

Hera Resources Pty Ltd

Federation Project

Environmental Impact Statement

Chapter 10

Justification and Conclusion

10. Justification and Conclusion

The section provides a justification for the Project with consideration of market demands and the economic benefits that may be gained if the Project was to proceed. This section also provides an analysis of the Project in light of ecological sustainable development (ESD) principles, the strategic context and consideration of community benefits and impacts.

10.1 Overview

The Project involves the establishment and operation of underground gold and metalliferous mining activities, with supporting surface infrastructure, to mine approximately 6.95 Mt of ore over a period of 12 to 14 years; as well as amendments to the existing Hera Mine to facilitate mining and processing of Federation ore.

As mining at Hera Mine is expected to cease by the end of 2023, mining of the Federation deposit will allow for a transition of mining operations from Hera Mine to Federation, as ore from the Federation deposit replaces ore from the Hera Mine. The Project leverages established infrastructure at the Hera Mine to minimise environmental and social impacts, whilst still allowing for the continuation of mining operations in the region.

The net social, economic and environmental impacts and benefits are further discussed in the following sections.

10.2 Strategic Policies

10.2.1 Far West Regional Plan 2036

The Far West Regional Plan 2036 (the FWR Plan) was released by DPIE in 2017 to guide the land use planning priorities and decision making in the Far West for the next 20 years. It covers the LGAs of Walgett, Brewarrina, Bourke and Cobar.

The NSW Government established the Far West Delivery, Coordination and Monitoring Committee to deliver, coordinate and be accountable for achieving the vision and goals of the Plan. This dedicated committee comprises representatives from local government and State agencies. It works with stakeholders to align infrastructure to support growth and change in the region.

The goals of the FWR Plan are:

- A diverse economy with efficient transport and infrastructure networks;
- Exceptional semi-arid rangelands traversed by the Barwon-Darling River; and
- Strong and connected communities.

Each goal is underpinned by a number of “Directions” which outline specific actions to be implemented in order to achieve each of the three goals.

The FWR Plan identifies the LGA economic opportunities for CSC to be agribusiness, value-added manufacturing, mining, renewable energy and tourism. The FWR Plan acknowledges that distance is a constant challenge in the Far West, requiring investment in infrastructure and telecommunications to boost opportunities for the local business sectors including mining.

Despite its relatively small population, the Far West is a significant regional economy. The economy is centred on agriculture and mining, which directly contribute almost 40 per cent to the Far West's gross regional product. The FWR Plan documents the long association the township of Cobar has with mining, specifically for gold, copper, lead, zinc and silver. Direction 3 'Sustainably manage mineral resources' of the FWR Plan notes that areas of mineral and energy resource potential should be protected through local land use strategies and LEPs. The FWR plan also states that "there is potential for further development in the area". A sustainable mining sector in the region continues to generate direct employment and provides flow-on benefits to communities.

Direction 3 of the FWR Plan also outlines the need to plan for future water and energy demands to support new and emerging mining opportunities. The Project has been designed to minimise the need for water take through utilising groundwater from underground mine workings and the installation of groundwater production bores. The Project will also generate its own power supply through its onsite power plant which will be supplemented by the proposed solar farm.

Technical studies to support the EIS have been prepared which confirm the Project is aligned with the objectives of the FWR Plan. The Project is directly relevant to sustainable management of mineral resources. The SWIA concluded that impact to local catchments will be minimal, comprising a reduction of less than 1% of the respective pre-development catchments, and the Project will not be subject to regional or localised flooding. The GWIA concluded that, with the exception of two landholder bores, impacts to groundwater resources were within the Level 1 minimal impact considerations for less productive water sources in the NSW AIP. An assessment of GHG emissions for the Project identified that the use of a solar farm to supplement site power would reduce emissions by 62,060 t CO₂-e over the life of the Project.

As identified in the EIA, the Project will result in positive economic outcomes and will provide for ongoing employment. The Project can therefore be considered consistent with the abovementioned directions and goals of the FWR Plan.

