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APPENDIX 4

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Managing Cumulative Impacts in Mixed-Industry Regions

Isaac Region (Bowen Basin) Case Study
Queensland

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1. Context

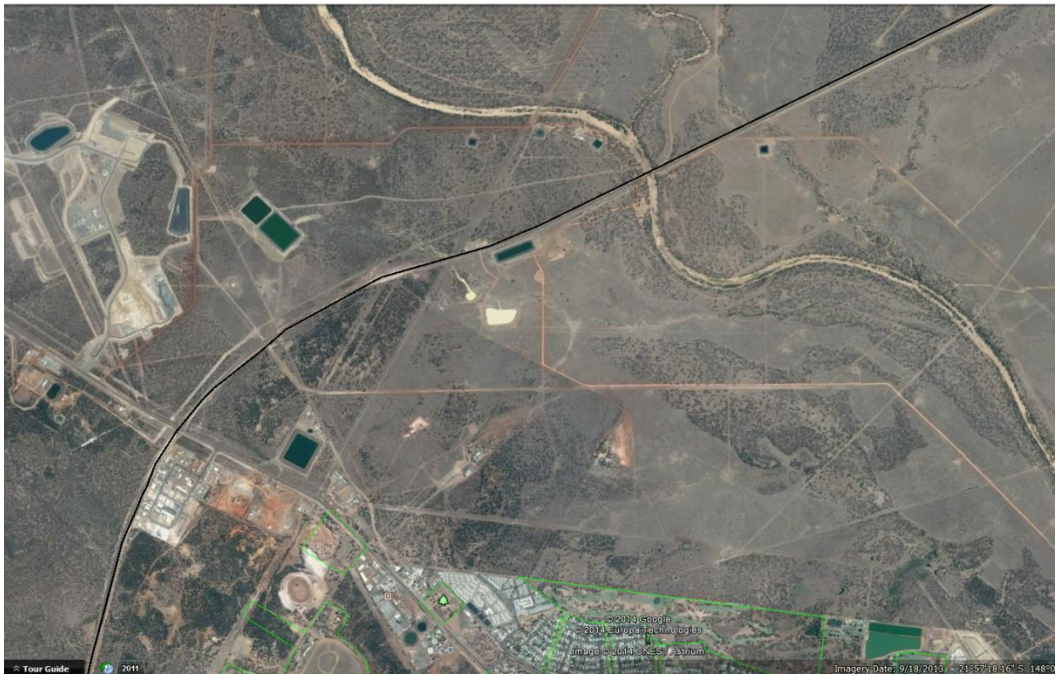
This report presents a case study of the application of recent initiatives and measures intended to manage cumulative impacts of coal-mining in the multi-industry Bowen Basin. The Isaac Regional Council (IRC) and its administrative centre of Moranbah were selected as the focus for this case study.

1.1 A brief overview of Bowen Basin, IRC and Moranbah Town

The Bowen Basin region, located in Central Queensland, contains the largest known coal reserves in Australia. The basin extends from Collinsville (North) to Theodore (South) through four Local Government Areas (LGAs): Whitsunday Regional Council, Isaac Regional Council, Central Highlands Regional Council and Banana Shire Council.

The Bowen Basin is well-known for its coal resources. According to the Department of State Development, Infrastructure and Planning (DSDIP) in 2013 the Bowen Basin's 56 operating mines (43 open-cut and 13 underground operations) produced 206 million tonnes of saleable coal (DSDIP, 2014). It is expected that additional mining development will be realised in the Bowen Basin in the future and the Queensland government is currently considering an additional 60 coal projects (at varying stages of development) in the Bowen Basin. Due to the significant coal extraction activities occurring within the Bowen Basin, the Regional Australia Institute (2013) suggests that the economic diversification of the Bowen Basin is quite low (ranked 540/ 563 within Australia). This concentration in extractives will not ease when the CSG industry commences production in the region in the near future. Geoscience Australia and BREE (2012) suggests that 23% of Australia's identified CSG reserves are in the Bowen Basin and the recent expansion of CSG drilling within the Bowen Basin reflect this.

Figure 1: Aerial view of Moranbah and nearby mixed land-uses (coal mines; agriculture; built infrastructure; Isaac River, timbered and cleared areas; exploration drilling)



Source: Google Earth, Imagery date 18/9/2013 21° 58'33.49"S 148°02'42.17"E; Eye Alt 8.09km

Reflecting the main land uses, the economy of the IRC in the Bowen Basin is dominated by mining and agriculture (Figure 1). IRC's mining produces 47% of Queensland's total saleable coal and generates $1.1 billion in royalty payments per year (IRC, 2014a). As at June 2014, the IRC hosted 25 operating coal mines, with a further two under construction and 27 in advanced development phase (IRC, 2014a). Five of these mining operations are within a 20 km radius of Moranbah where a further five mining projects are among those in the process of obtaining government approval. Agriculture is the second major industry with the gross value of agricultural production in the IRC being $302.7 million with 70% of that ($211.7 million) from livestock and the balance from crops (IRC, 2014a).

Overall, local employment is dominated by the mining sector with 2011 Australian Bureau of Statistics (ABS) Census Data (see Table 1 and Figure 2) identifying that mining constituted the highest percentage of employment (44.3 %) in comparison to other industries in 2011 within the town of Moranbah. The proportions hold across the whole LGA and are particularly skewed for 'blue-collar' workers 54.5% of whom are employed in the mining sector with a further 11.1% employed in the construction sector. Workers classified as 'white-collar' are also represented in the mining sector (18.4%) and the agricultural, forestry and fishing sectors (16%) (ABS, 2014).

