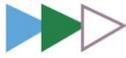


# QMDC Submission on the Ironbark Project



## Queensland Murray-Darling Committee Inc. Submission on Draft Terms of Reference for the Ironbark Project EIS November 2011

### Submission to:

The EIS Coordinator – Ironbark Project  
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This submission is presented by the Chief Executive Officer, Geoff Penton, on behalf of the Queensland Murray-Darling Committee Inc. (QMDC). QMDC is a regional natural resource management (NRM) group that supports communities in the Queensland Murray-Darling Basin (QMDB) to sustainably manage their natural resources.



Funded by:





## Actions sought

### 1.1 1.4.1 Methodology of the EIS

QMDC submits that the proponents need to include a description of what steps the project has taken to consider relevant regional planning instruments such as Regional NRM Plans and Regional Growth Management Strategies, (refer to 1.4.1 at p.3 & 1.6.2 at p.5 of the Draft TOR). Consideration of these regional planning instruments is required to align the EIS methodology to relevant regional planning mechanisms.

QMDC asserts that it is essential the methodology of the EIS sits within a legislative framework that clearly articulates the cumulative upper and lower limits for changes to natural resource asset condition and function in defined zones and timeframes to protect the integrity, health and value of the asset, and productive capacity, of those zones. Exceeding such limits would not be permitted under any circumstance, and would be an offence to do so.

### 1.2 1.5 Public consultation process

Community engagement, disclosure of information and public consultation must meet community expectations for a more enduring and direct role in the planning, decision-making and implementation of natural resource policies and activities as they relate to the Project.

This process still needs improving to ensure timely and adequate notification of the Project's activities and development, particularly to individual landholders, local governments and communities where the development has the potential to impact on the planning and resourcing of supporting infrastructure, services and land use e.g. farming, Industrial and residential zoning, waste management, sewerage management, roads, infrastructure, services (health, police, schools), airports, and emergency services.

QMDC seeks public engagement that is timely, meaningful and relevant and conducted appropriately for each stakeholder in order to *encourage and facilitate active public consultation* (refer to 1.5 at p.4 of Draft TOR). This also includes public notification and consultation for any proposed changes to Environmental Management policies or authorities from that initially agreed to by the State government. Resourcing a regional Advisory Committee to advise the State government on proposed projects and their TORs, EISs would advance the public consultation process. This Committee would need to be appointed by the region's communities to represent key regional stakeholders including local landholders.



### **1.3 1.6 Project approvals**

QMDC submits that relevant international protocols, strategies, policies or legislation pertinent to CSG mining development and activities should also be referred to. Additionally public access to the Project's TOR and EIS should be readily available, on government and company websites.

### **1.4 2.1 Project justification**

Justification for the Project must highlight how that Project will safeguard natural resource and community assets and values, and traditional or potential economic opportunities in the region in the short to long term, rather than from the short to medium term of a project. Any discussions pertaining to the *status of the project in a regional, state and national context* must be analysed in context of the Project's potential harm and contribution to the cumulative impact on region, state and country, for example, an increase in:

- air pollution
- soil erosion
- greenhouse gases
- contaminated sites
- degradation of groundwater
- disturbance of farming land
- diversion of surface waters in a floodplain
- thermal pollution
- water consumption
- waste (refer to 2.1 at p.6 of Draft TOR).

QMDC would like detailed terms to be included in the TOR to require the proponent to justify:

- why having either one or two gas plants is required for the Project.
- whether the sales gas pipeline dug to the minimum depth of cover, as required by *AS2885 Pipelines –Gas and Liquid Petroleum* is the best practice in terms of the Project landscape features and soil conditions.

### **1.5 2.2 Alternatives to the project**

QMDC seeks a description of a feasible alternative to the proposed Project that addresses the key components of sustainable development (environmental, social, economic, governance), and which can be applied to the region in which the proposed Project will impact upon both directly and indirectly.



QMDC seeks an environmental audit and comparative analysis of the Project's estimated contributions to the State's economy to ascertain the Project's contribution to increases in greenhouse gas emissions, waste production, road damage, vegetation and biodiversity loss, air pollution, water and fuel consumption etc., and the financial burden this potentially places on future generations and government. Does the benefit to Queensland from royalties to the State reflect a true economic gain?