10.2.2 Cobar Shire Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was prepared by CSC to provide a strategic direction for the area in support of the FWR Plan. The statement was prepared by CSC who have responsibility for its implementation, however the LSPS is owned by the community.

The LSPS sets the framework for the economic, social and environmental land use needs over the next 20 years. The LSPS gives effect to the FWR Plan, implementing the directions and actions at a local level. The LSPS planning priorities, directions and actions provide the rationale for decisions about how land will be used to achieve the community's broader goals.

The LSPS states that "*The longevity of the village (Nymagee) relies on current and future mining activity*". The LSPS acknowledges that the exploration and future approval of mining operations is a key to the economic prosperity of the region. It outlines the need for an agile planning system to meet any future infrastructure and housing needs generated through continued mining. The Project is significant in its contribution to the ongoing longevity of Nymagee.

The need to attract other skilled labour into the region is also documented. The approach is to take a family-centric approach through the promotion of benefits of the lifestyle which can be enjoyed in the region. The Project is expected to attract skilled labour into the region.

10.2.3 Strategic Rural Land Use Policy

The NSW Government released the Strategic Regional Land Use Policy (SRLUP) in 2012 to better manage the conflicts arising between mining and strategic agricultural land. The management of conflicts was by “identifying any protecting strategic agricultural land, protecting valuable water resources and providing greater certainty for companies wanting to invest in mining and coal seam gas projects in regional NSW”. The SRLUP provides a strategic framework and a range of initiatives to balance agriculture and resolve development.

The SRLUP applies to mining proposals that are SSD under the Mining SEPP. All new mining developments which have the potential to affect agricultural resources or industries are required to prepare an Agricultural Impact Statement (AIS). However, this only applies to those developments located on Strategic Agricultural Land (SAL). As the Project is not located on SAL, the preparation of an AIS is not required.

10.3 Significance of the Resource

The Mineral Resource Estimate (MRE) of the Federation Deposit continues to be further defined through the continuation of exploration drilling and the commencement of the Exploration Decline Program. An update on the MRE was provided to the Australian Stock Exchange (ASX) in July 2021 (refer to **Table 10-1** below). Metallurgical tests which have previously been undertaken on the Federation Deposit confirmed the viability of producing saleable copper, lead and zinc concentrates, and gold and silver dore’.

Table 10-1 Federation Deposit MRE at 30 June 2021

Class	Tonnes (kt)	Au (g/t)	Cu (%)	Pb (%)	Zn (%)	Ag (g/t)
Indicated	1,500	2.2	0.4	6.1	10.1	8
Inferred	3,500	0.3	0.3	5.2	9.0	7
Total	5,000	0.9	0.3	5.5	9.3	7

10.3.1 Demand for Gold

The Department of Industry, Science, Energy, and Resources - Office of the Chief Economist Resources and Energy Quarterly June 2021 (Office of the Chief Economist, 2021) contains forecasts for values, volumes and prices of major Australian resources and energy commodity exports including iron ore, metallurgical coal, gold, copper, and steel.

Australia notably holds the world’s largest gold reserves and is forecast to be the highest global producer of gold in 2021. Australia is one of the top 5 global exporters of gold in 2020 based on the percentage of global imports and exports, primarily exporting gold to the United States, United Kingdom, Switzerland, Singapore and Hong Kong (Office of the Chief Economist, 2021).

The primary global uses of gold include jewellery (37%), coins and bars (24%), and global backed exchange traded funds (23%). Electronics, industrial, dental and medical uses account for 8% of the global use, with central bank reserves also constituting 8% (Office of the Chief Economist, 2021).

Global gold consumption is forecast to increase by 6.6% in 2021, as steadier gold prices and the COVID-19 vaccine rate helps to drive up sales of gold jewellery following improvements to consumer sentiment and higher household savings in places like the US, however European gold consumption is expected to remain weaker due to slower vaccines roll-outs and economic recovery efforts (Office of the Chief Economist, 2021).