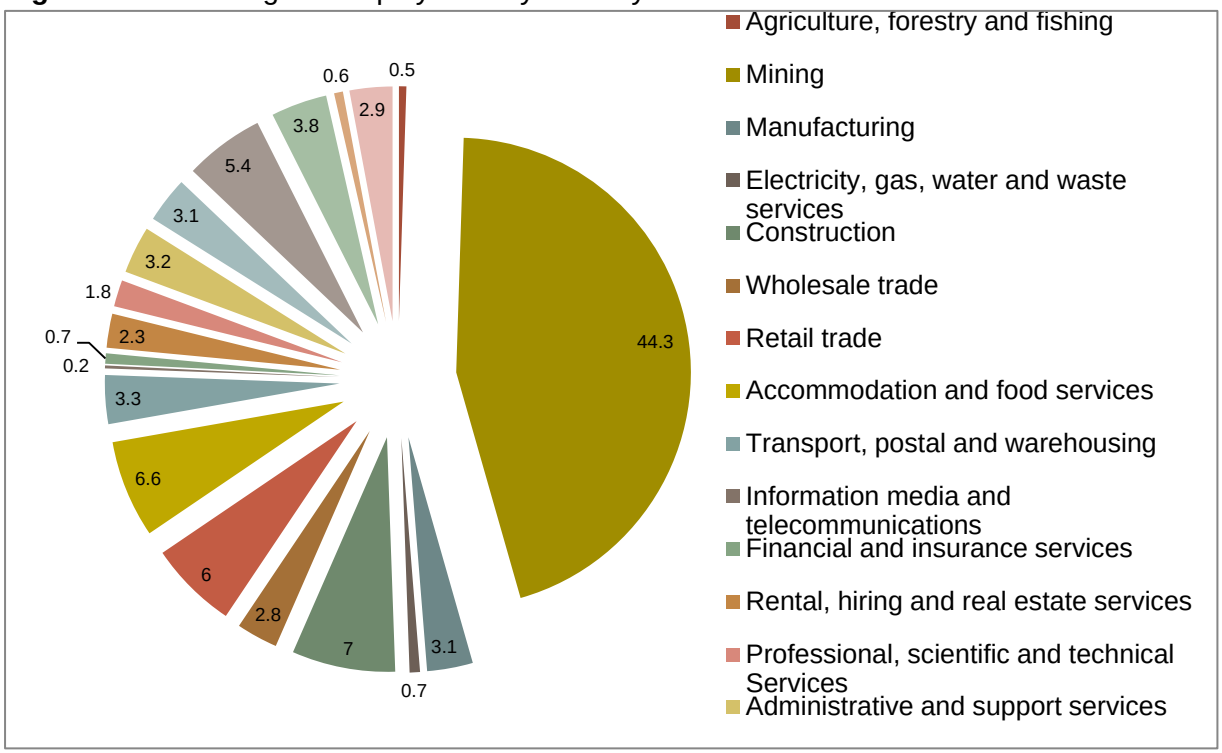
The administrative centre for IRC is Moranbah and it was originally established in 1969 to cater for coal mine workers and their families. According to ABS Census Data in 2011, Moranbah has a residential population of over 8,500. However, the estimated full time equivalent of 11,500 persons staying in Moranbah on census night shows that Moranbah hosts a significant proportion of non-resident workers (approximately 30%). The town is a service centre for multiple industries including mining (coal and coal seam gas), agriculture (crops and cattle grazing), and others such as services and quarries.

Table 1: Profile of key industries in Moranbah Town (data 2011)

Industry	Employment percentage (of total employed = 4,939)	Gross Value of production
Agriculture		$12 m
Crops	0.5	$2m
Cattle		$10m
Mining	44.3	n/a
Construction	7	
Accommodation & food	6.6	
Retail	6	
Other	35.6	n/a

Source: ABS, 2014
(http://www.abs.gov.au/AUSSTATS/abs@nrp.nsf/Previousproducts/312011341Industry12007-2011?opendocument&tabname=Summary&prodno=312011341&issue=2007-2011)

Figure 2: Percentage of employment by industry



Source: ABS, 2014
(http://www.abs.gov.au/AUSSTATS/abs@nrp.nsf/Previousproducts/312011341Industry12007-2011?opendocument&tabname=Summary&prodno=312011341&issue=2007-2011)

2. Methodology

Moranbah and the IRC located within the Bowen Basin were chosen as a case study for this research to allow comparisons with two other case study sites located within the Western Downs (Queensland) and Hunter Valley (New South Wales). The three case study sites collectively form part of a larger research project however this report focuses on the findings of the Moranbah case study. During the period 10-12 June 2014, two Centre for Social Responsibility in Mining (CSRM) researchers visited Moranbah to:

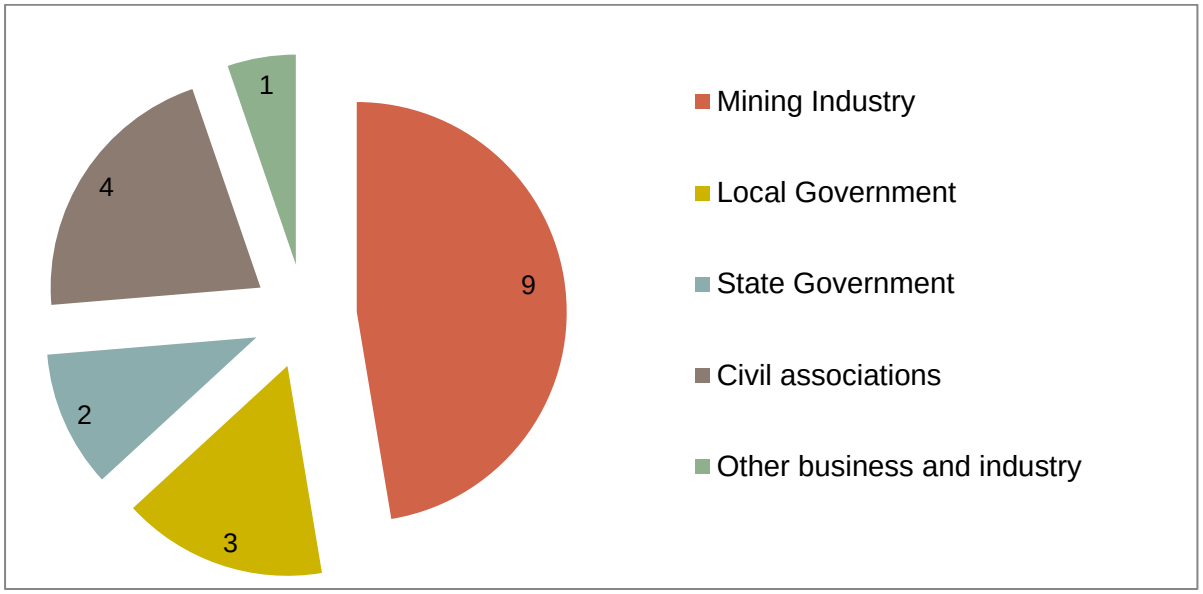
- Conduct group and/or individual interviews with key stakeholders in Moranbah
- Observe the cumulative impacts from coal mining and other land uses that affect Moranbah and surrounding areas

