 1997.

1.2 Site and Development Overview

- The site is relatively flat and located along the Mitchell Highway, with the nearest larger towns being Dubbo (approximately 110 km southeast), Nyngan (approximately 90 km northwest), and Warren (approximately 50 km northeast). The surrounding area is predominantly rural, with minimal existing infrastructure including Mitchell Hwy, neighbouring residences with farmlands and farm sheds/barns.

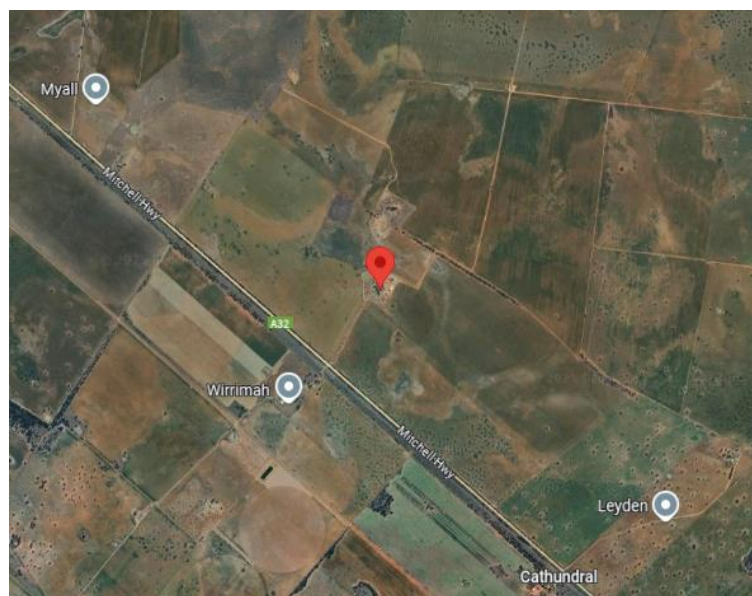


Figure 1-Site Context

- The development will include PV arrays, a High Voltage Switchboard (HVSB), a Battery Energy Storage System (BESS), and an inverter station, typically housed in a 20ft/40ft container.
- Additionally, the development will include internal access roads for construction phase, temporary car parking, site amenities, perimeter security fencing, and concrete footings where necessary for electrical equipment and fencing columns. Internal roads will follow the existing ground terrain, will be constructed to be an all-weather access standard, will be abiding councils' construction specifications/standards, constructed with a 150mm thick PM3/75 quarry rubble layer over stripped natural soil. Mitchell Hwy, neighbouring residences with farmlands and farm sheds/barns.
- Any loose soil from construction will be removed and stockpiled on-site.
- Steel supporting piles for PV arrays will be driven into the ground without the use of concrete, although the final choice of footings is subject to geotechnical investigation.
- The construction phase is expected to last between six to twelve months, with a peak workforce of 30 to 40 workers depending on the development stage.

