

**Green Gold Energy Pty. Ltd**

## 6.3 MW Solar Farm & 11 MW BESS 1000 Burkes Creek Road, The Rock

Preliminary Risk Screening

Reference: PRS\_01

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# Executive Summary

The proposed Green Gold Energy Pty Ltd (GGE) Solar Farm and Battery Energy Storage System (BESS) is assessed against the Resilience and Hazards SEPP to determine whether it is considered “potentially hazardous industry” or “potentially offensive industry” by virtue of the storage and use of dangerous goods on site.

The screening assessment is based on planned dangerous goods storage conditions provided by GGE for the solar farm (Class 3, Class 6 and Class 8). GGE has not provided quantities for those dangerous goods that are to be stored on site. Therefore, the storage quantities assessed against the Resilience and Hazards SEPP were taken to be the upper limit of the planned dangerous goods storage conditions to ensure a conservative assessment. Should GGE store less than the maximum capacity of dangerous goods, the analysis for this assessment remains the same. It is expected that GGE will not exceed the storage quantities estimated.

On this basis, the screening assessment determined that all classes of dangerous goods are below the applicable threshold quantity. The transportation screening assessment shows that the quantity of dangerous goods and the number of vehicle movements are below the required thresholds.

As the Resilience and Hazards SEPP screening thresholds are not exceeded, the development is not considered a potentially hazardous industry and **no PHA is required.**

Lithium-ion batteries (LIBs) are Class 9 (miscellaneous) dangerous goods and are therefore excluded from the Preliminary Risk Screening process defined in the Resilience and Hazards SEPP and related guidance material. Further, the Industry-Specific Planning Secretary’s Environmental Assessment Requirements (SEARs) for large-scale solar energy states that “PHAs are not required for lithium-ion batteries below 30MW”. As such, the risks associated with LIBs are to be addressed through the appropriate design of the facility, rather than through the Resilience and Hazards SEPP process.

Specifically, Arup makes the following recommendations with respect to LIBs:

- The BESS shall be designed and laid out in accordance with the battery manufacturer's requirements, including separation distances in accordance with UL 9540A test results.
- An Asset Protection Zone (APZ) of no less than 10 m around the BESS shall be included in the site layout. This is not in addition to any APZ specified with respect to bushfire risk, and is likely to be fully addressed by the bushfire APZ.

Additional control measures may be identified and implemented through the detailed design process.

Recommendations have been provided for the storage of the primary dangerous goods classes represented at the site. These will assist in ensuring that the storage requirements are met by GGE.



# 1. Introduction

Green Gold Energy Pty Ltd (GGE) has proposed development of an 11 MWh battery energy storage system (BESS) and a 6.25 MW DC solar farm at 1000 Burkes Creek Road, The Rock (the Site). This solar farm will generate renewable energy for the Australian electrical grid to service Australia's growing electricity demand. Figure 1 shows the proposed development plan.

As a result of the storage and use of dangerous goods at the GGE site, the development application is required to be assessed against the Resilience and Hazards SEPP as "potentially hazardous industry". This report documents the assessment process and the outcome.

The screening was performed in reliance on the quantities estimated from the dangerous goods (DG) storage information provided by GGE which may include Class 3, Class 6 and Class 8 materials. DGs are to be stored in 250 L cabinets and separated when incompatible. Therefore, the quantity stored for each dangerous goods class will be taken as 250 L as they cannot exceed the maximum quantity per cabinet. This is the most accurate estimate based on available information from GGE.

Lithium-ion batteries (LIBs) are Class 9 (miscellaneous) dangerous goods and are addressed in this assessment separately from the DGs that may be stored in the above-mentioned DG cabinets.

RFI feedback from GGE is provided in Appendix A.



Figure 1: Proposed site plan (Source: GGE)

## 2. Resilience and Hazards SEPP

The New South Wales State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) commenced on 1 March 2022 [1]. The Resilience and Hazards SEPP consolidates the following SEPPs, which were withdrawn on the same day:

1. SEPP (Coastal Management) 2018 (Coastal Management SEPP)
2. SEPP 33 – Hazards and Offensive Development (SEPP 33)
3. SEPP 55 – Remediation of Land (SEPP 55)

SEPP 33 was previously used as the basis for assessing whether a development fell under the policy’s definition of “potentially hazardous industry” or “potentially offensive industry”.

The consolidation of the three previous SEPPs into the new Resilience and Hazards SEPP is part of the NSW Government’s SEPP consolidation project, which is aimed at reducing the complexity of the NSW planning system; 45 previous SEPPs have been consolidated into 11 new SEPPs.