Challenges associated with economic growth created by the CSG industry require more in depth economic analysis in relation to potential and long term impacts on natural resources, social infrastructure and local economies.

If pressures on local and regional infrastructure are clearly identified regions will need to define what is considered appropriate new infrastructure based on social needs and environmental factors such as water quality, risks of salinity, impediment to natural water flows, floodplain risks, threats to the region's biodiversity etc.

The *Initial Advice Statement* identifies plans for extensive new infrastructure. The TOR must pay serious attention to the cumulative impact of this infrastructure especially in light of the impacts experienced in the regions during recent 2010/2011 flood events.

QMDC recognises the need to address cumulative impacts, changing social dynamics and health issues more thoroughly as part of the assessment of alternatives.

Additionally the limitation of water resources must be recognised within an environmental best practice framework that takes into account social and economic factors. The DERM CSG water management policy referred to in *the Initial Advice Statement* is currently being updated. The options for CSG water disposal therefore need to be reconsidered with reference to the updated policy. To date appropriate solutions for the reuse of CSG water are not scientifically or technically proven and indeed much of that water may end up creating contaminated sites. A full cost environmental accounting of CSG water disposal requires social and economic issues to be addressed.

In assessing how to 'optimise', not simply "**maximise**" opportunities, the TOR should require the proponent to identify risks that may impact on the natural resources of a region, its communities and other industry and in response to those risks implement risk management strategies. QMDC recommends that the TOR should require a whole life cycle analysis of CSG associated water and its by-products. QMDC asserts the proponent needs to demonstrate how the Project will "**optimise**" gas and water production striving for a balance between a range of key factors such as water quality and availability, soil health and land capability, biodiversity and vegetation management. This may mean for example during periods of wet weather where storage and disposal options may be limited, caps on water production may be necessary in order to avoid any discharge of untreated CSG water and to optimise beneficial uses of treated CSG water.

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Regional planning must address feasibility issues with specific regard to the disposal of CSG water and “by-products”. The TOR therefore need to demand a full analysis outlining each option and alternative, assessing infrastructure and associated industrial operations associated with disposal of “by-products” defined against specific criteria and limitations that prevent, minimise and mitigate the risks associated with the storage, transport, destination, and cumulative and long-term impacts of such volumes of waste. QMDC is concerned that the region’s communities are being forced to have an accumulation of contaminated sites or “stockpiles” of by-product to be dealt with once a future solution is found or are being subjected to untreated waste water being released for emergency disposal.

### **1.6 3.5 Rehabilitation and decommissioning**

QMDC recommends terms outlining the rehabilitation of land impacted by temporary camp sites are included in the TOR.

### **1.7 Environmental assets, values and management of impacts for land and water**

ACAs and AquaBAMM products can be used to guide environmental values assessments and management impacts. This will assist natural resource management practices when the QMDB AquaBAMM is released. QMDC supports the productive use of aquatic biodiversity assessments in the context of the Project’s operations.

QMDC submits that independent access is needed to the proposed Project’s water monitoring data and that it links to the development and conformity to local water quality guidelines.

QMDC asserts the TOR must require the Project to describe and outline how it will take into account:

- any direct disturbance to the affected catchments and associated creeks, riverine, floodplain or wetland environments, or hydrological downstream impacts by the act of discharging waste water or treated water; and
- the construction of pipelines and other infrastructure consider inherent conservation and ecological values and function in relation to:
  - in-stream flow regimes;
  - surface water flow systems (including potential contaminants such as salt, erosion, groundwater interface, barriers to movement of flow and in-stream species risks)
  - groundwater flow systems
  - riparian function (ground cover, bank stability, habitat, connectivity)
  - wetland and floodplain function



QMDC seeks additional to the description of environmental values the proponent in the TOR to identify land and water environmental assets in the Project area.