Additionally, gold consumption in Russia is expected to increase from 2021 following legislation introduced in May of 2021 that allows the national wealth fund to buy and hold gold with the Russian central bank. This latest development is expected to boost gold consumption in Russia from 2021 (Office of the Chief Economist, 2021).

Global demand for gold is forecast to rise at an average annual rate of 5.8% in 2022 and 2023 largely driven by jewellery consumption from China and India subject to COVID-19, retail demand for gold bars and coins, and the official sector shifting focus from accommodative liquid assets to reserve diversification to protect wealth (Office of the Chief Economist, 2021).

10.3.2 Gold Production

World gold supply fell by 4.4% year-on-year in the March quarter of 2021, due to lower US dollar gold prices, improved economic activity, and reduced gold recycling activities. In the same period, global gold mine production grew by 4.2% year-on-year to 851 tonnes, driven by higher production primarily in Canada and Indonesia (Office of the Chief Economist, 2021).

Gold mine production in Latin America is expected to recover in 2021 following heavy losses in 2020, with production forecast to increase in Mexico (by 14% to 121 tonnes), Peru (by 15% to 100 tonnes), and Brazil (by 3.4% to 90 tonnes) (Office of the Chief Economist, 2021).

The world gold recycling supply is forecast to fall by 4.3% to 1,228 tonnes in 2021 following a disruption to gold recycling activities in India in the June quarter of 2021, due to the rise of COVID-19 (Office of the Chief Economist, 2021).

Australia's gold exports were \$6.9 billion in the March quarter of 2021, up 17% from the previous year mostly driven by increased export volumes despite a fall in gold production by 3.1% due to planned and unplanned maintenance and lower ore grades in some gold mines (Office of the Chief Economist, 2021).

Labour and skill shortages are currently the main factors impacting Australia's gold mine production, which fell by 3.1% year-on-year in the March quarter, to 75 tonnes. It is expected that production from new mines and existing mine expansions will boost gold mine production to 388 tonnes in 2022 to 2023, which will aid in meeting an expected increase in global consumption of gold as a result of increased jewellery demand, and a change to Russian legislation allowing the country to buy and hold gold with the central bank (Office of the Chief Economist, 2021).

Overall, world gold supply is forecast to rise at an average annual rate of 1.1% between 2022 and 2023 as a result of higher mine production mainly in Australia, Canada, and Chile to reach 4,890 tonnes by the end of 2023 (Office of the Chief Economist, 2021).

10.3.3 Silver Demand and Production

In 2020, global silver mine production continued a trending decline for the fourth consecutive year. In 2020 the most significant drop was incurred with a fall of 5.9%. The main countries which produce silver are Mexico, Peru, China, and Chile with Australia ranked 5th in 2020.

The decline experienced in 2020 was largely due to the global pandemic and the subsequent closure of several major producing silver countries. The balance was generated from by-product output, which was led by output from lead-zinc, copper, and lastly gold mining activities (Silver Institute, 2021).

From a regional perspective, Central and South America tallied a 13 percent decline, followed by North America at 6 percent and Europe at 1 percent. Silver mining gains were seen in Chile, up 24 percent; Spain, which grew 20 percent; Turkey at 11 percent and Australia with a 3 percent gain (Silver Institute, 2021).

Silver is used for jewellery manufacture, however, is also has widespread industrial applications due to its physical properties. Silver is used in the production of photovoltaic cell production, electronics, motor vehicles, chemical equipment and water treatment. Silver has also been recently used for medicinal purposes (Bullionvault, 2021).

Global demand for silver also decreased in 2020 by 10%, again attributable to the global pandemic. However, there is predicted to be an increase in 2021. This is attributable to the increase in global demand for photovoltaic cells and the increased uptake in electric vehicles. Led by industrial and physical silver investment, global silver demand is expected to achieve a six-year high of 1.025 billion ounces in 2021 (Silver Institute, 2021).