No policy changes have been made in the Resilience and Hazards SEPP; all changes are administrative. The same screening process used to assess whether a development is “potentially hazardous” or “potentially offensive” is applicable. Hence, the Hazardous and Offensive Development Application Guidelines *Applying SEPP 33* (2011) [2] remains relevant. *Applying SEPP 33* outlines the screening process used to assess whether the Resilience and Hazards SEPP applies (in the context of potentially hazardous or potentially offensive industry).

The Resilience and Hazards SEPP replaced the previous SEPP 33 – Hazards and Offensive Development in March 2022. There was no change to the policy itself or the criteria against which any development application is assessed; the change was administrative only. Any references to SEPP 33, particularly in extracts from *Applying SEPP 33*, should be taken as references to the Resilience and Hazards SEPP.

### 3. The Resilience and Hazards SEPP Screening Process

*Applying SEPP 33* describes the process to be followed when assessing whether a development application is to be considered potentially hazardous. Figure 1 of *Applying SEPP 33* (The SEPP 33 Process) is reproduced below in Figure 2.

Figure 1: The SEPP 33 Process

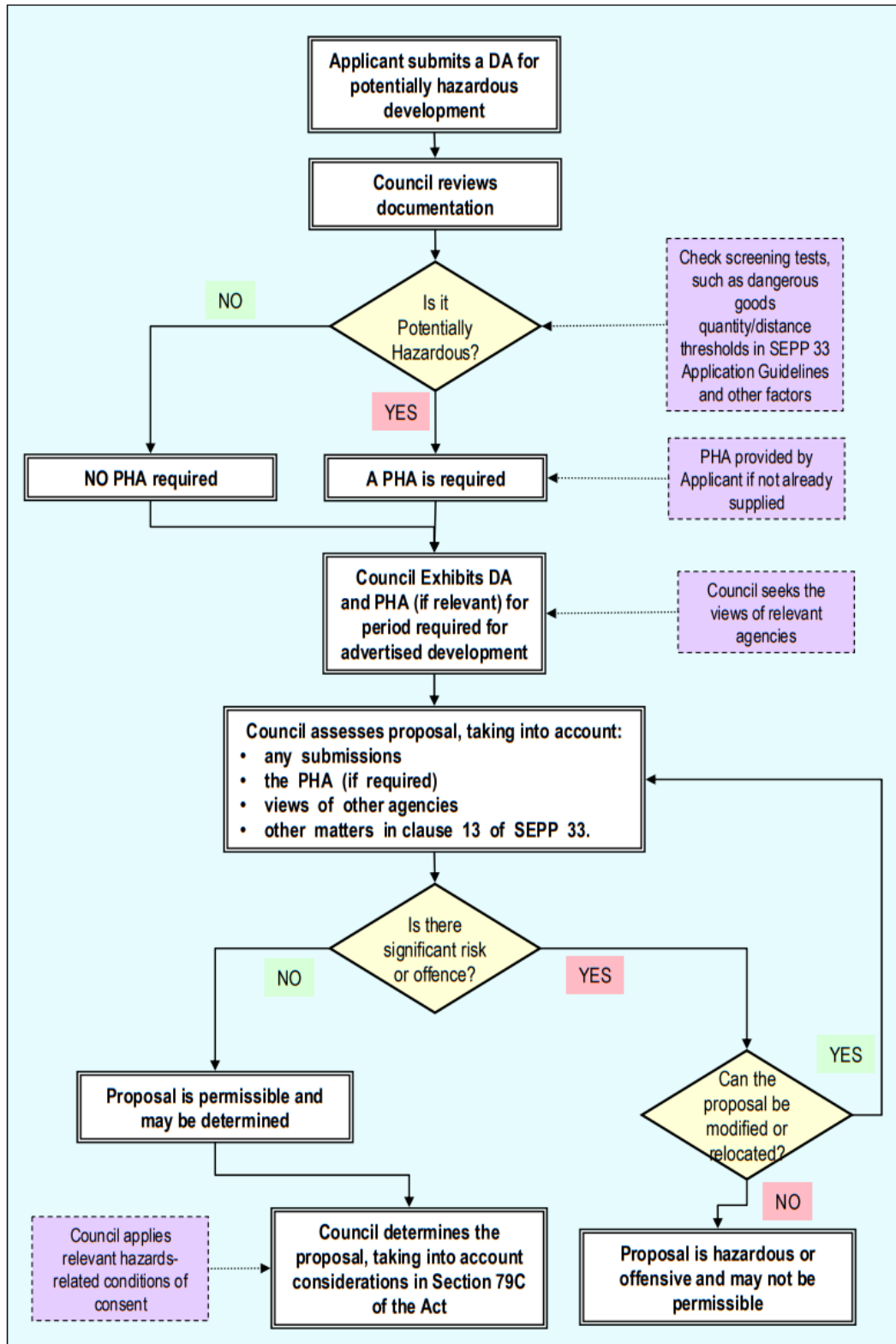


Figure 2: The Resilience and Hazards SEPP Process (extract from *Applying SEPP 33* [2])

The screening method used to determine whether a development is potentially hazardous varies based on the class of dangerous good being assessed. Table 1 lists the table and figure references in *Applying SEPP 33* for the respective screening methods for each class of dangerous good.

**Table 1: Screening Method References in *Applying SEPP 33* [2]**

Class	Description	Method to Assess Quantity ( <i>Applying SEPP 33</i> references)	Method to Assess Transportation ( <i>Applying SEPP 33</i> references)
1.1	Explosives – substances and articles which have a mass explosion hazard	Figure 5 (if > 100 kg)	Table 2
1.2	Explosives – substances and articles which have a projection hazard but not a mass explosion hazard	Table 3	Table 2
1.3	Explosives – substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both but not a mass explosion hazard	Table 3	Table 2
2.1	Flammable gases – pressurised (excluding LPG)	Figure (if > 100 kg)	Table 2
2.1	Flammable gases – liquified (pressure) (excluding LPG)	Figure 7 (if > 500 kg)	Table 2
2.1	Flammable gases – LPG (above and below ground)	Table 3	Table 2
2.3	Toxic gases	Table 3	Table 2
3PGI	Flammable liquids	Figure 8 (if > 2 tonne)	Table 2