During this field visit, the CSRM researchers attended a community roundtable held as part of the IRC community engagement program. This informed the researchers about the challenges faced by the town and the current and future development opportunities that are being proposed for Moranbah.

The researchers also contacted and invited other relevant respondents to participate in phone interviews between June 2014 and August 2014.The interviews were undertaken either individually or collectively with a range of one to three respondents in each interview and lasting 1.25 hours on average. All interviews were confidential and followed The University of Queensland ethical guidelines. In total, thirteen interviews were conducted with 19 individuals involved (Figure 3). Although the research method was not specifically

designed to ensure an equal gender balance, the respondents reflect a gender balance whereby nine males and 10 females participated in the interviews. The spread of participants across sectors is shown in Figure 3.

Figure **3**: Number of Individual Respondents



A semi-structured questionnaire was designed with specific open-ended and survey questions tailored for Queensland and Moranbah respondents (see Appendix A). Through this questionnaire, CSRM researchers captured the knowledge, experiences, opinions and perceptions of key stakeholders in applying the policies and specific measures intended to manage cumulative impacts in a multi-industry region. The responses were analysed, triangulated with literature, and are summarised in this report.

3. Main impacts with cumulative dimensions and related measures, policies or legislation

During the interviews, the CSRM researchers found that respondents could identify significant impacts that have cumulative dimensions. However, respondents had difficulty in explaining the interactions of impacts resulting from multiple industries on a larger scale (e.g. a water catchment). For the most part, respondents were able to present local and on-site environmental impacts of individual operations/ enterprises that were either real or perceived. Respondents were also keen to raise cumulative impact concerns in relation to the local economy, housing and roads.

In framing the discussion of the three identified groups of impacts such as environmental; community and social; and economic and administrative as provided in the next sections, it is important to note that respondents frequently mentioned two issues of concern: the recent mining downturn and Fly-In-Fly-Out (FIFO) workers. The recent mining downturn has provided 'reverse impacts' to those experienced during the mining boom (that is, house prices and employment opportunities are declining). By most respondents, FIFO is considered to exacerbate these reverse impacts as it was considered to exacerbate negative impacts on accommodation prices and labour shortages during the boom.

3.1 Environment

3.1.1 Air quality/dust

All respondents agreed that dust and air quality are a priority cumulative impact to manage in Moranbah. A lack of data provides uncertainty about the real and perceived impacts of dust and air quality in Moranbah, especially that stemming from coal industry operations over time. This was reflected by one respondent:

> *"In the township, it is difficult to separate between the nuisance and actual impacts of dust on health… but because the region is hot, dry and lots of dust, people worried about dust and thought it might not be healthy for the air that they breathe in. There is no data to show a direct connection between dust and health but because mine activities are continuously happening nearby their living town, the community feels that mining will have some kinds of long-term impacts on community health"* (Civil Association 4).

The cumulative sources of dust were raised by some respondents as resulting from multiple coal mining operations, agriculture activities, quarries and recent urban development. The majority of respondents mentioned that coal mining activities have been the biggest contributor of dust in Moranbah. However, the civil association respondent further highlighted the links between dust impacts and housing development and quarries:

> *"Mining development has been pointed for the dust issue but there are other activities such as housing and quarries that produce dust impacts and they are not regulated. When I confronted the quarries about the dust issue, they thought they did not produce dust"* (Civil Association 4).

Similarly, a respondent working for the coal sector (formerly a farmer) conjectured that:

> *"Agriculture produces greater dust impacts than mining. However, the level of scrutiny is different between the two [mining has been scrutinized more intensely than agriculture]. If mining is taken out from the current cumulative impacts equation in Moranbah, dust will still be a major issue due to agriculture and the hot and dry climate in the region"* (Mining Industry 1).

As community complaints concerning dust have become common in recent years, the Moranbah Cumulative Impact Group (MCIG) [1] was established in 2010 as a voluntary organisation to "*better understand the cumulative impacts of development on the town of Moranbah*" (http://mcig.org.au/).

Most respondents noted that dust is the only impact[2] that is currently being monitored through the MCIG and agreed the MCIG has effectively brought relevant parties together to monitor dust and provide reliable air quality data which were not available in previous years. This effort has demonstrated the role of MCIG as a multi-stakeholder group in encouraging its members to (i) share dust monitoring data in Moranbah and its surrounds, (ii) to

[1] In 2012, MCIG appointed an independent chair and project officer and recently, an independent consultancy has been selected to act as project manager of MCIG. These changes to the governance arrangements have made the role to the LGA (which previously auspiced the project management role within MCIG and convened meetings) progressively more equal to other collaborating members: mining companies, unions, community and state government.

[2] The MCIG website states that, in the future, MCIG plans to monitor other issues such as noise, vibration, other environmental and social concerns (http://mcig.org.au/issues/).

introduce monitors at impact points (i.e. in the town) as well as at operation boundaries, and (iii) to respond collectively without seeking to establish proportional responsibility.

Although MCIG has been recognized as a useful multi-stakeholder platform to tackle issues of dust, one respondent argued that "*the effectiveness of MCIG is still based on good will [of its company members in particular]"* (Local Government 1). This is largely because the MCIG does not have sufficient power to act, or even plan actions, based on monitoring data. In other words, respondents suggested that MCIG needs to be scaled up to take a role in managing the cumulative effects of dust, not just monitoring dust levels.