10.3.4 Zinc Demand and Production

Australia is ranked third globally for zinc production, being the world's number one zinc exporter in 2020. In 2020, the top 5 export destinations for Australian zinc consisted of China, South Korea, Japan, Taiwan, and Spain. Other key zinc exporters include Mexico, Peru, Canada, and the United States (Office of the Chief Economist, 2021).

Global zinc consumption is primarily driven by galvanised steel, diecasting, brass and bronze alloys, rolled zinc, and chemicals. Zinc consumption closely correlates to steel consumption due to its primary use in galvanisation, and global refined zinc consumption increased by 10% year-on-year in the March quarter of 2021. Forecasts of strong economic growth throughout the second half of 2021 are positive for zinc consumption driven by infrastructure spending. World zinc consumption is expected to grow from 13 million tonnes in 2021 to 14 million tonnes in 2023, up an average 1.6% a year (Office of the Chief Economist, 2021).

Global zinc production declined by 8.1% quarter-on-quarter but increased 6.2% year-on-year over the March 2021 quarter as production recovered from the COVID-19 global pandemic, with both China's mine production decreasing by 20% and Peru's mine production decreasing by 11% quarter-on-quarter. Global mine output was 12 million tonnes in 2020 and is forecast to rise by 1.4% per year to 13 million tonnes by 2023 as a result of increased new mine capacity investment (Office of the Chief Economist, 2021).

Zinc prices averaged \$2,806 USD a tonne during the first five months of 2021, an increase from \$1,773 USD a tonne in March of the previous year which was considered the peak of the pandemic sell off.

Upwards pressure on prices may start to ease as Peru normalises concentrate exports however there is still shortage of concentrate resulting from mining and logistics restrictions due to COVID-19 (Office of the Chief Economist, 2021).

Australian zinc export earnings are forecast to increase from an estimated \$3.3 billion in 2020 and 2021 to approximately \$3.5 billion in 2022 and 2023 based on rising production which is expected to offset lower prices. Australia's mined zinc production decreased by 5.4% from the December 2020 quarter through to the March 2021 quarter, with production decreases at all of the major Australian mines, considered mainly as a result of the wet season in Northern Australia. Australia's zinc production is expected to continue growing over 2021 and 2022, with more subdued growth through to 2023, with zinc mine output expected to increase from 1.4 million tonnes in 2020 and 2021 to 1.6 million tonnes in 2022 and 2023, as a result of expansions at major operations in Queensland and the Northern Territory (Office of the Chief Economist, 2021).

10.3.5 Copper Demand and Production

Australia is ranked second globally for copper resources, being the sixth largest mined copper producer in the world. In 2020, Australian copper exports totalled more than \$10 billion, with the top 5 export destinations for Australian copper being China (the primary global copper consumer at over 50%), Japan, South Korea, Malaysia, and Taiwan. Other key copper exporters include Chile, Peru, Russia, and Kazakhstan (Office of the Chief Economist, 2021).

Global copper consumption is primarily driven by equipment, building construction, infrastructure, transport, and industrial use. Copper consumption increased globally in the March 2021 quarter as a result of stronger economic activity and stimulus packages associated with subsidised electric vehicles and renewable energy generation and transmission, where copper is a key component in electric vehicle manufacturing, batteries, and grid infrastructure. As a result, total world consumption is forecast to reach 27 million tonnes in 2023, up an average 3% a year (Office of the Chief Economist, 2021).

Global copper production was considered stable throughout 2020, with mine production increased by 2% in the March 2021 quarter primarily constrained by interrupted production in Chile and Peru. Other constraining factors including political instability, supply chain issues, and tax arrangements are also considered driving forces of fear of copper production shortages over the medium term. However, mine production is forecast to reach 25 million tonnes in 2023, up an average 6% a year on 22 million tonnes in 2021 and is likely to be able to overcome these issues (Office of the Chief Economist, 2021).