3PGII	Flammable liquids	Figure 9 (if > 2 tonne)	Table 2
3PGIII	Flammable liquids	Figure 9 (if > 2 tonne)	Table 2
4	Flammable solids	Table 3	Table 2
5	Oxidisers, organic peroxides	Table 3	Table 2
6	Toxic substances	Table 3	Table 2
7	Radioactive material	Table 3	Table 2
8	Corrosive substances	Table 3	Table 2

Classes 1.4, 1.5, 1.6, 2.2 and 9 are excluded from the risk screening as they are considered to not be potentially hazardous with respect to off-site risk in accordance with *Applying SEPP 33* [2]. Combustible liquids such as diesel are not considered dangerous goods in accordance with *Applying SEPP 33* and are also excluded.

Therefore, the LIBs installed at the site are not subject to the Preliminary Risk Screening process under the Resilience and Hazards SEPP process. However, as the most significant quantity of DGs proposed to be at the site, the risks associated with LIBs are addressed separately within this report.



## 4. Preliminary Risk Screening Results

Dangerous goods storage conditions were provided by GGE for storage at the proposed solar farm development. Table 2 presents the results of the screening assessment. The column on the right, labelled “minimum quantity per load” is extracted from Table 2 in *Applying SEPP 33*. *Applying SEPP 33* states that “if quantities are below this level, the potential risk is unlikely to be significant unless the number of traffic movements is high”. *Applying SEPP 33* uses the Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.9 (ADGC) categorisation system.

Any assumptions made to estimate a class and/or quantity of dangerous goods to be stored and handled at the solar farm are based on the proposed storage conditions provided by GGE. The quantity of each dangerous good stored was estimated to be the upper limit of the capacity of the proposed dangerous goods storage cabinets. Therefore, there can be no more than 250 L of any class of dangerous goods stored and handled at the solar farm.

**Table 2: Screening Results**

Class	Quantity (kg or L)	Quantity threshold (kg or L)	Quantity threshold exceeded?	Minimum quantity per load (tonne)	Maximum peak weekly vehicle movements Exceeded? (If minimum quantity exceeded)	Transportation threshold exceeded?
3 PGII	250	5000	No	10	NA	No
6.1	250	500	No	3	NA	No
8	250	5000	No	5	NA	No
9 (LIBs)	11 MW	Not subject to the Preliminary Risk Screening process.				

### 4.1 Quantity Screening

The storage quantity for each class of dangerous good is below the screening threshold as identified in Table 2. The quantity screening threshold is not exceeded.

