Arrowsmith AHP1 Hydrogen Project

Proposal Content Document

Table 1: General proposal content description

Proposal title	Arrowsmith Hydrogen Project (AHP 1)
Proponent name	Infinite Green Energy
Short description	Infinite Green Energy propose to construct and operate a Green energy wind and solar powered Hydrogen production facility within freehold Lots 3, 4, 100 and 6110 located in Arrowsmith 30 km south of Dongara, within the Shire of Irwin, Western Australia (WA). Infinite Blue Energy purchased the **1929.68 ha** property due to the site's abundance of wind and solar power combined with abundant quantity of quality fresh water. The previous property use involved sheep, cattle and goats grazing. The Infinite Green Energy proposal layout has been arranged to avoid wetlands, karst formations and Carnaby's Black Cockatoo habitat on the property. Manufacture of Hydrogen requires a considerable electrical power resource and IGE plan to install a combination of wind Turbines and Solar Array to provide Green Generated Electricity to produce Hydrogen. The solar system proposal consists of 65 MW to 85 MW of solar panels to be constructed on 60 percent of the properties existing cleared land. Solar Footprint total extent **139.85 ha** The Wind Turbine proposal involves installing up to 25 Turbine's 6MW in size positioned strategically around the property to minimize impact. The property contains **213.34 ha** of previously disturbed vegetation. The proposal disturbance footprint total is **242.28 ha.** The construction proposed vegetation clearing area is **139.31 ha** Construction is planned to commence in quarter 1 2023 for production operations commencing in quarter 3 2025, subject to approvals and availability of equipment. The scope of this referral includes the construction of the Arrowsmith Hydrogen Project including: • solar farm (Minimum 65 MW to Maximum 85 MW) • wind turbines (22 minimum to 25 maximum x 6 MW) • water supply (groundwater) • processing plant output (Max Extent 23 tpd up to 42 tpd) • storage and offloading

	Once commissioned the plant will produce liquified compressed hydrogen utilising site ground water with final product transported via hydrogen fuelled road tankers to end users.
Date	10 June 2022

Table 2: Proposal content elements

Proposal element	**Location / description**	**Maximum extent, capacity or range**	
Physical elements/Construction			
Development GEO location	Figure 6	Maximum Extent	1929.68 ha
Solar Farm	Figure 1	Maximum Extent Previously Disturbed Area Clearing Required	139.85 ha 82.73 ha 57.12 ha
Main Plant / trucking loop	Figure 1	Maximum Extent Previously Disturbed Area Clearing Required	35.88 ha 0.47 ha 35.41 ha
Marl Pits	Figure 1	Maximum Extent Previously Disturbed Area Rehabilitation	4.19 ha 4.19 ha 4.19 ha
Project Fire / Roads	Figure 1	Maximum Extent Previously Disturbed Area Clearing Required	27.54 ha 12.45 ha 15.09 ha
Electrical Line Route	Figure 1	Maximum Extent Previously Disturbed Area Clearing Required	1.91 ha 0.35 ha 1.56 ha
Wind Turbines	Figure 1	Maximum Extent Previously Disturbed Area Clearing Required	22.17 ha 1.09 ha 21.08 ha
Property Boundary roads	Figure 1	Maximum Extent Existing Disturbed Area Clearing Required	7.83 ha 3.87 ha 3.97 ha
Met Mast	Figure 1	Maximum Extent Existing cleared Area Clearing Required	0.91 ha 0.00 ha 0.91 ha
Existing met mast	Figure 1	Existing cleared Area	2.00 ha