Global copper prices reached an all-time high of \$10,720 USD a tonne in May 2021 as a result of recovering consumption levels, expectations of future consumption growth, and low stock level propelled prices. Prices are expected to retreat from current high levels, although remain high in 2021, supported by a market deficit and these high prices are likely to influence production growth and shift consumption away from copper through increased use of aluminium and recycling rates (Office of the Chief Economist, 2021).

Australian export earnings for copper in 2020 to 2021 are estimated to be \$12 billion, which is 17% higher year-on-year and are likely to stabilise around \$12-13 billion in 2022 and 2023. Copper export volumes are expected to fall in short-term however capacity upgrades currently under consideration provide upside potential through to 2023, overcoming expected falls in 2021.

Production is likewise expected to fall marginally in 2021, impacted by lower ore grades and processing rates at a number of sites however mine expansions and new capacity investments are likely to lead to gradual production increases. Production in 2022 and 2023 is forecast to reach 910,000 tonnes, up an average 2.2% a year on the estimated 871,000 tonnes in 2021 and 2022. Copper exploration also reached \$103 million in the March 2021 quarter, up 31% quarter-on-quarter and 8% year-on-year, mainly attributed to a strong uptick in expenditure in Western Australia, which currently accounts for approximately 40% of Australia's total copper exploration expenditure (Office of the Chief Economist, 2021).

10.3.6 Lead Demand and Production

Australia is one of the largest producers of lead in the world (ranked second). China is the largest producer, with other producers in the USA, Peru, Canada, Mexico, Sweden, Morocco, South Africa and North Korea. The predominant use of lead is in the production of batteries (~80%). The remaining 20% includes underwater cable sheathing, solder, casting alloys, chemical compounds, ammunition, weighting, glassware and radiation protection. Uses for lead could increase in the future in large storage batteries used for load-levelling of electrical power and in electric vehicles. The growing popularity of electric bikes, particularly in China, has led to the e-bike now consuming more than 8% of world lead production. Since 2003, there has been an increasing trend in the price of lead, with the average price of lead in 2019 being \$3020/t which was a threefold increase from 2003.

10.4 Economic Justification

The economic justification for the Project has been informed by the Economic Impact Assessment as included in **Appendix S**.

10.4.1 Economic Growth

Hera Mine is one of the main industries in proximity to the township of Nymagee. The Hera Mine is approved for operations until December 2025, however operations are expected to cease at the end of 2023 based on current market assumptions and known mineral resources. This discontinuation of mining would have a negative impact on the township of Nymagee as well as the wider local communities of Cobar Shire.

The Project would provide positive economic outcomes through the continuation of an operational workforce with higher workforce numbers, and continued support of local businesses and the community.

10.4.2 Employment and Incomes

The Project will provide:

- An average annual construction workforce of 100 during the peak year of construction, with 10% assumed to already reside in the local area; and
- An average annual operational workforce of 200 per year over the life of the Project, with 15% sourced from the local region.

The total annual impact of the peak year of construction on the regional economy is estimated at:

- \$65M in annual direct and indirect regional output or business turnover;

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- \$27M in annual direct and indirect regional value added;
 - \$16M in annual direct and indirect household income; and
 - 130 direct and indirect jobs.

The Project is estimated to make up to the following average annual contribution to the regional economy during operations:

- \$214M in annual direct and indirect regional output or business turnover;
- \$98M in annual direct and indirect regional value-added;
- \$41M in annual direct and indirect household income; and
- 350 direct and indirect FTE jobs.

Eighty-five percent of the direct operational labour force for the Project will be sourced from outside the region. This workforce will reside in the Hera accommodation village and return to their homes outside the region when off shift. Consequently, there is not likely to be any impact on housing demand and hence prices in the region.

10.4.3 Support for the Local Economy

Agricultural activities displaced by the Project relate to herding of feral goats, a low economic value activity. The small area of land impacted (approximately 92 ha), and the low economic value of the activity means that there will be insignificant regional economic impacts on agricultural activity.

