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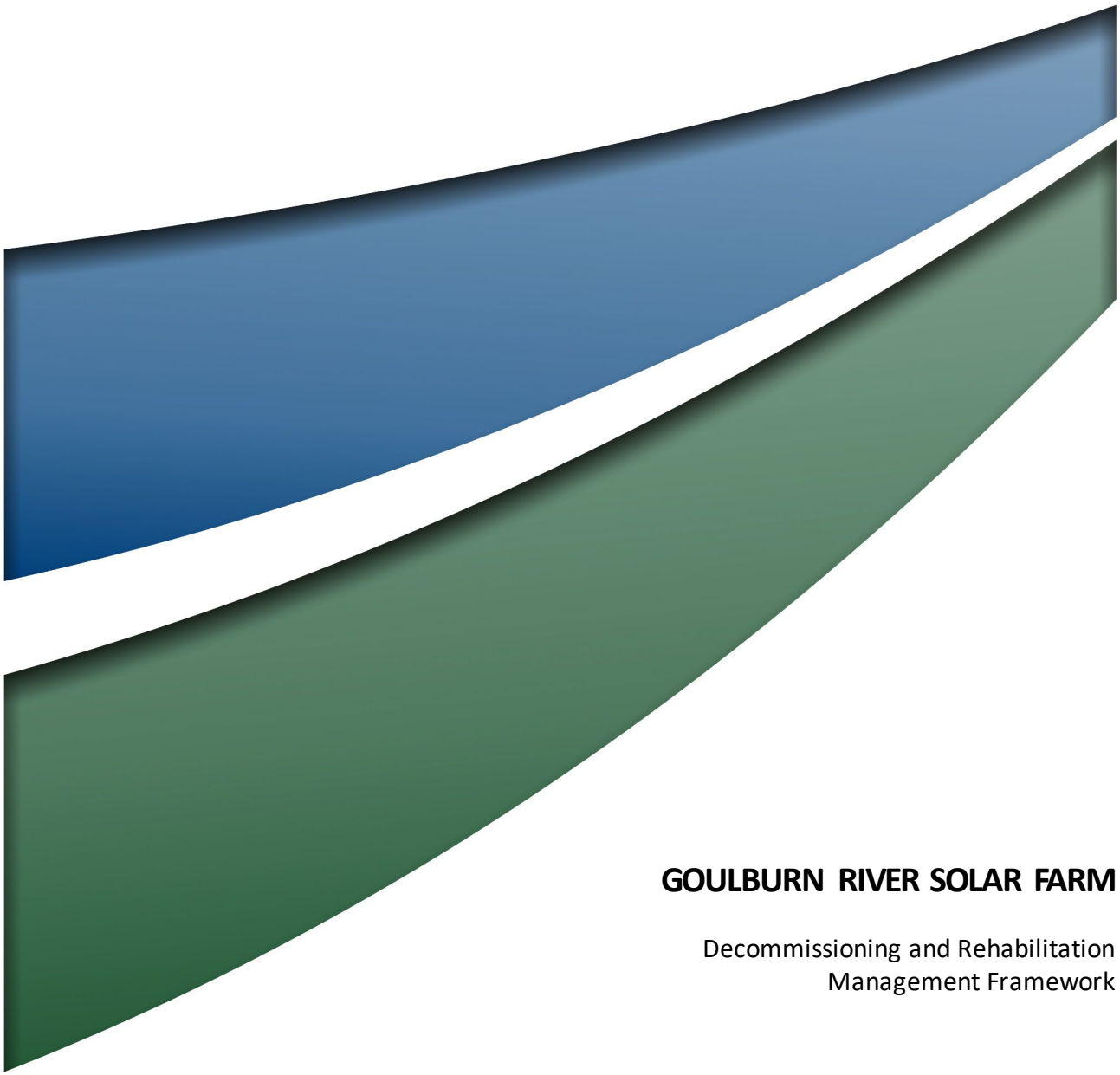

GOULBURN RIVER SOLAR FARM

Decommissioning and Rehabilitation Management Framework

FINAL

April 2023

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Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Lightsource BP

Project Director: Malinda Facey
Project Manager: Jessica Henderson-Wilson
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Environmental & Social Consultants

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V2	Jess Henderson-Wilson	16/11/2022	Malinda Facey	16/11/2022
V3	Jess Henderson-Wilson	13/4/2023	Malinda Facey	13/4/2023

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1.0 Introduction

This Decommissioning and Rehabilitation Management Framework (DRMF) has been prepared by Umwelt for Lightsource bp for the proposed Goulburn River Solar Farm (the Project). The Project is currently seeking development approval under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and, should approval be granted, conditions of consent would be issued relating to this Framework and the decommissioning phase of the Project.