QMDC asserts the TOR must give clear instruction to the proponent on what is meant by cumulative impacts and the type of impacts that contribute to cumulative impacts (SEE *Assessing the cumulative impacts of mining on regional communities: an exploratory study of coal mining in the Muswellbrook area of NSW* (2008) at pp xvi, xvii for discussion on definitional issues).

Do the cumulative impacts referred to in the Draft TOR include the successive, incremental and combined impacts of CSG mining on regional communities, their economy and the environment that sustains them? If so then what are the different types of impact that must be studied to gain a true and accurate picture of the Project in its totality?

Are they:

- *Spatial extent impacts* those which occur over an area, e.g. the area of vegetation that has been cleared for the drilling site and its associated infrastructure, the amount of land disturbed and managed to post production use?
- *Spatial intensity impacts* where a location is impacted on by the activities of multiple sites e.g. where the emergency discharge of several upstream sites contributes to elevated levels of sedimentation in particular catchment areas?
- *Simple temporal impacts* which have a specific time of commencement and a measured form over time e.g. the amount of land contaminated over time as a reflection of the stage of development of the well life?
- *Offset temporal impacts* which occur when multiple simple temporal impacts are superimposed upon one-another over time e.g. materials moving through rivers or the extraction of water for a well, being proportional to its gas production.
- *Linked triggered impacts* which occur when one impact, either by its occurrence or by reaching a threshold level, triggers another impact that would not otherwise have occurred. The second impact is the triggered impact.
- *Linked associative impacts* occur where multiple impacts occur as a result of a single event or change, e.g. as a result of opening a new gas field, expanding a gas field or changing operations.

QMDC submits that owing to the complex nature of cumulative impacts, the TOR must provide a clear direction to the proponents on how cumulative impacts should be defined and measured. A simple typology used in the above-named 2008 study that distinguishes between spatial, temporal and linked impacts recognises that there is no one way in which impacts are cumulative and that a more differentiated approach is needed for both the measurement and management of such impacts (SEE p.17 of the above-named study).

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The information offered by the proponent needs to reflect the most accurate data to date and in a form that can contribute to the region's knowledge and State data bases and advance EA/EIS decision making processes. QMDC believes maps used in the *Initial Advice Statement* do not include scientific research data obtained by scientists contracted or employed by Origin. The TOR must require all mapping used by the proponent to justify or describe the Project to include most current data both government and its own sources.

#### **1.8 4.2.2.2 Assess impacts on good quality agricultural land and strategic cropping land**

The Project because it will occur within existing food production areas may result in a fragmented landscape with inadequate buffers. Failure to protect agricultural areas will impact on landscape features that support agricultural systems, resulting in either complete losses of agricultural uses on affected lands or diminished productivity.

QMDC submits that by focussing on existing land use the opportunity to secure strategic cropping areas that will prove invaluable as climate refugia for cropping in the future is being overlooked.

Protecting SCL and associated soils also requires the TOR to require the Project to address the need to protect water. If land achieves the versatile cropping land classification it is because of access to groundwater as well as cropping reliability etc.

The TOR must require the Project to articulate:

- why a minimum impact to SCL is acceptable
- whether an impact on water supporting SCL will trigger the proposed SCL Policy's intent to protect SCL
- what area of land or size of footprint triggers the indicator that productivity has been temporarily diminished
- at what point does volume and configuration impact on productivity
- whether creating a buffer zone to protect cropping capacity from the project's development will address other landscape impacts such as significant streams, wetlands, cultural sites etc.
- whether the site can be "**Fully restored**" back to the parameters in the original land suitability assessment and demonstrate how this is possible based on peer reviewed scientific evidence
- that there are no alternative sites
- that SCL can be fully restored back to original assessed condition as per all criteria within suitability assessment;
- the proposal is of significant community benefit.

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#### 1.9 4.2.2.5 Landscape character

The creation of buffer zones will serve to manage landscape impacts from the Ironbark Project on urban areas, significant streams, wetlands, cultural sites etc. QMDC submits that buffer zones are dependent on types of activities and infrastructure. Distances of those buffers therefore need to be determined according to the impact of that activity and infrastructure on flora and fauna whether it be noise, lighting, dust, vibrations, traffic, erosion etc.