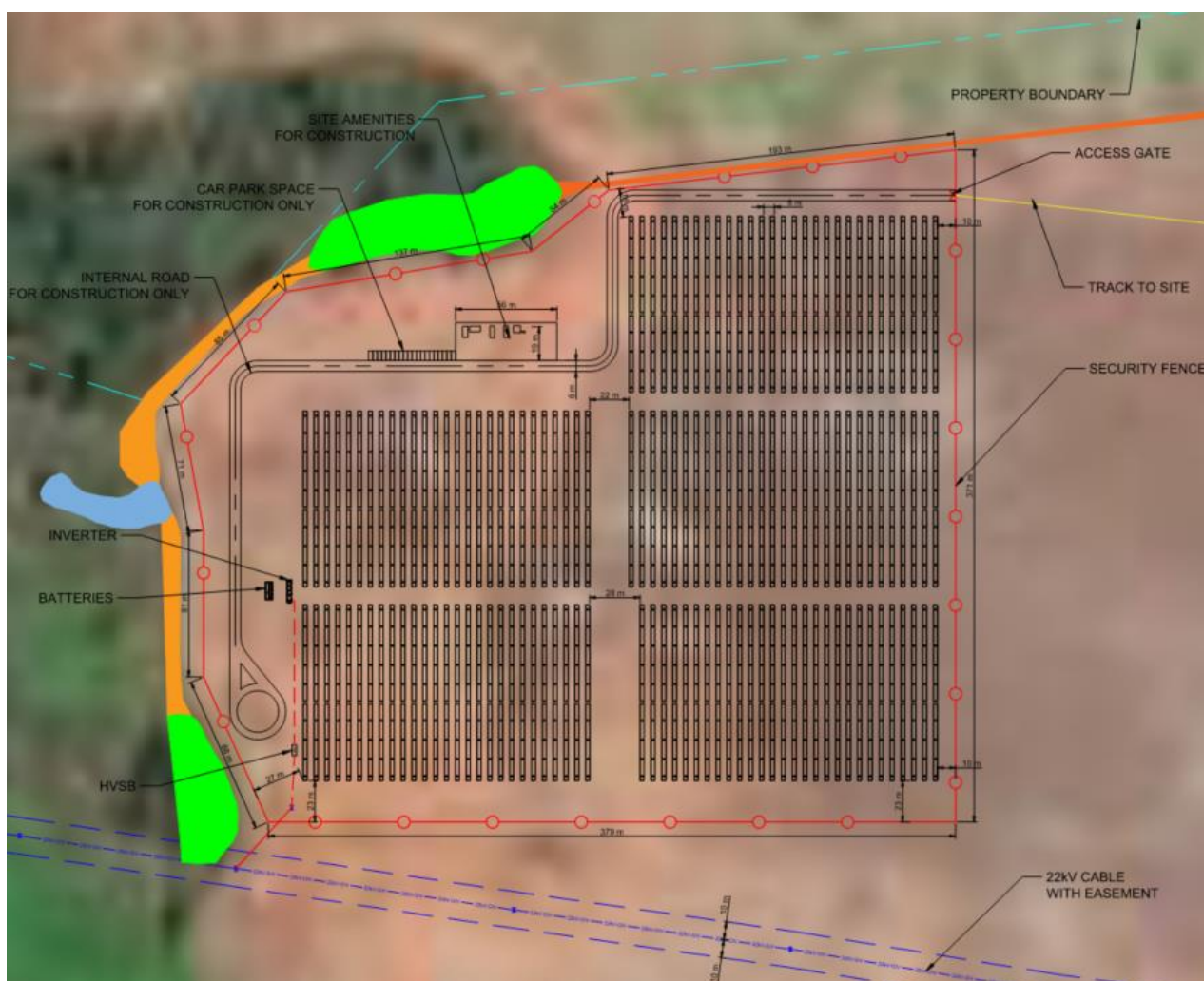


Figure 2-Site plan

2 Construction Phase Waste Management

2.1 Waste strategy, sources and type of waste during construction phase

Waste from internal access road and fencing during construction phase

- **Excavated soil** - Where excavation for roadways and footings is required, the excavated soil will be redistributed across the site rather than taken offsite, this measure avoids the need of storage and removal of soil from the site.
- **Road and fence materials** – the onsite roadways have been confirmed as being made with gravel / aggregate and not bitumen. The following materials will be brought to site but with good ordering there should be minimal excess material. Fence posts will be pre-cut to length before arriving on site. All ordered material will be used on site or returned to the supplier
 - Aggregate for road construction
 - Steel posts for fencing.
 - Wire mesh for fencing.
 - Wire to strengthen tops and bottoms of mesh fencing.
 - Concrete for fence footings
- **Packaging and off-cuts waste** - There will be a small amount of packaging waste with the above materials, and potentially some scrap mesh, wire or fencing offcuts. Packaging waste and scrap materials will be stored onsite within a sealed container, or separate bins with a lockable lid, for removal during the construction period. Bins will be provided for different recyclable items.
- **Contractors' responsibilities** - Appointed contractors will manage the storage and removal of these materials periodically during construction. The contractors is to ensure the materials are recycled in suitable facilities. These materials can also be transferred to the waste transfer stations listed in **section 2.3** below.

Waste from PV systems packaging and installation during construction phase

- **Pre-made and modular installations** - The majority of the PV solar system installation components coming to site are modular and pre-made elsewhere, just being erected on site. This applies to the PV arrays, battery and inverter containers,
- **BESS and inverter** - The BESS and inverter stations will come prefabricated and prepositioned in the shipping containers on site hence no additional packaging waste is expected.
- **PV solar system** - PV components and inverters will produce packaging materials such as:
 - cardboard,
 - polystyrene
 - soft plastic,
 - hard plastics,
 - metal fasteners and

- wooden frames / pallets

These items will all be recycled.

- **Minimising onsite waste storage** - To minimise onsite waste storage, where feasible packaging waste associated with materials delivered to site will be removed by the contractors responsible for delivering or installing the materials, and returned to supplier hubs or recycling facilities. Delivery trucks are to wait and remove large amounts of packaging, or successive delivery trucks are to return the waste to the appropriate Dubbo or Sydney recycling station. In the event that the timing prevents this from occurring packaging waste other than pallets and wooden frames will be stored onsite within a sealed container, or separate bins with a lockable lid, for removal during the construction period. Bins will be provided for different recyclable items: cardboard, and soft and hard plastics. Wooden frames / pallets will be stacked neatly for collection near the other waste streams.
- **PV solar system footings** - The following materials will be brought to site for setting up the PV equipment in place, but with good ordering there should be minimal waste.
 - Concrete for the footings for the BESS and inverter, and potentially PV arrays (note, PV arrays can be supported by steel pile that are driven into the ground by piling machine and no concrete would be used in this method is applied. The final footing choice is subject to geotechnical investigation.