1.1 Purpose

During the construction and operational phases of the Project, Environmental Management Plans (EMPs) will be prepared and implemented in accordance with the EIS and subsequent conditions of consent. Prior to decommissioning, a Decommissioning and Rehabilitation Management Plan will be prepared in accordance with the EIS and conditions of consent, in accordance with the principles of this DMRF.

The DRMF demonstrates a commitment to ensuring appropriate environmental management is undertaken during the decommissioning and rehabilitation phase in accordance with legislative requirements, conditions of consent, stakeholder interests and industry best practice.

The purpose of the DRMF is to provide a guide for the management of the decommissioning and rehabilitation phase of the Project including the identification and assessment of the:

- existing environment and conditions of the site
- statutory context, including regulatory requirements and approvals
- predicted waste streams and appropriate management measures
- rehabilitation goals, objectives and/or performance criteria.

The DRMF is a framework to guide the development of a future Decommissioning and Rehabilitation Environmental Management Plan (DREMP). As such, further work will be required post-approval to reflect the specific conditions or management measures outlined in the conditions of consent, and prior to the end of the operational life of the solar farm to include consideration of circumstances which may have changed during operations including:

- potential future uses of the site
- development and innovation in decommissioning and rehabilitation methodologies and management measures
- development and innovation in waste management measures
- development and innovation in seeding and revegetation techniques
- changes to policy, legislation, and guidelines relevant to the Project
- changes to best practice.

This framework will be implemented by Lightsource bp or the asset owner at the time of decommissioning.

1.2 Overview of the Project

1.2.1 The Proponent

The Proponent for the Project is Lightsource Development Services Australia Pty Ltd (Lightsource bp) (ABN 26 623 301 799). Lightsource bp was formed in 2017 as a partnership between the European solar farm developer Lightsource and global energy company, bp. Lightsource bp is a global leader in the development and management of utility scale solar projects, with a successful track record of progressing projects from early-stage development through to operation and ultimately decommissioning and rehabilitation.

1.2.2 The Project

The Project is located in the Upper Hunter region of New South Wales (NSW), approximately 28 kilometres (km) south-west of the township of Merriwa within the Upper Hunter Local Government Area (LGA).

The Project includes the construction, operation, maintenance and decommissioning of approximately 550-megawatt peak (MWp) of solar photovoltaic (PV) generation with a Battery Energy Storage System (BESS) with 280 MWp and 570-megawatt hour (MWh) capacity. The Project will also include supporting infrastructure, a substation and connection to an existing 500 kilovolt (kV) transmission line.

The Project Area covers approximately 2,000 ha with a Development Footprint of approximately 799.5 ha as shown in **Figure 1.1**.

1.2.3 Decommissioning Stage

The Project is expected to operate for 40 years or more. After the initial 40-year operating period, the solar farm would either be decommissioned, removing all infrastructure and returning the site to its existing pre-solar agricultural land capability, or repurposed/repowered with new PV equipment subject to additional technical feasibility and planning consents.

Should decommissioning be the chosen pathway, at the end of the useful life of the asset, a workforce and additional temporary facilities would be mobilised to enable the removal of equipment and infrastructure. At this time, it is expected that significant movements of light vehicles and trucks for transporting infrastructure off site would occur. The decommissioning phase would be expected to last less than eight months.

During decommissioning, works would include:

- disconnection of electrical components
- removal of solar arrays, including the foundation posts, and sorting and packaging of all materials for removal from the site and subsequent recycling and/or reuse
- removal of all site amenities and equipment not able to be repurposed on site, and recycling and/or reuse of materials wherever practicable
- removal and recycling of electrical cabling
- rehabilitation of areas temporarily disturbed during the decommissioning phase.

The decommissioning works are expected to include excavation and backfilling, waste stockpiling and removal, and rehabilitation and revegetation works.

The following infrastructure is expected to have the potential to remain on-site and be repurposed for use where appropriate, and in agreement with the future landowner:

- substation
- access roads
- site fencing
- landscaping / screening.