Direct disturbance to riverine, floodplain or wetland environments, or hydrological downstream impacts caused by the construction or location of infrastructure can be minimised by establishing and managing buffer zones.

QMDC submits that as a general rule, buffer zones should exclude development from within a defined buffer zone for waterways appropriate to stream order and defined buffer zones upstream from and including wetlands.

The TOR therefore should require the Project to outline what buffer zones will be included in construction design and within the operational plans of the Project.

QMDC asserts priority landscape scale regional ecosystems should be maintained or improved so that ecological processes and ecosystem linkages are increased in extent and abundance at priority catchment scales.

QMDC submits that the decline in populations of 'at risk' flora and fauna species must be prevented. It should not be assumed fauna can be removed to another ecosystem if found where vegetation is to be cleared and that birds will simply fly away to somewhere else if disturbed by noise, dust etc. The TOR therefore must require the Project to demonstrate scientific understanding of the importance of remnant vegetation and preventing further fragmentation or destruction of ecosystem corridors.

QMDC submits that destroying habitat before equivalent habitat has been restored increases the risk of species extinction. Additionally, species need time to colonise a restored habitat, and too frequent a turnover of habitat may increase the risk of species extinction.

QMDC submits that the long term conservation of biodiversity and the wellbeing of the region's communities depend upon both the protection of natural assets and maintaining the integrity of the ecological processes that sustain them. A focus on process recognizes that ecosystems are temporally and spatially dynamic and that the components of ecosystems interact in complex and diverse ways that contribute to, and sustain biodiversity. Processes may also act as selective forces to which particular species are constantly adapting.

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QMDC recommends that the TOR require the Project to demonstrate through a *Terrestrial ecological environmental plan* (TEEP) must an understanding that modification or destruction of ecological processes are, in practice, often irreversible and an ecosystem will not necessarily rehabilitate to its prior function.

QMDC submits that the TOR must ensure that the TEEP must not fail to respond adequately to the complexities in the ways in which threats affect ecological processes and regional ecosystems. For example:

- Impacts may occur far from the location of the initial threat or disturbance.
- Threats that affect one species may have cascading effects on other species.
- Environmental responses to a threat are not necessarily directly proportional to the level of threat (i.e. a linear response). Non-linear responses mean there are critical thresholds where small increments of change can result in dramatic shifts in the state of the system.
- There is often a time delay, from days to decades, between alteration to an ecological process and its full effects on biodiversity.
- Threats may have a combined impact greater than their independent effects.
- Complexities in interrelationships among species and chance environmental variation may mean that often there will be uncertainty about the effects of a particular threat on processes.

QMDC submits that studies are required to ascertain which processes have the greatest influence in the project development areas their role, the spatial extent over which they operate, the kinds of threats that are limiting their function. This will assist the TEEP to direct its management strategies where it will have the greatest impact.

A fundamental tenet of regional ecosystems is recognition of the interaction between pattern and process. The identification and management of locations directly associated with a specific process is a practical way for the projects to protect regional ecological processes. Examples in the Project development area could include:

- Protecting floodplains adjacent to river channels to maintain lateral hydrological connectivity and the ecological benefits of periodic flooding.
- Maintaining continuous vegetation along elevational gradients to enhance opportunities for altitudinal migration or range shifts in a changing climate.
- Protecting key wetlands along the migration paths of water birds as critical stops for refueling.
- Maintaining riparian vegetation to promote interactions between terrestrial and freshwater systems.
- Protecting “keystone” such as small ephemeral streams and wetlands to aid the re-establishment of ecological process in restoration.