Property Maximum Extent		1929.68 ha
Previously Disturbed Vegetation		102.96 ha (Within Construction Extent)
Project Proposal Clearing Extent		139.31 ha
Permanent site clearing footprint		242.28 ha
Post Construction Rehabilitation		14.32 ha
There is a requirement to comply with local and state Fire Safety requirements therefore 15.09 ha of vegetation clearing is allocated to install the fire access roads within the proposal 139.31 ha.. Installation of the roads is required regardless of proposal approval.		
Operational elements		
Wind power production		Up to 25 Turbines 6 MW in size generating up to 150 MW
Solar power production and battery storage system		Up to 65 MW to 85 MW generation capacity 20 MW of battery storage
Water abstraction	Licence under Application	Licence applied for to extract up to 2,340 kL per day, supplied from three new licenced bores in close proximity to the main plant. The property contains two existing bores which IBE will continue to use under licence for livestock and lower property fire water.
Hydrogen production		Maximum Extent 23 tonnes to 42 tonnes per day.
Salt emissions	N/A	Up to 1100 kg per day (dependent on bore water quality.)Note. Provision to dispose offsite.
Onsite Facilities		No site accommodation is planned for the construction phase and all sewage treatment for construction will be managed by temporary above ground portable tanks. Plant will have amenities for 10 plant operators over the long term.
Proposal elements with greenhouse gas emissions		
Construction elements: Note Scope 3 not required.		
Scope 1:	7,182 tCO_2-e per annum	
Scope 2:	0	
Operation elements:		
Scope 1:	316 tCO_2-e per annum	
Scope 2:	0	

Decommissioning and Rehabilitation

The project is expected to have a life of 25 years and with asset life extension can operate indefinitely.

At the project end of life if actioned, decommissioning activities include:

- Removal of all vehicles, machinery, and buildings
- Removal from site and recycling or appropriate disposal of all infrastructure and waste
- Decommissioning of water bores
- Remediation of any contaminated soil (as required)
- Rehabilitation and revegetation of disturbed areas.

There will be 14.32 ha under rehabilitation following construction activities.

In the event project 25-year service life extension options are not exercised and rehabilitation is actioned an area of 105.93 ha will require vegetation reinstatement.(The net value calculated considering 14.32 ha of construction re vegetation fire roads install 15.09 ha area and boundary 3.97 ha . Rehabilitation will be completed in accordance with the Rehabilitation Plan. Monitoring is to be undertaken annually until set quantitative completion criteria are achieved as outlined in the Rehabilitation Plan.

Commissioning

Commissioning will be conducted in stages, with systems commissioned as they are completed. A commissioning plan shall ensure that the commissioning of systems using non-hazardous products will be maximised before the production of hydrogen. The construction contractor will hand over the construction completion to the commissioning team nominated by the Proponent. It is anticipated that the commissioning team will be a mixture of contractor engineers, Proponent's engineers, operations personnel, and commissioning subcontractors.

Due to the hazardous nature of hydrogen and oxygen, and the complexity of the facilities, a commissioning and completions management system is to be utilised. The development of the commissioning and completions management system is undertaken during the detailed engineering phase.

Commissioning and Start-Up of the facilities will be staged; the expected order is as follows subject to change:

- Power Generation – Solar Farm, Wind Turbines, Battery Energy Storage System (BESS)
- Utilities
- Hydrogen production
- Hydrogen liquefaction and storage
- Liquid hydrogen offloading

Start-Up will take place once completion assurance is complete, and each area is approved "Ready for Start-Up" (RFSU). The commissioning team will begin with a mark-up of the key deliverables such as P&IDs to define the system boundaries. IBE will identify the subcontractors and vendors required for commissioning and develop the detailed scopes of work. This will include:

- Leak Testing
- Testing Cleaning and Drying Services
- Specialist Package Commissioning Engineers (e.g., Wind turbines, LH2 and H2 Production)

Other elements which affect extent of effects on the environment		
Proposal time*	Maximum project life	Preliminary 25 years Every 25 years asset life extension review, and possible extension works to be conducted.
	Construction phase	Approximately 24 months
	Commissioning phase	Approximately 6 months
	Operations phase	25 years

** Proponents should only provide realistic timeframes to avoid unnecessary change to proposal applications at referral (section 38C), assessment (section 43A) or post assessment (section 45C).*