It is expected that during the decommissioning stage, a range of wastes would be generated, and these would be managed in accordance with the principles of this DRMF, relevant conditions of consent and a detailed DREMP and/or Waste Management Plan to be developed prior to the commencement of any decommissioning works and based on legislation and requirements at the time.

Following the removal of all infrastructure and materials the site would be returned to its previous conditions in accordance with this DRMF, relevant conditions of consent and a detailed DREMP which would be developed prior to the commencement of any decommissioning works. Further detail is provided in **Section 5.0**.

1.3 Environmental Management

Lightsource bp is committed to developing and implementing an Environmental Management Strategy (EMS) to provide the strategic framework for environmental management for the life of the Project. The EMS would:

- incorporate a Construction Environmental Management Plan (CEMP), Operational Environmental Management Plan (OEMP) and DREMP including all required sub-plans, protocols, management, and mitigation measures outlined in relevant planning and approval documentation
- identify all relevant statutory approvals
- establish roles, responsibilities, authority, and accountability of all key personnel involved in the environmental management of the Project
- establish procedures for consulting with the local community and relevant agencies about the operation and environmental performance of the Project
- establish procedures for handling of complaints, disputes, non-compliances, and emergency response.

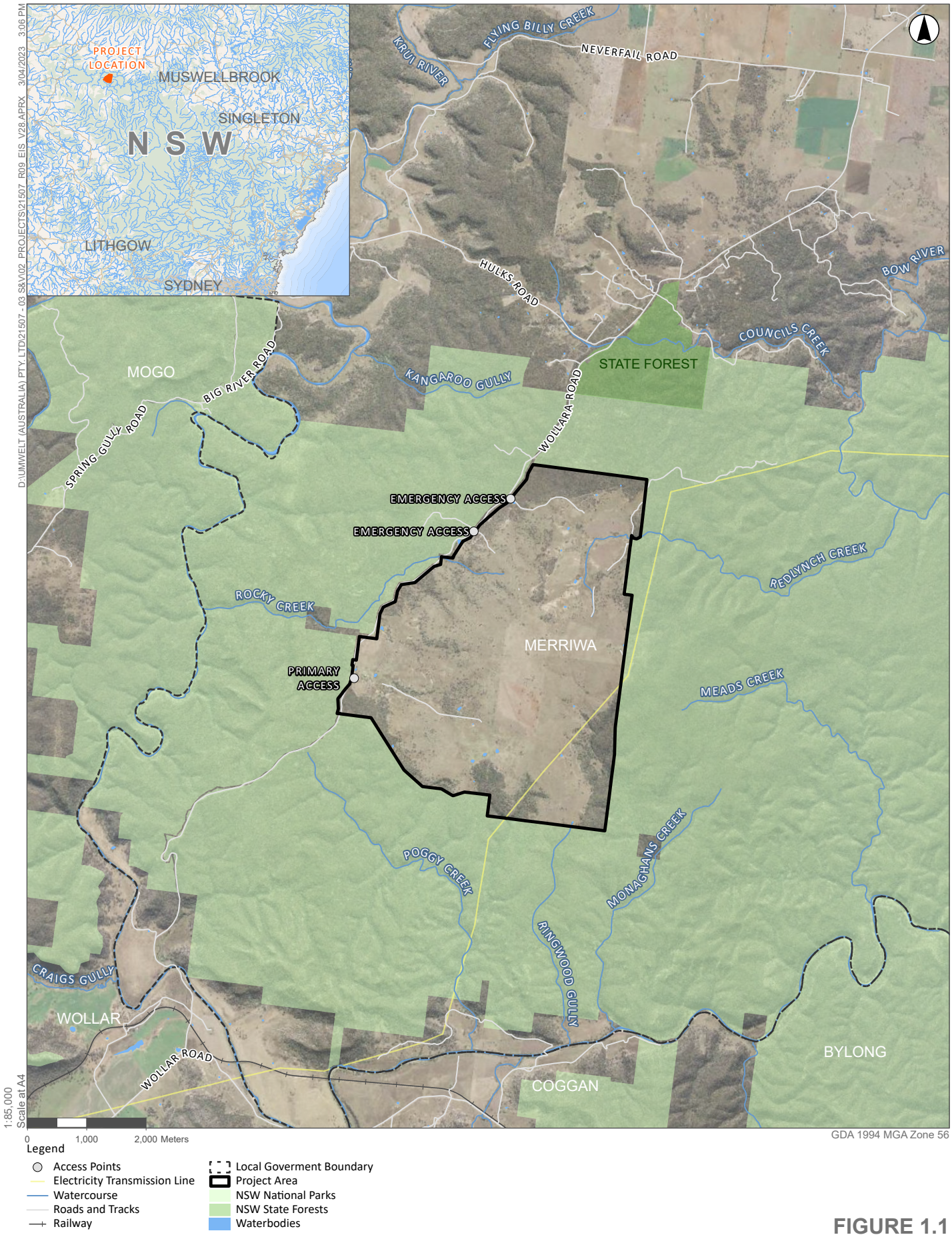

FIGURE 1.1

Location and Regional Context

Image Source: ESRI Basemap (2022) **Data source:** NSW LPI (2022), NSW DSFI (2022); NPWS Estate (2022); Lightsource BP (2022)

2.0 Statutory Framework

2.1 Planning Framework

The Project is a State Significant Development (SSD) under the *State Environmental Planning Policy (Planning Systems) 2021*, being a development for the purposes of electric generating works and with a capital investment value of over $30 million. A Development Application (DA) for the Project is required to be submitted under Part 4 of the EP&A Act.

The Department of Planning and Environment (DPE) issued the Secretary's Environmental Assessment Requirements (SEARs) for the Project on 1 February 2022. The SEARs and supporting documentation set out the matters of consideration and assessment required in the Environmental Impact Statement (EIS) which supports the DA.

2.1.1 SEARs

Specific guidance received as part of the SEARs indicates that a Rehabilitation and Decommissioning/ Closure Management Plan should include, but not be limited to:

- consideration of the management of underground cabling including recommendations that cabling is buried to a depth greater than 500 mm or is completely removed upon decommissioning to enable the land to return to full agricultural production including cropping
- description of the potential design criteria of the final land use and landform