At the individual company level, industry respondents mentioned that coal companies closest to the town have adopted dust monitoring programs that exceed standard compliance requirements. Respondents from such coal mining operations observed that the scrutiny processes from governments and communities have been harder upon their coal mining operations than on coal mining operations that are distant from town. Consequently, the nearest coal mines have 'voluntarily' invested in additional dust monitoring devices. Although these voluntary efforts incur an extra cost to companies, most mining industry respondents said that the companies need to undertake such action for two main reasons:

- to defend themselves in anticipation of future complaints from communities; and
- to actively provide better information to communities on dust and air quality levels.

3.1.2 Water and waterways

As in other parts of Australia, water security is critical to support industry and livability of communities in the Bowen Basin. With multiple users of water (especially the coal industry and agriculture) the concerns raised by respondents are: security of water supply; impacts of floods and droughts; the management of surface and underground water; and environmental flow and water quality.

Respondents from the coal industry suggested that managing water releases is a priority for companies. Coal companies in the region manage their water releases individually to meet their specific discharge conditions, transitional environmental programs (TEPs) and water management plans. Some also had additional monitoring associated with a pilot of enhanced water releases during the 2013-2014 wet season which cleared some legacy water issues.

Water monitoring programs that check quality before and after water releases show no compromise of water quality downstream for irrigation and town supplies. However, due to Queensland's flooding monsoon rains in the region, some mine sites receive more water than can be released and therefore "*flood waters are still retained in the site*" (Mining Industry 1 and 7). Nevertheless, coal mining industry respondents regarded these measures as reasonably effective as each coal mining operation has been given clear parameters to meet. One respondent mentioned further adjusting their water management after engaging with communities about these parameters and hearing their concerns (Mining Industry 7).

Most water monitoring focuses on salinity. Some coal mining companies in IRC have established a water monitoring program on Isaac tributaries that also consider other, especially subsidence-induced, impacts such as sedimentation.

Water management activities have accumulative effects when several coal mining operations release water into the same river system and the need to do so becomes critical during the wet season. Hence coal industry respondents said that this issue has been acknowledged as one of the top priorities to be managed collectively. The Fitzroy Partnership for River Health (FPRH) is a collaborative, multi-sector body that coordinates monitoring and reports on the health of waterways in the Fitzroy basin. The FPRH report card received positive feedback from respondents as it illustrates long-term river health trends. As with MCIG, respondents urged that the FPRH scale up its action from monitoring and reporting to collaboratively managing the impacts.

There are two other bodies that have been established in Australia to manage cumulative effects of water. The first body is the National Water Commission (NWC), an Australian Government statutory authority with responsibility for progressing the COAG national water reforms since 2004 and providing advice to the government regarding water management. A respondent from the agricultural sector endorsed the NWC's effectiveness in progressing water management saying, "*the NWC is the first model to deal holistically with the water resource and the combined effect of demands of all industries*" (other business and industry 2). However, the Australian Government has announced the closure of the NWC in its 2014 - 15 budget. It is expected that the NWC will be abolished and its statutory functions will be transferred to several government agencies.[3] The implications of the abolition are still unknown however it is unlikely that the holistic approach to managing cumulative effects of water will be maintained.

The second relevant body is also a federal government initiative. The Independent Expert Scientific Committee (IESC) on Coal Seam Gas (CSG) and Large Coal Mining Development was established as part of the "water trigger" initiative under the Environment Protection and Biodiversity Conservation Act (EPBC). This act is a key avenue for federal government intervention in resource development projects. The IESC was established as a statutory committee in 2012 in response to community concerns about CSG and coal mining and is responsible for providing scientific advice to decision makers on the impact that CSG and large coal mining development may have on water resources. In the Bowen Basin, the IESC has been requested to review new and proposed underground coal mining projects including: the Caval Ridge Project; the Grosvenor Project; Moranbah South; Isaac Plains; Eagle Downs; and Peak Downs mines together with CSG operations (the Moranbah Gas Project and The Bowen Gas Project) for the potential impacts that may happen in the Isaac River Catchment of the Fitzroy River Basin. The IESC has suggested additional scientific aspects be studied and indicated that the key uncertainty is their contribution to cumulative impacts, given their location in a region of significant resource development (IESC, 2014).

Interviewees valued the existence of IESC however gave limited information as to its current effectiveness. The Minister for the Environment (on 26 July 2014)[4], foreshadowed strengthening the role of IESC through proposed amendments within national environmental legislation. These amendments will allow the IESC's advice to be mandatory for the States and Territories where CSG and coal mining projects are being assessed under a bilateral agreement.

[3] The National Water Commission (Abolition) Bill 2014 is being discussed http://www.nwc.gov.au/organisation/closure-in-2014 retrieved 2 November 2014.

[4] http://www.environment.gov.au/minister/hunt/2014/mr20140726.html?utm_source=mins&utm_medium=rss&utm_campaign=feed

3.2 Community and social

3.2.1 Housing

During the mining boom, with multiple companies and mines operating and expansion or new projects fast-tracked, demand for housing outstripped supply. House prices and rent levels were very high and vacancy rates were low. Hence the impact of the boom on housing in IRC mostly manifested as limited supply and unaffordability. To respond to these issues, the Local Government Authority (LGA) stepped in to the housing market although this action is unusual for "*normal responsibilities*" of a local government (Local Government 1 and 2). Some respondents highlighted actions by the LGA to ease the housing pressures including:

- *Housing scheme development program* – to cater for diverse needs and demands including for singles – was managed by Urban Land Development Authority (ULDA) (Civil Association 3)
- *Social housing in the region* – advocated for by IRC to those responsible in state government (Community Roundtable)

IRC bought a large block of State Government land in Belyando for future residential estate development. Because lack of suitably zoned land has hampered capacity to allow quick construction of accommodation in the past, the Council saw this as a "*back-up strategy*" to anticipate another mining boom that may hit Moranbah and the Isaac region so that the LGA can have a fast response to any increase in housing demand (Local Government 1 and 2). Almost all respondents provided feedback on the ULDA housing scheme as a response to mitigating cumulative impacts on housing associated with growth. One local government representative summarized the issues associated with the ULDA housing scheme comprehensively (Box 1).