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QMDC asserts that the TOR must address the following matters:

- the operations of the Project will not be permitted to impact on high-conservation areas
- that land is allocated by the projects for habitat connectivity to allow species to move as climate zones change
- the construction of infrastructure not be approved until a detailed site investigation is carried out and an official map modification is approved as per the Queensland Herbarium process giving accurate details of the regional ecosystem and its biodiversity
- the Project identifies the processes that are most important in sustaining the regional ecosystems or species in their development areas
- the Project establishes a long term monitoring program to measure environmental change and generate information on:
  - The direction and magnitude of change( taking into account natural fluctuation)
  - The rate of change
  - The pattern of the change response

A complete EIS will ensure Origin takes into consideration matters of regional significance as indicated by the regional NRM Plan and the pending Aquatic Conservation Assessment (ACA) and the Healthy Waters Management Plans (HWMPs) currently being developed for the Condamine-Balonne and Moonie Catchments.

Examples of matters of interest from the NRM Plan will include Water Quality, Wetland health, Regional Ecosystem extent and connectivity, soil erosion and salinity and other key interest areas. A fully considered regional assessment of impacts both site specific and cumulative impacts caused by small-patch and larger landscape scale clearing, must be conducted by Origin to avoid further fragmentation of the landscape. Offsets, at an absolute minimum, should achieve no net loss and should require the re-establishment of vegetation to an equivalent condition and not simply protect existing vegetation.

The ACA provides mapping of the conservation value of riverine and non-riverine wetlands and would therefore inform the EIS with regard to Undulla Ck and the palustrine wetland indicated in Origin's aquatic ecological report. The ACA includes the data that identifies which aspects of mapped wetlands contribute to the conservation values.

HWMPs will identify values associated with water and wetlands and indicators with guidelines for normal/acceptable ranges of readings for these indicators in different "water type" areas in the CB and Moonie catchments.



## 1.10 4.5 Water

QMDC is assisting with the development of local water quality guidelines under Queensland EPA legislation. The idea of these guidelines is to:

- ascertain the values for surface and groundwater in the catchment – i.e. why do we care about water quantity and quality – social, economic and environmental interests
- determine what indicators we might use to determine if these values are being met, and
- from available data nominate some objectives that will ensure values are protected into the future. These objectives are likely to be in the form of an acceptable range of values, or guidelines, for selected indicators based on historic data and available scientific knowledge.

QMDC submits that the proponents need to be involved in the development of these guidelines because the aim is that they will be entrenched in legislation and will be required to be referenced and utilised in TOR and the EIS. They will also guide future Environmental Authorities for all industries including coal mining – i.e. they will replace the current default water quality guidelines for South East Australia.

CSG companies represent a significant industry group in the catchments with interests in water. They therefore have the capacity to contribute to the determination of values associated with water.

The TOR should therefore require the proposed Project to demonstrate a commitment to the development of regional water quality guidelines by commissioning water monitoring in the catchment and supporting community access to scientific expertise in water and in hydrological and hydraulic processes that influence water quantity and quality. The data and expertise would add value to the determination of indicators and to the development of objectives and the resulting guidelines.

Ideally the development of guidelines should include input from a collective group of CSG mining representatives and should provide an opportunity for this industry group to share their knowledge and influence ongoing development with a mind to sustainability.

QMDC as an advocate for community and industry groups in the QMDB is keen to facilitate CSG mining companies' input into this process and submits TOR can play a valuable role in facilitating an integrated industrial approach to regional water quality.

In many areas where CSG production occurs, comprehensive baseline data is not available. This is essential for adequate assessment of potential impacts to aquatic ecosystems.

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QMDC submits that it should be a mandatory requirement that all CSG companies use a set monitoring and data collection methodology that is independently reviewed and regularly evaluated against community values and regional guidelines on, for example, water quality. Raw data and methodology should be made public per evolving water data transfer protocols as they progress under the federal and state legislation. This should assist in filling gaps in the identified need to have baseline data as per the above paragraph.

Monitoring plans are integral to EMPs and seem to be well developed albeit with some detail from DERM often being required in the EA application process. However there is no evidence of independent access to monitoring data or of links to development and conformity to local water quality guidelines. The plethora of data currently being collected by CSG companies dwarfs the currently available public data used for assessing norms and for water quality and aquatic ecosystem health condition and trend assessments.

The TOR therefore should require the Project to demonstrate a procedure for collecting water quality data that require public disclosure of monitoring data in real time.