### 4.2 Transport Screening

The entire storage quantity for each class of dangerous good is substantially below the minimum threshold quantity per load listed in *Applying SEPP 33* as identified in Table 2.

The transportation screening threshold is not exceeded.

### 4.3 Screening Conclusion

As neither the quantity screening threshold nor the transport screening threshold is exceeded, a preliminary hazard analysis (PHA) **is not required**. This report therefore satisfies the relevant requirements with respect to the Resilience and Hazards SEPP.

Further, the Industry-Specific Planning Secretary’s Environmental Assessment Requirements (SEARs) for large-scale solar energy states that “PHAs are not required for lithium-ion batteries below 30MW” [3].

The hazards associated with the materials being stored and used on the Site must still be managed appropriately. Recommendations are provided in Section 5 of this report.

## 5. Recommendations

Although the quantity of DGs stored on site does not exceed the screening threshold and a PHA is not required, the following general recommendations are made with respect to the safe storage and use of the DGs on site.

### 5.1 Lithium-ion Batteries (Class 9 Miscellaneous)

As neither the Preliminary Risk Screening process nor the industry-specific SEARs for large-scale solar energy require a PHA to be developed for 11MW of battery capacity, the risks associated with LIBs are to be addressed through the appropriate design of the facility, rather than through the Resilience and Hazards SEPP process.

The detailed design process will address the risks associated with LIBs, including the consideration of the specific risks associated with the battery technology ultimately chosen.

Arup makes the following recommendations with respect to LIBs:

- The BESS shall be designed and laid out in accordance with the battery manufacturer's requirements, including separation distances in accordance with UL 9540A test results.
- An Asset Protection Zone (APZ) of no less than 10 m around the BESS shall be included in the site layout. This is not in addition to any APZ specified with respect to bushfire risk, and is likely to be fully addressed by the bushfire APZ.

Additional control measures may be identified and implemented through the detailed design process.

### 5.2 Flammable Liquids (Class 3)

GGE has proposed allowance for the storage of Class 3 dangerous goods such as petrol in a 250 L dangerous goods storage cabinet. The expected quantity of flammable liquids is no more than 250 L. The storage and handling of flammable liquids is addressed in AS 1940:2017 *The storage and handling of flammable and combustible liquids*.

This quantity of flammable liquids meets the definition of minor storage (given in Table 2.1 of AS 1940:2017); further details regarding the specific location of the flammable liquid storage and, if indoors the floor area of the storage locations are required to confirm this classification.

Section 2 of AS 1940-2017 lists the requirements for minor storage. Storing class 3 materials in a AS 1940 compliant flammable liquid cabinet will satisfy many of those requirements.

### 5.3 Toxic and Infectious Materials (Class 6)

GGE has proposed allowance for the storage of Class 6 dangerous goods such as pesticides in a 250 L dangerous goods storage cabinet. The expected quantity of toxic materials on site is no more than 250 L. The storage of these goods is addressed in AS/NZS 4452:1997 *The storage and handling of toxic substances*.

Section 2 of AS/NZS 4452:1997 lists the requirements for minor storage. The following bullet points represent a high-level summary:

- Storage areas shall be secured against unauthorised entry;
- A supply of water shall be nearby for hygiene;
- Adequate ventilation shall be provided;
- Packages should be closed when not in use;
- Packages shall be kept away from heat sources; and
- Packages shall be kept in a manner to avoid spillage.

Full details of requirements can be found in the standard.

#### **5.4 Corrosive Materials (Class 8)**

GGE has proposed allowance for the storage of Class 8 dangerous goods such as cleaning agents in a 250 L dangerous goods cabinet. The expected quantity of corrosive materials on site is no more than 250 L. The storage of this class of dangerous good is outlined in AS 3780:2008 *The storage and handling of corrosive substances*.

Section 2 of AS 3780:2008 lists the requirements for minor storage of materials of this nature. The following list represents a high-level summary:

- A supply of water shall be available at a nearby location;
- Adequate ventilation should be provided;
- Incompatible substances shall not be kept near corrosive materials;
- Packages should be kept away from sources of heat;
- Surfaces where materials are stored shall be resistant to corrosive nature of the materials; and
- Appropriate spillage retention shall be in place where packages are opened, or material transferred and containers to which the material will be transferred is confirmed suitable for corrosive materials.

A full list of the requirements can be found in the standard.