During the June 2014 field visit, respondents reported that accommodation prices have fallen dramatically due to the excess supply of housing. This trend has been also reported recently (ABC online news, 2014):

> "*As values fell, the vacancy rate climbed and there are now 300 empty rental properties in Moranbah. Ms Exposito [a real estate agent in Moranbah] said she had never seen anything like it in her 27 years in the business*".[5]

During interviews, some respondents expressed the opinion that the low price of houses posed their own set of challenges for Moranbah. A local government representative mentioned that this condition attracts low income earners to the region. The more they come, the more pressures are placed on the town to provide public services such as public transport, cheap health services and other services that the town currently does not have capacity to supply.

[5] http://www.abc.net.au/news/2014-10-15/moranbah-businesses-struggle-as-mining-production-slows/5816290 retrieved on 30/10/2014

Box 1: ULDA Housing Scheme

I know this was a result of cumulative impacts associated with growth …and I know its intent is to mitigate the impacts surrounding that growth. I don't think it is the fault of that plan but it's the fault of the system. It did not flow from analysis to action… By the time its delivery occurred, it was not necessarily in line with the community's aspirations and it was too little too late and a few of those sorts of things… Once again, it's not necessarily the report; but the system of implementation actually did ignore a lot of on the ground sentiments at that time. Unfortunately, it delivered a wrong result.

As an example… the promise was that, as the state department, they will deliver faster than other kinds of private system or local government in that space. It did not turn out to be that quick. Similarly when it came online, we were already seeing the down turn and the housing stock which it delivered did not meet the demand or aspiration of the community. The houses while they appeared to be attractive on the outside, they are exceptionally small …

My understanding is … because of it being managed remotely, there have been a lot of issues with the quality of the infrastructure that has been delivered to parts of that estate as well which will ultimately become council liability and the council had a lot of discussion with previously ULDA and EDQ now, around rectification works in relation to that… mostly around gardening and drainage that sort of things. It's questionable whether the houses will be resilient or not (Local Government 3).

3.2.2 Community infrastructure including roads

Impacts on local infrastructure (especially roads) were also raised by interviewees:

> "*the pressure on roads has eased a bit now in comparison to during the boom. In the Bowen Basin, [mining] companies and the LGA try to manage and reduce the amount of traffic"* (State Government 1).

Effective management of the cumulative impacts of a mining boom/bust on road traffic and the road network places different demands at each stage of mining exploration, construction and operation activities. It is mainly the responsibility of state and local government but relies on quality information from companies, and one state government representative mentioned that, although impacts are projected during the exploration and approvals stages, the activities might not proceed. The challenges of companies and different levels of government cooperating to manage unpredictable impacts were evident.

Mining industry respondents mentioned that mining companies have been contributing to community infrastructure through their social investment and donation programs. Those programs are funded by mining companies with community guidance and input. Most of the recent programs were identified in the Social Impact Management Plans (SIMPs), and, although the SIMP was not required anymore, some companies still promote this for internal use and negotiation with communities. The community infrastructure programs can also be funded through the "*Moranbah 2020 fund*" (Mining Industry 5). This initiative is based on a partnership created between companies and the LGA. Programs are identified based on needs in the community through a reference group and as one of the mining industry respondents claimed, focuses on programs that have a "*long term legacy*", for example a town swimming pool (Mining Industry 5).

Another avenue for supporting regional programs and delivering infrastructure projects is through the "royalties for regions"[6] initiative recently introduced by the Queensland Government to fund programs including community infrastructure, roads and transport and flood mitigation. Although the general principle of this program was widely supported, many respondents criticised its effectiveness. One LGA respondent's criticism was that the program wasn't equitable in returning royalties to the region where they were generated. This was illustrated by the fact that the Isaac region contributes more than 50% of total mining royalties to Queensland and yet received in return only 0.01% of Queensland's mining royalties (Local Government 3). Other local government respondents said that the criteria for allocating "royalties for region" do not reflect impacts on LGAs that have resulted from extractive industry operations (Local Government 1 and 2). Eligible projects are seen as too limiting since the community infrastructure (such as roads) does not suit an LGA that might not be able to pay the maintenance costs. Most roads that were identified for criticism in Moranbah are state government roads and the state government has not accompanied the scheme with boosted state government spending on its responsibilities for the schools, hospitals police, state roads etc in the region.

3.3 Economic and administration

3.3.1 Local employment and business

Respondents agreed that the mining industry has created employment and business opportunities in the region and that these had been positive cumulative impacts in the past. However, the interconnections between various factors that typify cumulative impacts as well as their vulnerability to exogenous factors are evidenced in this impact area. Unfortunately, during the June 2014 fieldwork, most respondents were pessimistic about positive impacts continuing into the future as the region was beginning to experience the reverse impacts of the coal mining downturn with the loss of local jobs and flow on impacts to businesses.

The local workforce has been impacted negatively as companies started to reduce staff numbers. In September 2014, BMA cut 700 jobs across its seven coal mines in the Bowen Basin. An additional 300 jobs will be removed from the Isaac Plains Mine (East Moranbah) as the owner, Sumitomo Corporation, shuts down its operations (ABC online news, 4th October 2014).[7] Some of our interviewees claimed retrenched miners living in town were being denied advertised jobs on the grounds they were FIFO positions – for long-distance commuters and not available to locals. Given this perception, the downturn has exacerbated community resentment of the 'fly-over effect' associated with FIFO.

Representatives of civil association said that many local people who lost their jobs have left the town and that some local businesses may close-down if the current situation does not improve. These representatives argued that the job cuts came on top of the increasing employment of FIFO for mine workers that provides little benefit to local businesses in Moranbah (Civil Association 1 and 2). Many FIFO workers do not have the ability or necessity to come to the town which means that they do not spend their money in the town. The accommodation camps/ villages buy supplies in bulk from larger centres rather than rely on local suppliers.