Undulla Creek and Humbug Creek belong to the Undulla catchment, the Wieambilla and 26 Mile Creek belong to a different catchment, the Lower Balonne Condamine – therefore 2 catchments will be affected by the Project.

In the Undulla catchment, the small palustrine wetland the Project refers to is actually listed as a 'Nationally Important Wetland' under DIWA (Directory of Important Wetlands in Australia). It is not actually listed as a reserve yet – but QMDC believes DERM are currently engaged in the listing process. The EPA Wetlands website lists industrial development as definite threat to the integrity of this system.

In the new Aquatic Conservation assessment tool, created by DERM there are many sections of the Condamine River, which these two catchments flow directly into, that are listed as being of very high conservation value. Additionally, in the Undulla Creek catchment, there are several smaller wetlands not connected to the main channel that are also listed as being of high conservation value.

#### **1.11 4.6 Air**

QMDC submits that regional air quality issues must be analysed in relation to the cumulative impact of:

- all operations of the proposed development area
- all operations of the energy and mining industries; and
- all other regional industries such as agriculture, power plants, transport services etc.



Control measures described in the TOR must indicate how the Project will put in place regular and ongoing monitoring rather than merely promote monitoring on a complaint basis only.

The Project's control strategies to deal with adverse weather conditions before construction activities require serious consideration and should be articulated clearly within its *Air Management Plan*. The TOR need the Project to identify areas where construction can not proceed because of risks associated with climate change and variability.

The TOR must require the Project to outline what:

- specific baseline air quality monitoring over the development area will be conducted;
- regular and ongoing air quality monitoring throughout construction phase and during its operation will be conducted;
- independent monitoring they propose for all operations to ensure transparency and accountability to local and regional communities;
- monitoring data will be made public and in what format so that it conforms to the goals of the Environmental Protection Air Policy 2008 and allows public access and independent review of local and regional conditions and trends;
- will be done to ensure monitoring and management plans are consistent (including units of measure), within the defined asset, and across CSG industry operations and how they will report against site, total and cumulative thresholds; and
- areas are there where infrastructure should not be constructed because of risks associated with risks to human health and in relation to climate change and variability.

#### **1.12 4.7 Noise and vibration**

Studies of the complaints databases from five of the coal mines in the Muswellbrook area highlighted that there were a number of noise and vibration complaints and issues made by affected local residents. (SEE *Assessing the cumulative impacts of mining on regional communities: an exploratory study of coal mining in the Muswellbrook area of NSW* (2008) at pp 32 -33).

These ranged from:

- general plant and operational noise, e.g. noise from the plant operations at mine-site, including washery noise, CHPP, draglines
- noise from trains, shunting , loading or related
- beeping – reversing-alarm noise

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- general operational noise, e.g. all noise emanating for the mine site operation that was not plant specific or traffic or train related
- noise related to traffic, e.g. excessive operational truck noise such as braking, acceleration or traffic noise
- blasting noise, blasting fumes
- overpressure air noise/vibration
- ground vibration

QMDC submits that the TOR needs the Project to identify clear timeframes to record accurate baseline information for monitoring purposes.

### **1.13 4.8 Ecology**

QMDC is concerned that the Aquatic Ecology - the AIS (2.8.1) gives a negative impression, based on assumptions, about the riparian areas associated with agricultural land uses. The water quality guidelines that the proponent proposes to use (EIS 4.5.1 p22) are more relevant to permanent (usually coastal) waterways ie streams in this region if gauged against the proposed guidelines to be used usually do not come up with a very good score. QMDC asserts gauging stream health against standards more relevant to the QMDB is essential. QMDC would like to avoid a perverse outcome that allows the EIS to say that the streams are already degraded so what further impact the Project may have does not matter.

Any impacts to groundwater and surface water must be managed to protect aquatic ecosystems which are comparatively vulnerable in the QMDB, and the Great Artesian Basin (GAB). QMDC submits that the TOR should require the Project to demonstrate the sustainable use of GAB water and its waterways to ensure that aquatic ecosystems are protected as important natural resources.

Origin's exercise of water "rights" must be tenable in terms of the long term sustainability of the region's natural resource assets.