- indicators which may be used to guide the return of the land back to agricultural production
- timeline for rehabilitation program
- identification, quantification and classification of likely waste streams and the measures to be implemented to manage, reuse, recycle and safely dispose of waste.

These matters have been addressed within this framework and will also need to be further specified within the DREMP.

2.1.2 Conditions of Consent

Should the DA be approved, conditions of consent will be issued for the construction, operation and decommissioning of the Project. Any conditions of consent relevant to the rehabilitation and decommissioning phase of the Project will need to be considered in development of the DREMP.

3.0 Lightsource bp Policy

3.1 Sustainability Strategy

Lightsource bp has a Global Sustainability Strategy which includes a framework and objectives across three key pillars: Environment, Energy and People as outlined in **Figure 3.1**.

Figure 3.1 Lightsource bp Sustainability Framework

The commitments to sustainability include:

- Environment: 'Be climate conscious'
  - reduce greenhouse gas emissions and create a pathway to 'Net Zero' emissions
  - minimise the environmental impacts of our projects
  - protect ecosystems and boost biodiversity
  - reduce, reuse, recycle through sustainable waste management practices.
- Energy: 'Inspire and enable communities to choose solar'
  - responsibly develop and build solar projects across the world
  - form meaningful partnerships with organisations focused on positive change
  - create educational opportunities through our projects
  - continue to collaborate with industry partners to champion best practice.

- People: ‘Creating a positive social impact for our people, partners, and communities’
    - positively impact our people, partners, and communities
    - commit to charitable outreach
    - maintain a high standard of ethical business practices
    - promote transparency within the global solar supply chain.

3.1.1 Waste Management

Through the sustainability strategy, Lightsource bp is changing waste management across the business through minimising their waste footprint, recycling as much as possible, and being part of the circular economy.

The Lightsource bp commitment to sustainability and waste management includes:

- development of decommissioning plans for every project to ensure the land is returned to its natural state
- decommissioning stage to remove all elements of the solar installation (above and below ground)
- a commitment to recycle and reuse as much decommissioning waste as possible
- development of a centralised solar panel recycling strategy that is trackable and traceable.

Solar panels typically consist of glass, aluminium, copper, silver, and semiconductor materials that can be successfully recovered and reused. By weight, more than 80 percent of a typical solar panel is glass and aluminium – both common and easy-to-recycle materials. Solar panels are often sold second hand or recycled by dedicated solar recycling depots.