[6] http://www.dsdip.qld.gov.au/about-the-program/regional-development/about-the-royalties-for-the-regions-program.html retrieved 30 October 2014.

[7] http://www.abc.net.au/news/2014-10-03/bowen-basin-communities-face-bleak-future-in-coal-downturn/5789452 retrieved on 30/10/2014.

The IRC makes clear its perception of the impacts of FIFO in its recent response to the "Green Paper on Developing Northern Queensland" stating its opposition to FIFO policies for new extractive projects in the region:

> "*Isaac's key economic driver, the resource sector, is highly regulated at the state and federal level and extremely exposed to the political ideology of the day. The region's capacity to attract the resident population necessary for regional growth is diminished by new sector projects with workforce arrangements mandating employees must reside in coastal metropolitan centres, removing the choice to live with their families in the regions in which they work. While it is recognised this is a form of 'spreading the wealth across Australia', this anti-regionalisation arrangement is undermining the economic prosperity of regional Australia and the long-term sustainability of regional towns and communities* (IRC, 2014b, p. 5).

In the past SIMPs allowed companies to make projections of their employment benefits as well as to propose ways to mitigate any social issues that may potentially arise from their mine operations. FIFO has been proposed within some SIMPs to mitigate impacts of the high fluctuation in workforce requirements and maintain flexibility with respect to recruitment. Based on the current situation and our review of some SIMPs, it is apparent that most SIMPs did not take into account the potential for reverse impacts with a mining downturn. The SIMPs did, however, predict the number of employees for different stages of mining life such as construction, operation and mine closure. Company respondents mentioned that they always faced challenges in managing these transitions and there is a tendency to manage for the peaks rather than within threshold ranges.

3.3.2 Land uses

Respondents mentioned that land use conflicts occur in Moranbah between existing land-uses (agriculture) and major development activities (mining, infrastructure and urban expansion activities), *"Moranbah has limited space to grow as a town. There is a limited opportunity for urban sprawling as mining has occupied lands on the town boundaries"* (Mining Industry 3,4,5). There were related concerns voiced, "*Council concerns about quarantining of land for the future because of developments*" (Local Government 1 and 2). A mining industry respondent mentioned that the "*land grab*" (Mining Industry 2) by the coal industry in the Central Queensland region had significantly skewed the land values and constrained potential future uses of land within some regions.

There are several measures that are available to plan and deal with land allocations and management in Queensland. The key measures are handled in statutory regional planning and Strategic Cropping Land (SCL) (now prime agricultural land) arrangements; the establishment of "key resources areas" and settlement buffer zones. Interview responses in relation to the usefulness of these measures vary:

- Statutory regional planning (including key resources areas) and local plans – Respondents regarded these measures as potentially effective for land allocation and zoning. The IRC however does not have the statutory document yet.[8] A local

[8] The last regional plan was developed in 2011 (released in 2012). It was not a statutory plan. The Mackay, Isaac and Whitsunday Regional Plan will be reviewed and the Regional Planning Committee (RPC) has been established as advised in the Qld Government's gazettal notice on 4th November

government representative mentioned that: "*I actually quite like the regional plan… I used to refer to them for a fair bit. I am not sure if it deals specifically with [cumulative] issues but there's always policy around actions they contain that is relevant to something. So they did seem comprehensive enough to open them up at any time and find* ***a position*** *on it. So I quite like that. In term of managing cumulative impacts, it did not assess or manage those. From memory, it's reflecting the importance of managing the cumulative impacts associated with development but as a tool, it does not either assess or manage itself"* (Local Government 3).

A community representative said local planning approaches such as the IRC plan are of limited value in dealing with cumulative impacts adding, *"It is about zoning and land-use planning. The communities feel this is less effective and does not have enough opportunity to influence the development"* (Civil Association 4). For example, the Isaac Region 2020 vision recognized potential cumulative impacts however a community respondent mentioned these as observations only with no management/assessment to deal with cumulative impacts. However, a local government representative noted improved planning using a model for future planning they had commissioned from KPMG, and which assumes population projections are a strong indicator of major cumulative impacts, "*the KPMG report significantly improves in-house planning. This is effective to assess cumulative impacts. Managing however is difficult. Cumulative impacts tend to be legislated at the state level and [therefore] this [report] is a tool to give voice and advocate change*" (Local Government 3). In this study, KPMG concludes that "the expansion of mining activity may hold many challenges for the Isaac region, but through sensible planning these challenges can be effectively managed" (IRC, 2011[9])

- Strategic Cropping Lands (SCL) – under the short-lived SCL legislation, the Queensland Government has released the Queensland Agricultural Land Audit in 2013. Respondents mentioned that Moranbah and its surrounds do not classify as SCL. The mining industry respondents felt that SCL came into effect in a "*rushed process*" (Mining Industry 8 and 9) consequently its implementation has been ineffective. A respondent said that "*SCL helps to some extents but it delays the projects and does not achieve the policy intention*" (Mining Industry 9). In October 2014, the Queensland government introduced the Regional Planning Interest (RPI) Act leading and repealed the Strategic Cropping Land Act 2011. The SCL trigger map is part of the RPI Act (as "High quality agricultural land") and has been approved by the Department of Natural Resources and Mines.

- Settlement buffer zones – all respondents agreed that this measure does protect Moranbah because the buffer zone for urban restricted areas is 2 km and, in Moranbah's case the nearest development application since this legislation is for a mine 3km away! The town itself was established to serve the mining industry and now has a population of close to 10,000. The intention to balance the needs of the resource industry with those of towns of over 1000 residents has not been adequately managed

2014 (*https://publications.qld.gov.au/storage/f/2014-11-06T22%3A08%3A58.279Z/07-11-14-combined.pdf*).