Stimulus to the local area from the Project comes from both income expenditure and non-labour expenditure (operating costs of the Project after subtraction of wages). Average annual non-labour operating expenditure associated with the Project operation is \$93 million. However, approximately 33% (i.e. \$31 million per annum of non-labour expenditure) is estimated to accrue to the local area.

Economic activity in the region will also arise from the expenditure of the Project's workforce in the region. It is estimated that the Project will provide direct regional operation employment of 200 people. Fifteen percent are estimated to live in the region with the remainder being drive-in-drive-out or fly-in-fly-out workers. This latter group is assumed to have no (or very little) spending in the regional economy. Only employees that live regionally will provide wage expenditure in the region. The main sectors potentially benefitting from workforce expenditure are retail trade, food and beverage services, primary and secondary education services and health care services.

Demand for local infrastructure and services arises from the production process, as well as demands of the workforce and their families. Production demands on local infrastructure mainly relates to the use of local roads. The Project costs assume road maintenance payments to local Councils and an upgrade of Burthong Road. Hera Resources will have in place VPAs with both CSC and BSC as outlined in **Section 2.5**, therefore positively contributing to maintenance of local infrastructure.

The Project will allow for a continuation and moderate increase in the levels of employment it currently provides at Hera Mine. It will also continue to provide an accommodation village for workers. Consequently, the Project will not provide any significant additional consumer demand for local infrastructure beyond current levels.

10.4.4 Government Revenue

The Economic Impact Assessment (**Appendix S**) estimates that net production benefits from the Project (present value at 7% discount rate) that will accrue to Australia will be \$147 million comprising NSW Royalties, company tax and 81% of residual net production benefits.

The net production benefits can be further apportioned to NSW by assuming that all royalties accrue to NSW, and all Australian residual net production benefits and company tax benefits accrue to NSW based on its population share. On this basis, the net production benefits of the Project that accrue to NSW are estimated at \$70 million.

10.5 Cost Benefit Analysis

In the Economic Impact Assessment (**Appendix S**), the base case scenario involves the continuation of existing rural production in the Project area, mainly feral goat production, and the cessation of mining and processing at the Hera Mine. This base case scenario was utilised for the cost-benefit analysis (CBA).

The primary potential economic benefit of the Project is the producer surplus (net production benefits) generated, and any wage benefits to employment, nonmarket benefits to employment, economic benefits to existing landholders, or benefits to suppliers; while the main potential economic costs relate to any environmental, social, and cultural costs, including any net public infrastructure costs and loss of surpluses to other industries. Overall, the potential economic benefits and costs of the Project are considered to consist of the following:

- Costs:
 - Net environmental, social, cultural and transport related costs;
 - Net public infrastructure costs;
 - Loss of surplus to other industries;
- Benefits:
 - Net production benefits:
 - Royalties;
 - Company tax;
 - Net producer surplus;
 - Wage benefits to employment;
 - Non-market benefits of employment;
 - Economic benefits to existing landholders; and
 - Economic benefits to suppliers.

Adverse uncompensated environmental, social, and cultural impacts of the Project have been minimised through Project design and mitigation, offset and compensation measures. The cost of implementing these measures has been incorporated into the estimate of net production benefits.

The Economic Impact Assessment has estimated the net social benefits to Australia, which are expressed in net present value (NPV), which is the present value of benefits less the present value of costs. A positive NPV indicates that it would be desirable from an economic perspective for society to allocate resources to the Project, because the community as a whole would obtain net benefits from the Project. Overall, the Project is estimated to have net social benefits to both Australia (\$146M to \$242M) and NSW (\$69M to \$165M) relative to the base case, and hence is desirable and justified from an economic efficiency perspective.