Lightsource bp has committed to solar panel recycling across our projects in the construction and operational phase. This achieves a 94% recycling rate by weight for the panels. Lightsource bp currently has a partnership with Lotus Energy to manage the recycling of solar panels, including through the life of the Project if panels are damaged during construction and operations, and in the decommissioning stage (see **Section 5.3**).

Additionally, Lightsource bp will recycle all above-ground and sub terranean cables and structures (ferrous and non-ferrous).

3.1.2 Rehabilitation

Lightsource bp also has a strong commitment to protecting ecosystems and biodiversity and restoring land to its original stage. After successful decommissioning, no elements of the solar installation are left on site, either above or below ground, to allow the restoration of the previous land uses. The exception to this statement is any facilities that are deemed of value to the new land use purpose such as sheds, livestock yards, buildings, fencing or infrastructure such as water pipes.

4.0 Stakeholder Engagement

Lightsource bp (or asset owner) will continue to engage with community stakeholders in the decommissioning and rehabilitation phase of the Project according to the *Undertaking Engagement Guidelines for State Significant Projects* (Department of Planning, Industry and Environment, 2021). Stakeholders will include all relevant groups and individuals engaged during the Project approval phase, plus any additional stakeholders identified during the development process with an interest in the Project.

Engagement activities will include:

- regular updates to the Project website
- distribution of information sheets, fact sheets and/or FAQs to the local community
- face-to-face meetings and Project briefings
- regular community surveys
- operation of a community enquiry line/complaints line and the provision of timely responses to feedback, enquiries, and complaints by Lightsource bp (or asset owner).

In development of the DREMP a review of the stakeholder and community context would be required to identify any changes and additional legislation and guidelines that may be relevant to engagement activities.

5.0 Decommissioning and Rehabilitation Environmental Management Plan

5.1 DREMP Content

A detailed and site-specific DREMP would be developed prior to the commencement of this final stage of the Project to manage environmental risks. The DREMP would comprise at a minimum the following elements:

- a Decommissioning and Rehabilitation Program including:
    - objectives
    - identification of any infrastructure to be retained
    - identification of key environmental risks
    - identification of final land use and landform (refer to **Section 5.2** below for further detail)
    - Work Method Statements for key activities
    - waste management performance criteria (refer to **Section 5.3** below for further detail)
    - rehabilitation performance criteria (refer to **Section 5.4** below for further detail)
    - monitoring and reporting.
- schedule of works/hours of operation
- consideration of key environmental risks including:
    - stormwater
    - soil contamination
    - noise
    - air quality and dust
    - traffic and transport
    - flora and fauna
    - biosecurity (such as pests, diseases and weeds)
    - heritage
    - water contamination
    - waste
    - hazards.

5.2 Land Use and Landform

The DREMP would identify and describe design criteria to determine the final land use and landform for the Site. This would include consideration of:

- land ownership
- planning framework and land use zoning
- infrastructure to be retained for ongoing use
- infrastructure to be removed from the site
- rehabilitation and revegetation objectives
- climate and weather patterns.

In development of the DREMP and final land use and landform design criteria a review of the statutory context would be required to identify any changes and additional legislation and guidelines that may be relevant to this aspect.

5.3 Waste Management

Lightsource bp currently has a partnership with Lotus Energy to manage the recycling of solar panels, including through the life of the Project if panels are damaged during construction and operations, and in the decommissioning stage.

Lotus Energy is based in Melbourne and are in partnership with Lightsource bp to provide the option for solar panels to recycled. Lotus Energy works with renewable assets, including solar, data mining, battery storage, electric vehicle charging, and waste to energy with revenue paid to unit holders.

It is expected that a recycling partnership, with Lotus Energy and/or other providers will be maintained for the operational life of the Project and through decommissioning.

5.3.1 Guidelines and Principles

Management of waste streams generated during decommissioning will be guided by the principles of the waste hierarchy, where emphasis is placed upon reducing, reusing, and recycling prior to disposal of wastes. Appropriate and best-practice waste management will be implemented as part of the Project in accordance with the following legislation and guidelines:

- DPE Large Scale Solar Energy Guideline 2022
- NSW *Protection of the Environment Operations Act 1997* (POEO Act)
- NSW Protection of the Environment Operations (Waste) Regulation 2014
- NSW *Waste Avoidance and Resource Recovery Act 2001* (WARR Act)
- Commonwealth *Recycling and Waste Reduction Act 2020*.