[9] http://www.isaac.qld.gov.au/social-and-economic-data/journal_content/56/12238/4954095?p_p_auth=bXVgMlY7 retrieved 2 November 2014.

by the legislation in the eyes of one respondent, who emphasized the problem of growing towns stating: *"within the town, there has been lots of pressure to build houses, what you think about adequate buffer zone between the industry and town may not have been attended to"* (Civil Association 4). In resource towns like Moranbah, these issues are contentious because it can be said that residential areas have encroached into industrial areas rather than the other way around.

The subsequent Regional Planning Interests Act has introduced a more comprehensive approach that integrates these separate measures. This was not included in our consultations but it identifies and protects areas of Queensland that are of regional interest which might be considered an improvement because it seeks to manage the impact and support coexistence in areas of regional interest. Through this Act, the Queensland State Government intends to achieve a balance between protecting priority land uses and delivering a diverse and prosperous economic future in the regions through statutory regional plans.[10]

3.4 Other impacts and measures to deal with them

Some respondents expect that ground vibration and subsidence and its associated impacts (particularly for the Isaac River and its tributaries) may occur as a result of the underground longwall mining. The IESC report (2014) suggests that underground mines may result in ponding, changes in groundwater-surface water dynamics, and loss of connectivity along the river and its tributaries. The IESC also suggested that it is important to understand the degree of groundwater and surface water connectivity along the Isaac River and its tributaries and to evaluate the risks associated with ponding. BHP Billiton Mitsubishi (BMA) and Anglo American have conducted two cumulative impact studies on the Isaac River related to subsidence through Alluvium, a private consulting firm specializing in the management of water resources, rivers and catchments. The first study was undertaken in 2009/10 and then updated in 2013/14 taking into account new projects and altered mine plans.

4. General themes in Moranbah

4.1 Ways to assess cumulative impacts are more prevalent than ways to manage cumulative impacts

Generally speaking, environmental impacts are better assessed than social impacts. However, for both kinds of impacts, there are more effective practices for assessing cumulative impacts than for managing cumulative impacts. Neither voluntary nor legally binding measures have assisted in managing some of the cumulative impacts in the Isaac and Moranbah region. When respondents were questioned about these, they identified challenges and opportunities in relation to managing cumulative impacts as follows:

- Difficulties in forecasting cumulative impacts especially because of lack of comprehensive information – One respondent argued that governments should take the responsibility for '*a helicopter view*' in assessing risks (Civil Association 4). A new effort in assessing risks of new project proposals that has been piloted, approaches this. In it, the federal and state governments have worked together to conduct a bio-regional assessment to anticipate projects' impacts on the Great

[10] http://www.dsdip.qld.gov.au/infrastructure-and-planning/regional-planning-interests-act.html retrieved 13 December 2014.

Barrier Reef areas. There has been strong support for these initiatives from various parties. However, some community participants expressed views that the assessments are still unduly influenced by economic interests of state.

- Inadequate guidance for performance measures and practices to deliver within defined parameters, "*the government regulations set up minimum and non-negotiable space but we need to go beyond this*" (Other Business and Industry 2). Companies can implement efficient compliance strategies and mechanisms but effectiveness of those is not clear beyond direct and immediate impacts.
- Many cumulative impacts call for collective and collaborative action (Franks et al, 2010 and Porter et al, 2013) which is difficult for companies to commit to. However the cycle of boom and bust currently being experienced in the Isaac region has prompted greater willingness from companies to cooperate in order to address cumulative impacts efficiently.

4.2 The most common scale of action is site level

The interview data show that on-site measures are the most common approach. The environmental management plans and EIS conditions are the most discussed measures. Companies need to comply and meet the conditions required through these on-site measures as established for individual operations. As a result, mining industry representatives mentioned that their efforts seem ad-hoc and fragmented. For example, one pointed to needles duplication as, "*mining companies set up their water monitoring gauges side by side at the same locations*" (Mining Industry 7). The mining industry respondents understood these efforts have been ineffective; however, they need to meet their own reporting schedule requirements as well as produce data to support their communication with their communities of interest. These respondents further stated that mining companies do tend to conduct impact monitoring beyond requirements or, as one said, "*over-compliance*" (Mining Industry 6). The main driver for exceeding compliance standards is to defend themselves from complaints and to have well-founded communication to mitigate and prevent conflict with communities. If complaints about either real or perceived impacts cannot be avoided, the companies are able to deal with the complaints with the support of plenty of relevant data. Although 'site level management' of cumulative impacts seems to dominate in the region, there have been collaborative and multi-stakeholder efforts identified in the region to manage cumulative impacts on the larger environmental scale (see Section 4.3).

4.3 Positive collaborative trends in dealing with cumulative impacts

In the Bowen Basin region, at least three collaborative groups have emerged to deal with cumulative impacts, namely: Moranbah Cumulative Impact Group (MCIG); Fitzroy Partnership for River Health (FPRH); and – further afield at a major coal port and relevant to a diverse industrial context – Clean and Healthy Air for Gladstone (CHAG).

Feedback received during the interviews shows that there are multiple drivers for parties to collaborate in assessing or managing cumulative impacts including:

- to respond to a shared 'crisis' or attempting to prevent or avoid a crisis;
- to contribute to local sustainability;
- to avoid constraints on their business activities; and
- to care for community and maintain a Social License to Operate.

The reasons multi-stakeholder collaboration might serve these purposes related to the opportunity they provided for: better communication; sharing of monitoring data; and concrete actions to manage cumulative impacts. For example, to promote collaborative water monitoring programs the FPRH provided its partners with a list of duplicated water monitoring points (see the issue raised by Mining Industry 7 in Section 4.2) and encouraged cooperation to remove duplication. The efficiency of this effort however is questionable as some companies took this up while others did not (Mining Industry 9). In the case of the FPRH, coordination is undertaken by the regional NRM body, but in many cases, as for the strategic bio-regional assessment mentioned earlier, there is a role for the government in coordinating. An industry respondent mentioned that there has been an attempt by the Queensland Government to introduce a coordinated approach to manage cumulative impacts of water releases known as 'a pilot release scheme'. This scheme was introduced in 2012 for four mine sites in the Isaac River area and then expanded for the 2013/14 wet season to become eight mines (Goonyella riverside, Peak Downs, Saraji, Norwich Park, Blackwater, Gregory Crinum, Oaky Creek and Ensham Coal mine). A recent review conducted by OD Hydrology (September 2014) as commissioned by Department of State Development, Infrastructure and Planning (DSDIP) suggests that the scheme has succeeded in improving mine water release opportunities and achieving compliance with the DEHP's operating policy (mining) without having material effects on salinity level downstream (OD Hydrology, 2014: 10). Such an active role by government was generally deemed more effective than a hands-off approach (see section 4.4).