10.6 Social Justification

As detailed in **Section 8.17** and included as **Appendix G**, a SIA has been prepared for the Project. The SIA states that the Project is predicted to have positive impacts to livelihoods of individuals, the cohesion of communities (principally Nymagee and Hermidale), the mental health of regional landholders, and the employment of Aboriginal people. The continuation of mining operations in the locality and the transitioning of the Hera Mine workforce would ensure ongoing employment for people in the social locality and sustain the income for their households. This employment and income would terminate if the Project does not proceed.

Community views have been sought throughout the development of the Project. Provided in **Appendix G** is a summary of community concerns, which have been raised and how these have been addressed. Potential impacts relating to traffic generation and road safety will be managed through the development of Project specific management plans and monitoring. Similarly, with concerns associated with groundwater, a comprehensive groundwater monitoring and reporting program will continue throughout the operation and post operation phase of the Project. Hera Resources will continue to maintain a community information phone number and conduct regular community updates. Updates to Project approvals, management plans, annual reports and community meeting minutes will be uploaded to a dedicated website.

Hera Resources will continue to engage with the local Aboriginal community and RAPs in relation to the preservation of cultural heritage. An Aboriginal employment engagement program will also be developed and implemented for the Project.

It is acknowledged that the Project has the potential to result in some negative impacts, however it is considered these can be managed and minimised through leveraging the strong relationship Hera Resources has with the local community and other stakeholders. Hera Resources will continue to actively participate in the local community and seek other opportunities to improve community engagement.

10.7 Suitability of the Site

The suitability of the site (i.e. the Project area) in relation to relevant objectives of the EP&A Act is discussed in **Section 6.2**, including in regard to the orderly and economic development of land. The Project is also permissible with consent under the relevant EPIs (as discussed in **Section 6.3**).

The suitability of the site is considered optimal, with existing mining operations at Hera Mine currently planned to cease by 2023. The development of the Project will allow for the continuation of mining in the local and regional area and continued use of existing and proposed infrastructure at the Hera Mine

to ensure the substantial gold-lead-zinc-copper-silver mineral deposit is extracted with minimal disturbance.

The Project has been designed to minimise impacts where possible as informed by technical studies to ensure disturbance to the surrounding environment is reduced. Additionally, with the relatively small area of land impacted and the low economic value of existing agricultural activity, there will be insignificant economic impacts on the existing land at the Federation site due to the change in use. Where impacts are still predicted to occur, mitigation measures have been proposed to reduce these impacts, so that the Project will not displace other beneficial uses in the locality.

A number of alternatives were considered throughout the development of the Project and are detailed in **Section 2.6**. Opportunities to minimise the environmental impacts and minimise the area of disturbance were adopted where feasible. This includes locating pipelines in areas of current disturbance, utilising Burthong Road instead of an internal haul road and placing new infrastructure within the disturbance footprint at Hera Mine and the Exploration Decline Program.

Upon cessation of operations rehabilitation of the disturbed areas will be undertaken in accordance with the Rehabilitation Management Plan, with the intention to rehabilitate the land to a similar land suitability and use as existed pre-mining. The site will be returned to a stable landform and rehabilitated with native woodland across the majority of the areas.

10.8 Ecologically Sustainable Development

The National Strategy for Ecologically Sustainable Development (1992) defines ESD as “using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.”

The EP&A Act utilises the definition of ESD from Part 3, Clause 6(2) of the Protection of the Environment Administration Act 1991, wherein ESD can be achieved through the implementation of a set of principles and programs. The Project has been assessed under these principles in the below sections.

In summary, the Project is consistent with the principles of ESD as it does not exploit natural resources unsustainably, it has been based soundly on economic and environmental considerations and the likely environmental impacts of the Project are well understood and predictable. Furthermore, the development does not deplete or unreasonably affect biological diversity or ecological integrity without providing biodiversity offsets, and it provides an asset for future generations on land identified by State and local government planning policy as appropriate.