The *NSW Waste Avoidance and Resource Recovery Strategy* (EPA, 2014a) outlines the requirements for best practice waste management, which combines the principles of ecologically sustainable development with the implementation of resource management hierarchy principles as specified in the WARR Act (refer to **Figure 5.1**):

- avoidance of unnecessary resource consumption
- resource recovery (including reuse, reprocessing, recycling, and energy recovery consistent with the most efficient use of the recovered resources)
- disposal, including management of all disposal options in the most environmentally responsible manner.

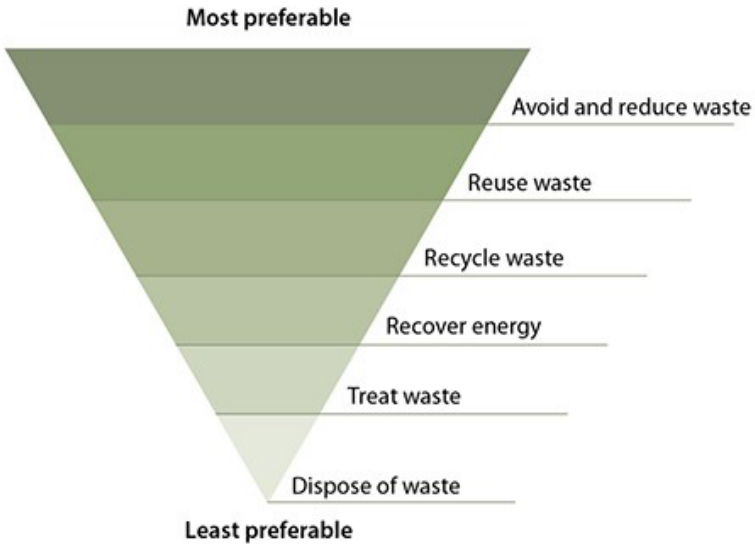

Figure 5.1 Waste Hierarchy

Source: EPA, 2014a.

In development of the DREMP and Waste Management Sub-Plan a review of the statutory context would be required to identify any changes and additional legislation and guidelines that may be relevant to the management of waste. Further information is available in Section 6.14 of the Environmental Impact Statement.

Predicted Waste Streams

Currently, under the *Waste Classification Guidelines – Part 1: Classifying waste* (EPA, 2014b), waste can be classified into six different classes based on risks to the environment and human health. These are:

- special waste – asbestos, waste tyres, clinical wastes
- liquid waste – wastewater effluent and fuels and lubricants
- hazardous waste – contaminated soils
- restricted solid waste
- general solid waste (putrescible) – food waste, organics, and animal wastes
- general solid waste (non-putrescible) – glass, plastic, rubber, bricks, concrete, metal, paper, cardboard, and other domestic waste.

The waste types expected to be generated by the Project during the decommissioning phase are included in **Table 5.1**, assessed in the context of the above guidelines.

Table 5.1 Potential Decommissioning Wastes

Expected Waste Type	Waste Classification	End use
Green waste from removal of infrastructure above and below ground as well as landscaping	**Green Waste**	Reuse on-site where appropriate or recycled
Waste oils, lubricants and liquids and paints	**Hazardous waste**	Transported to licensed facility
Sewage ablutions or portaloos	**Liquid Waste**	Transported to licensed facility
Solar Farm infrastructure (solar panels, steel posts, electrical cabling, Lithium Phosphate iron battery, inverters, glass, silicon wafers, silver)	**General Solid Waste (Non-Putrescible)**	Recycled
Security fencing	**General Solid Waste (Non-Putrescible)**	Remain in situ, reuse on site or recycled.
Site office	**General Solid Waste (Non-Putrescible)**	Remain in situ
Access Roads	**General Solid Waste (Non-Putrescible)**	Remain in situ
Domestic waste	**General Solid Waste (Non-Putrescible)**	Recycle If not possible dispose at suitable facility.

In development of the DREMP and Waste Management Sub-Plan, a review of the relevant statutory waste classification requirements would be required.

Wastes produced during decommissioning provide an opportunity to continue beneficial outcomes associated with the Project by contributing to regional or nationwide circular economy objectives and prioritising the reuse or recycling of all materials.

Waste generated by the Project that cannot be reused or recycled would be disposed of at suitable waste management facilities within the local LGAs with adequate capacity.