The Project must provide assurance and certainty that impacts on aquifers, waterways and their aquatic ecosystems will be avoided wherever possible and well managed or mitigated whenever necessary.

A fundamental tenet of regional ecosystems is recognition of the interaction between pattern and process. The identification and management of locations directly associated with a specific process is a practical way for the projects to protect regional ecological processes.



The TOR must include a description of how the Project will:

- protect floodplains adjacent to river channels to maintain lateral hydrological connectivity and the ecological benefits of periodic flooding.
- maintain continuous vegetation along elevational gradients to enhance opportunities for altitudinal migration or range shifts in a changing climate.
- protect key wetlands along the migration paths of water birds as critical stops for refuelling.
- maintain riparian vegetation to promote interactions between terrestrial and freshwater systems.
- protect “keystone” natural resources such as small ephemeral streams and wetlands to aid the re-establishment of ecological process in restoration.

#### **1.14 4.12 Economy**

QMDC submits that the State Government needs to secure a significant bond or proportion of royalties for implementation of the Project to safeguard against risk associated with the collapse/abandonment of companies and/or the industry. This security must consider the loss of rates, and increase of costs to local governments for management of infrastructure, resources and services as a direct result of mining and energy industry development. The security must also be considerate of the unique issues of smaller rural and residential holdings and the compounded impact to communities and natural resource values of the area.

Additionally a pre-determined percentage of the royalties received from the CSG industry should be invested in natural resource management within the originating region.

QMDC submits the proponent should not be allowed to claim the “commercial-in-confidence nature of financial assurance” and should be required to disclose to regional communities how they will fulfill this obligation adequately. Will for example, the proposed Project’s financial assurance take into consideration the impacts of climate change and variability on the Project? Will the financial assurance factor possible impacts caused by economic recession, both local and global? Will it address global crises such as world food shortages and the cumulative impact on permanent alienation of strategic cropping land? Will it adequately address natural resource management contamination risks?



## **1.15 Recommendations**

### **1.15.1 That the TOR includes all the above recommendations and a full assessment of the impacts caused by:**

- 1) the operations and infrastructure of the Ironbark Project on high-conservation areas**
- 2) land clearance on habitat connectivity and species movement including movement as climate zones change**
- 3) the construction of infrastructure on the regional ecosystem and its biodiversity**
- 4) environmental change and in response generate information on:
  - a) The direction and magnitude of change (taking into account natural fluctuation)**
  - b) The rate of change**
  - c) The pattern of the change response****
- 5) groundwater extraction on Ramsar listed wetlands and feeder streams**
- 6) pollutant concentrations and discharge volumes**
- 7) disposal and storage of CSG water “by-products”**
- 8) prolonged emergency CSG water emergency disposal**
- 9) drilling, fracking and repatriation activities to groundwater quantity and aquifer and aquaclude integrity**
- 10) the operations and infrastructure of the Ironbark Project on the aquatic ecosystems of the QMDB as determined by the associated documented conservation values**
- 11) direct disturbance to streams and associated riverine, floodplain or wetland environments, or hydrological downstream impacts by the act of discharging treated water and the construction of pipelines and other infrastructure consider inherent conservation and ecological values and function by taking into account:
  - a) in-stream flow regimes****

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- b) surface water flow systems (including potential contaminants such as salt, erosion, groundwater interface, barriers to movement of flow and in-stream species risks)**
- c) groundwater flow systems**
- d) riparian function (ground cover, bank stability, habitat, connectivity)**
- e) wetland and floodplain function**

**1.15.2 That the TOR require THE Project to demonstrate independent monitoring for all of the Ironbark Project operations to ensure transparency and accountability to local and regional communities. That monitoring data must be made public in a format conforming to national water data management protocols to allow public access within real time. Additionally independent review of local and regional conditions and trends should be required. That Origin's monitoring and management plans are consistent (including units of measure), within the defined asset, and across CSG industry operations and that they report against site, total and cumulative thresholds.**

**1.15.3 That a cumulative impact assessment be done to illustrate the totality of impact caused by the total footprint of Origin's operations and activities.**