Figure 6 Proposed Site GEO Location

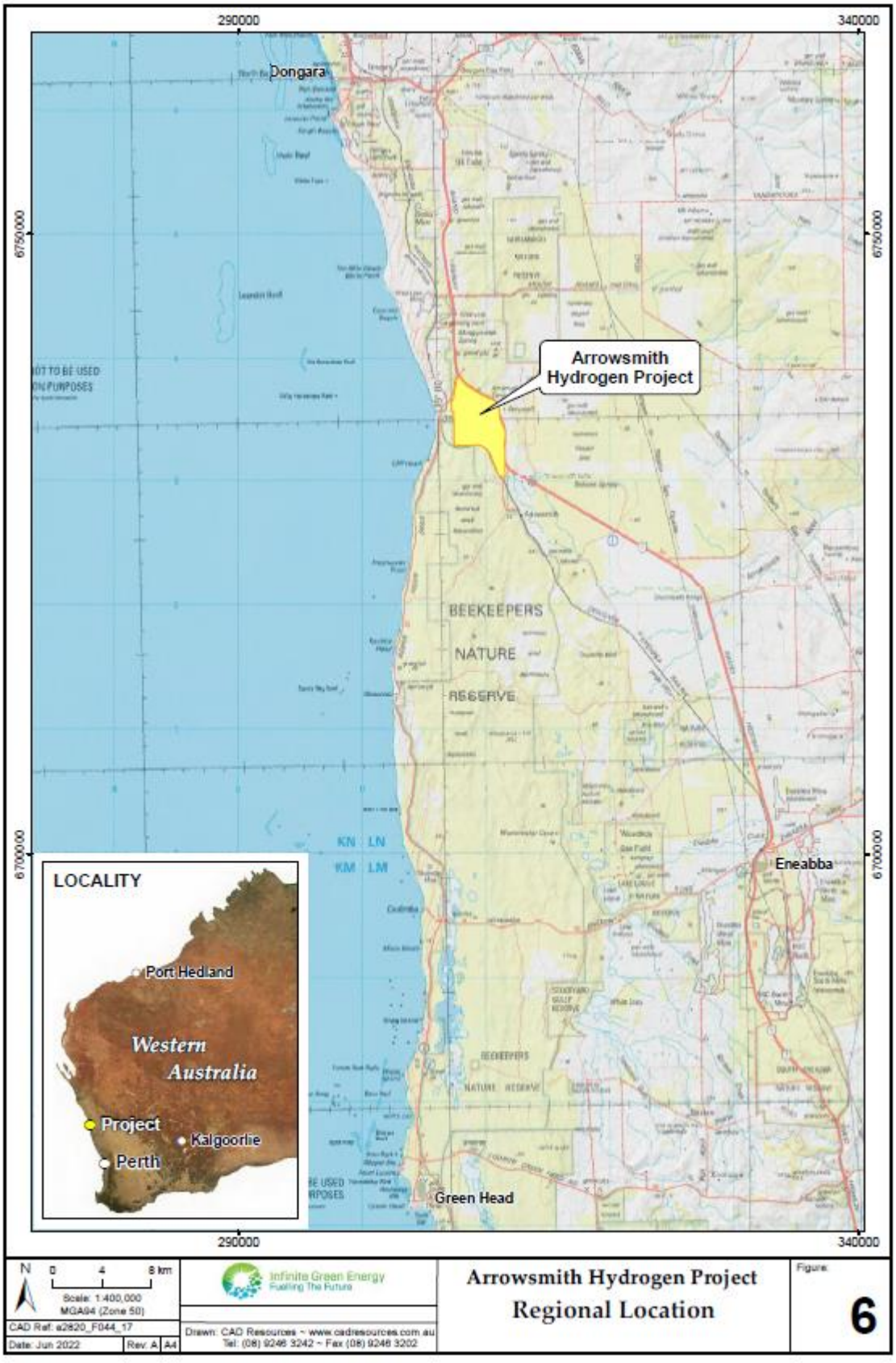

Figure 1 Construction Proponents