5.3.2 Waste Management Plan

As part of the DREMP a Waste Management Plan would be prepared including detailed breakdown of the waste types and quantities in accordance with relevant legislation and guidelines. Lightsource bp is committed to ensuring waste generated by the Project can be reused and recycled in accordance with the waste management hierarchy. Some wastes may need to be disposed of to landfill.

The Waste Management Plan would include:

- a summary of the waste types, classification and estimated annual quantities of wastes produced during the construction of the Project
- measures to manage waste disposal in accordance with the principles of the waste hierarchy, with emphasis on reducing, reusing, and recycling wastes prior to disposal

- the procedure for assessing, classifying, and storing waste in accordance with the EPA's *Waste Classification Guidelines* (EPA, 2014b) (or other relevant guidelines at the time)
- procedures for transport and disposal of waste
- monitoring, record keeping and reporting, including the use of waste tracking data to demonstrate the lawful disposal of contaminated products, waste or residues generated by the Project (if any).

5.3.3 Roles and Responsibilities

Lightsource bp (or the asset owner) will be responsible for the development and implementation of the DREMP including compliance by contractors and staff.

The DREMP will include a detailed description of the roles and responsibilities associated with this phase in the context of the broader Environmental Management Strategy (EMS).

5.4 Rehabilitation

A Rehabilitation Program would be developed for the site and undertaken in stages in accordance with relevant conditions of approval. The Rehabilitation Program would likely include the following key elements:

- consultation with stakeholders to establish desired outcomes and rehabilitation criteria
- progressive and/or staged rehabilitation of disturbed areas during decommissioning including:
    - backfilling of all trenches and excavations to maintain existing or desired future landform
    - laying of topsoil where required for future use including continued agricultural use
    - revegetation with native species where suitable to allow continued agricultural use of the site or other agreed future land use
    - reseeding of areas of pasture/crop dependent on ongoing agricultural use.
- performance criteria
- monitoring.

Consideration of the following would also be required in development of the Rehabilitation Program:

- staging – following or alongside decommissioning activities
- timing – seasons and weather predictions
- techniques – seeding techniques suitable to the site and conditions
- species – suitable native and endemic species as well as hydroseed mixes
- fencing – retention of and any new fencing required to protect rehabilitation activities
- maintenance – requirements for weed management and contingency for low rainfall conditions
- monitoring – regular monitoring of rehabilitated areas for a defined period after decommissioning (likely to be minimum 2 years).

The likely disturbance footprint associated with decommissioning will be similar to that of the construction phase and many of the disturbance avoidance mechanisms employed in the early phases of the Project will reduce rehabilitation requirements following decommissioning. For example, underground cabling required to connect parts of the Project to the substation and BESS in the south-eastern section of the Project Area has been strategically located within the footprints of the access roads to minimise potential impacts. Assuming the ongoing agricultural use of the site during operation of the Project to continue to manage vegetation in and around infrastructure, it is unlikely that significant or high value vegetation would be required to be removed during decommissioning.

Lightsource bp has committed to the implementation of the following specific control measures to minimise the impacts of the Project on biodiversity and these would continue to apply during the decommissioning phase:

- workforce education and training
- implementation of vegetation protection zones for areas to be retained
- ecologist pre-clearance surveys and supervision of works
- erosion and sedimentation control measures
- weed management
- fencing and access control to avoid unplanned human and livestock interference and disturbance to retained areas
- fauna exclusion measures to prevent entrapment of fauna within site infrastructure.

In development of the DREMP and Rehabilitation Program a review of the statutory context would be required to identify any changes and additional legislation and guidelines that may be relevant to the management of biodiversity. Additional survey work may be required as part of preparation of the DREMP and prior to clearance of any vegetation on site, excluding agricultural crops and weeds.

5.5 Monitoring and Reporting

The DREMP would include measures to ensure adequate monitoring and reporting requirements are identified and implemented.

This would include consideration of:

- future land use and ownership
- performance criteria established within the DREMP
- conditions of consent.

5.6 Contingency Plan

The DREMP would include a contingency plan for the decommissioning and rehabilitation phase of the Project.

6.0 References

Department of Planning, Industry and Environment, 2021. *Undertaking Engagement Guidelines for State Significant Projects.*

Department of Planning and Environment. 2022. *Large-Scale Solar Energy Guideline.*

Environment Protection Authority, 2014a. *NSW Waste Avoidance and Resource Recovery Strategy 2014–2021*.

Environment Protection Authority, 2014b. *Waste Classification Guidelines – Part 1 Classifying Waste.*

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