Waste from construction workers

- **Waste types** - Waste generation from workers during the construction phase will primarily include food waste, food packaging and small consumables such as screws, fixings, drill bits etc.
- **Sealed containers** - This waste will be stored onsite within a sealed container, or separate bins for each type of waste with a lockable lids, for removal during the construction period. These materials can also be transferred to the waste transfer stations listed in **section 2.3** below.
- **Toilets** - Portable toilets will be hired for worker amenities, with water supplied from an on-site water tank. No pipework will be installed during construction. The portable toilets will be managed by the suppliers and no waste will be left on site.

Post construction phase waste

- No significant waste is expected during operation after the construction stage as site will be unstaffed. If any waste is produced during routine checks and maintenance visits, the appointed contractors will take their waste back with them while leaving the site.

2.2 Standard Recommendations

- **Good estimating** - The design should involve common construction methods and can be readily estimated with accuracy by experienced contractors for material take-offs. Careful estimation, ordering and prefabrication offsite prior to site construction will ensure that minimal excess material is wasted and that variations on site that result in waste are minimised.
- **Separation of waste streams** - Separation on site is the simplest way to reduce recycling costs as it simplifies sorting of waste at the processing yard. In most cases mixed loads of recyclable and non-recyclable products that requires extensive sorting can incur a significant premium price compared to a site pre-sorted load.

- **Reduced emissions and trips to waste facilities** - Appointed contractors will manage all amenities and waste collections, ensuring materials are transported to appropriate recycling and disposal facilities. Transporting waste in bulk at specific intervals or at the end of the construction phase will reduce the frequency of waste vehicle trips, lowering embodied carbon emissions.
- **Site induction** - All contractors on site should be trained in the contents of this waste management plan as part of site induction procedures, to
 - maximise the use of recycling storage provided on site,
 - maximise the diversion of demolition and construction waste from general landfill, and
 - minimise contamination of the site and surrounds from waste generated onsite.
- **Lunch in lunchrooms** - It will be a requirement of the induction that all food will be consumed within the lunchrooms to ensure food packaging waste is not discarded on site.
- **Small fixings** - No small fixings or similar items are to be discarded onto the ground. Contamination of soil or surrounding spaces, which then needs to be removed off site, often occurs and can be addressed in the following ways,
 - Small items such as discarded fasteners, food scraps packaging and straws – an option will be to *locate small easy to find bins with lids around the site* No polystyrene is to be broken or cut onsite - broken polystyrene – *cut and sweep up immediately then place in bins with lids.*
- **Labelling bins** - All waste containers / skip bins are to be clearly visible, accessible and labelled in a well-lit area to ensure use. Labels are to clearly indicate the correct waste that can be placed in each bin.
- **Hazardous materials** - No hazardous, flammable or explosive materials are to be disposed of within skip bins.
- **Bin locations** - Storage of skip bins is not to cause disturbance to normal stormwater flow.

2.3 Waste Disposal Hubs and details

Material	Treatment	Recycler hubs and notes
Concrete (with reo)	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Concrete (no reo)	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Aggregate	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Metal (clean)	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Metal (galvanised)- eg posts and chain mesh fencing	Recycled	Matthew Metal Management in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Metal (PVC coated chainmesh fencing)	Landfill	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Soft Plastic	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Hard plastic?	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Cardboard	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Polystyrene	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Wooden Pallets	Recycled	Note- Must not contain CCA, HTC, PEC, or LOSP preservatives. Recycled at: Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
General Waste	Landfill	Whylandra Waste and Recycling Facility in Dubbo
Food Organic Waste	Recycled	Whylandra Waste and Recycling Facility in Dubbo
Food Packaging Waste (clean)	Recycled	Whylandra Waste and Recycling Facility in Dubbo, JR Richards in Dubbo, Bingo Industries in Sydney etc.
Food Packaging Waste (with soil)	Landfill	Whylandra Waste and Recycling Facility in Dubbo,

Relevant waste transfer stations and contact details

- Whylandra Waste and Recycling Facility at Cooba Rd, Dubbo, NSW

Phone: (02) 6801 4000 Email: council@dubbo.nsw.gov.au

- JR Richards and sons at 60 Fitzroy St, Dubbo NSW
Phone: [1300 579 278](tel:1300579278)
- Matthews Metal Management at 34 Mountbatten Drive, Dubbo, NSW
Phone: 02 6882 1033
- Bingo Industries recycling centre at 76 Burrows Rd, Alexandria, NSW
Phone: 1300 424 646 Email: enquiries@bingoindustries.com.au

3 Conclusion

- This Waste Management Plan ensures responsible waste handling in compliance with the NSW Waste and Sustainable Materials Strategy 2041 and relevant environmental legislation. By implementing effective waste separation, on-site stockpiling, bulk waste transport, and recycling partnerships, the plan minimizes environmental impact and ensures sustainable waste management practices.
- The structured approach outlined in this report meets Warren Shire Council's requirements and supports responsible development for the proposed solar farm at 9438 Mitchell Highway, Cathundral, NSW, 2823.