## 6. References

- [1] “Resilience and Hazards SEPP,” NSW Department of Planning and Environment, March 2022. [Online]. Available: <https://www.planning.nsw.gov.au/policy-and-legislation/coastal-and-marine-management/coastal-management/resilience-and-hazards-sepp>.
- [2] “Applying SEPP 33,” NSW Department of Planning, January 2011. [Online]. Available: <https://www.planning.nsw.gov.au/sites/default/files/2023-03/hazardous-and-offensive-development-application-guidelines-applying-sepp-33.pdf>.

# Appendix A

## RFI Responses

A		B	C
3	Items	Arup RFI	GGE Response
		<p>Please provide any additional items to the proposal scope of works:</p> <p>This project involves the development of a solar farm with integrated battery storage.</p> <p><b>SoW:</b></p> <p>Solar array: DC capacity of 6.30 MW</p> <p>Battery storage: 11 MWh capacity 4 modules</p> <p>Site specifications: ~1692m fence perimeter enclosing ~40-acre area</p> <p>Additional infrastructure: inverter station, HV switchboard, and site amenities</p> <p>Grid connection: 22kV distribution lines connecting to the Essential Energy network</p>	<p>An internal track is also proposed, track will be an unsealed road made of crushed rock approx. 6m wide so it can accommodate B-Double trucks.</p>
4	#1		
5	#2	Please provide technology specs, capacity per module and any design drawings, images you may have of the BESS /Solar Array tech	In Data room under Data Sheets
6	#3	Please provide proposal footprint as shapefile. If you have pdf versions of the design, sections and elevations of the proposal that would be great to provide in SEE.	In Data room under Site
		<p>Construction Methodology - If you have a CEMP for this site then we could use info from that. Ideally we are looking for:</p> <ul style="list-style-type: none"> <li>- Proposed site access points &amp; vehicle routes (if planned, otherwise we can make an assumption)</li> <li>- Workforce numbers</li> <li>- Earthworks proposed</li> <li>- Proposed staging</li> <li>- List of const equipment</li> <li>- Site facilities - location of construction compounds</li> <li>- Proposed construction date or quarter Q1 2026</li> </ul>	<p>CEMP template in data room under Site.</p> <ul style="list-style-type: none"> <li>- Entry and vehicle routes as per site plan unless traffic report states other wise.</li> <li>- We are looking at roughly 10-20 workers on site during construction phase.</li> <li>- Trenching to install trackers and to lay a concrete foundation for BESS and inverter.</li> <li>- 3 stages of construction, civil works, mechanical installation &amp; electrical connection.</li> <li>- Construction equipment include: excavator, skid steer, crane &amp; telehandler</li> <li>- Site facilities shown on site plan as site amenities which will include office, toilet and kitchen</li> <li>proposed construction commencement in 2026</li> </ul>
			<p>Workers will be traveling to site every day in their vehicles. Heavy vehicles are used to transport equipment and deliver installation materials which will happen throughout the construction phase but not on a regular basis. Currently unable to provide time periods as this falls down to the logistics company</p>
8	#5	Peak traffic generation for construction – light vehicles and heavy vehicles quantified separately as well as time periods of travel	Maintainance crew visiting site a couple of times a year. No permanent staff on site.
9	#6	Peak traffic generation for <b>operation</b> – light vehicles and heavy vehicles quantified separately as well as time periods of travel	Parking indicated on site plan
10	#7	Parking provision during construction and operation - assume onsite for both phases ?	No
11	#8	Any proposed road or footpath closures or removal of parking during construction and operation ( we assume no)	Will update site plan as per stormwater report (if required)
12	#9	Stormwater & Drainage details?	Will update site plan as per VIA report (if required)
13	#10	Any proposed landscaping details?	Yes, site will be fenced off and security cameras will be installed. Typical designs in data room under data sheet
14	#11	Details on security measures for the site i.e. would you be installing security fence, cameras and lighting?	Vegetation control, cleaning of panels, replacement of damaged or faulty equipment, general servicing.
15	#12	Details on operation phase and maintenance phase (doesn't have to be final details, essentially what we anticipate if you have items from a previous project we can use this or make assumptions)	To be produced at a later stage
16	#13	Details on decommissioning	Dangerous goods cabinet on site that will store petrol, diesel, all chemicals and spilt kits
17	#14	A list of all dangerous goods expected to be stored on site i.e. backup generators / diesel storage, petrol for mowers, pesticides etc. (we can assume no storage of dangerous goods on site?)	We will avoid removing any trees, once survey is complete we will adjust the site plan accordingly.
18	#15	Confirm if design can avoid impacting tree nearby BESS location? We can assume no tree removal will be undertaken.	