10.8.1 The Precautionary Principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent said damage.

Detailed investigations relating to the geological, environmental, engineering and economic aspects of the Project have been undertaken with the aim to produce an optimal mine plan and overall Project design. The Project as it is outlined in this EIS and the supporting technical assessments, provides the current optimised Project plan, which takes into consideration all physical, environmental, social, cultural heritage and economic aspects which are required to be addressed.

The economic extraction from the Federation Deposit of gold, silver, zinc, copper, and lead will be informed by extensive engineering and geological investigations. These investigations have been undertaken with consideration of the social, cultural and biophysical studies, which have been produced to reduce areas of scientific uncertainty where there was the potential for serious or irreversible damage to environmental, social or cultural heritage values.

The mine plan and Project design has been developed through multiple rounds of optimisation, with a focus of minimising impacts to the environment with a balance of developing an economic Project. As detailed in **Section 2.6**, a number of alternatives were considered and discounted to avoid or minimise impacts. Key aspects of the Project design which has achieved these objectives includes:

- Locating infrastructure where feasible in the disturbance footprints of Hera Mine or the Exploration Decline Program;
- Use of the approved Hera Mine TSF for the placement of tailings generated from the processing of the Federation ore;
- Placement of pipelines, access tracks and gathering lines within areas of existing disturbance;
- Use of Burthong Road instead of the development of an internal haul road, therefore reducing the amount of vegetation clearance required;
- Optimisation of the mine design to minimise any potential surface subsidence; and
- Focus on re-use of water where possible.

The result is that for all potential impacts, no serious or irreversible harm will occur to the environment. Therefore, the Project addresses the precautionary principle, as there will be no serious or irreversible environmental damage.

The technical assessments were prepared by qualified and experienced technical specialists relevant to their field. A number of the studies were prepared by consultants with a long history of undertaking impact assessments in the local area, thereby reducing the level of uncertainty. The GWIA was also independently peer reviewed by a highly experienced hydrogeologist. The potential implications of the Project have been understood through the contents of this EIS and accompanying appendices. The management strategies, mitigation measures and monitoring activities required to ensure potential impacts are appropriately minimised has also been documented.

10.8.2 Inter-Generational Equity

Inter-generational equity refers to the principle that the current generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.

Overall, the Project would provide positive economic outcomes through the continuation of an operational workforce with higher workforce numbers, and continued support of local businesses in the Nymagee area. Contributions to the NSW government from the Project from royalties and taxes will also contribute to public infrastructure and services for future generations.

Potential impacts to cultural heritage have been assessed in consultation with Aboriginal stakeholders and mitigated through the relocation of infrastructure.

The environmental, social, cultural and economic impacts of the Project are described in this EIS. The Project has proposed mitigation measures to manage impacts, and proposed biodiversity offsets for residual impacts. The Project is not predicted to result in significant residual impacts.

10.8.3 Conservation of Biological Diversity and Maintenance of Ecological Values

The third principle of ESD states that the conservation of biological diversity and ecological integrity should be a fundamental consideration in development applications. The potential environmental impacts of the Project have been detailed throughout this EIS, with mitigation measures and proposed offsets described.

The Project has been the subject of a thorough ecological assessment as detailed in **Section 8.6** and as informed by the BDAR contained in **Appendix K**.

10.8.4 Improved Valuation, Pricing, and Incentive Mechanisms

The final principal details that environmental factors should be included in the valuation of assets and services.

This Economic Impact Assessment for the EIS provides a CBA that values all material costs and benefits associated with the Project (**Appendix S**). The CBA assesses the benefits of the Project (net production benefits to society (including royalties, company tax and net producer surplus), and any economic benefits to existing landholders, workers, and suppliers); against the costs of the Project (including environmental, social, and cultural impacts, and net public infrastructure costs). Therefore environmental, social, and cultural factors have been included in the valuation of the Project. The resulting CBA provides an estimate of the Project's economic value and justification, as discussed in **Section 10.5**, and concludes that the Project is desirable and justified from an economic efficiency perspective.