4.4 Calls for governments to take a leadership role in dealing with cumulative impacts

Feedback received from respondents suggests that governments need to take a leadership role in establishing better policies and measures for dealing with cumulative impacts and setting the parameters for development within sustainable limits because,

> *"Regulation is important… it has been most effective where it sets thresholds or minimum performance standards, for example no go on SCL. But the problem is that we're not always enforcing. Regulation should set minimum performance standards and non-negotiable requirements. Market should provide the development environment. Relationships between sectors are needed as the foundation for better results"* (Other business and industry 2).

Recently, both the Federal and Queensland Governments have enacted new regulations that potentially deal with cumulative impacts e.g. water triggers, Local Area Infrastructure Program (LAIP), Proponent Service Delivery Charter (as part of the SIA guidelines) and other measures. In Queensland, regulatory enforcement seems to have declined. Mining industry respondents mentioned that the current Queensland Government has introduced a new strategy of regulating outcomes as in the pilot release scheme where the issue was not how much saline water a mine released but what its effect was downstream. However, CSRM researchers received limited feedback about these newly introduced measures during the June 2014 field visit in Moranbah. Representatives from the mining industry, local and state government, civil associations and other business and industry interviewed as part of this research had limited direct experience with the latest measures. However there were conflicting views about the regulatory trend in general with some bemoaning a pro-mining

government that was reducing regulatory ‘hurdles’ while others accused the government of overly regulation-based management strategies and considerable ‘red and green tape’.

Universally, respondents also mentioned that, the current major project approvals and management of their social impacts in Queensland have evolved from “strict to loose” requirements. Respondents believed that “*the mix should be right*” and to get this balance, and ensure full consideration of local impacts, the representative of Local Government argued that greater roles need to be given to councils. Currently, the LGA does not have meaningful roles in the approvals and monitoring processes, consequently, it is difficult to provide feedback and influence decisions (Local Government 3). This LGA representative suggested that greater collaboration needs to be promoted between companies over assessment and management – not only to understand risk and impact from each operation but to put that in the context of the ‘locality’. The suggested model or system should be flexible enough to analyse and accommodate commodity cycles and other fluctuations.

4.5 Mixed perceptions regarding EIS, SIA and the former SIMP

For a few years at the heights of the boom, Social Impact Management Plans (SIMPs) were required for approval of major projects although this is no longer the case. During the interviews, respondents intensively discussed the roles of SIMP in managing impacts and the positive and negative implications of the elimination of the SIMP. Views expressed were that these were a promising start with sound policy intentions but there were a number of reservations or criticism voiced including:

- Difficult to implement. The reasons included: (1)”dating” of SIMPs developed pre-construction such that undertakings lost their currency and relevance later; and (2) the document captured high level impacts but ‘the devil is in the detail”.
- SIMPs were not enforceable (in contrast to sanctions for environmental breaches).
- The variable quality of the SIMPs depended on who developed the plan.
- The Terms of Reference (ToR) were not flexible enough to adapt to context.

Nevertheless, many regarded the SIMP as still useful for communication and planning and were continuing to use them.

5. Summary: Assessing and managing cumulative impacts in Moranbah

5.1 Looking outside the fence to consider the receiving environment

Universally, respondents believed that they need to consider impacts beyond the fence of an individual operation. There were examples of collective actions in monitoring cumulative impact challenges (e.g. dust and water issues) at the broader scale of the receiving environment (e.g. town airshed and catchment) in the Isaac region, notably through the MCIG and FPRH. However, as classified by Porter et al (2013), these actions achieve some coordination (MCIG) and cooperation (FPRH) through sharing of information, resources and responsibility and yet they fall short of achieving the mutual capacity building and synergistic action associated with the most productive collaboration.

The involvement of companies in a catchment-based approach to water stewardship by looking outside their operational site to also consider potential impacts of other users and

operations is endorsed as good practice globally (ICMM, 2014). The FPRH seeks to align with these global aspirations by looking at all activities, community assets and ecosystem components in the whole catchment. There is value not just in monitoring salinity and mine discharges but its broader objective of contributing to the region's natural resource management and to the health of the iconic Great Barrier Reef. Similarly, members of MCIG seek to progress multi-sectoral action to coordinate dust monitoring in the region and then move to apply consistent, leading practice ways of managing impacts and responding to the results of dust monitoring.

5.2 Assessing risks is important to managing cumulative impacts

We found that coal companies are "willing" to work together to tackle cumulative impacts, although the uncertainties surrounding cumulative impacts have created a barrier to action. Limited baseline benchmarks and lack of data concerning risks were the two major reasons provided for the limited on the ground efforts at collaborating in addressing the management of cumulative impacts. Porter et al (2013:p.668) state that "uncertainty, incomplete knowledge, multiple actors, ill-defined spatial and temporal boundaries and contested causality" are significant challenges to address cumulative impacts collaboratively. These same challenges were noted by our respondents. In light of these challenges, our findings suggest that there is a need for governments to take a leadership role in assessing risks at a broader scale. Some current initiatives to assess risks associated with cumulative impacts are evident (such as National Water Committee, Independent Experts Scientific Committee and bio-regional assessments). However, the effectiveness of these initiatives was questioned due to some associated impediments: for example, IESC only provides recommendations; bio regional assessments are still regarded as unduly influenced by state economic interests; and despite the contribution of the NWC being valued by some respondents, the organisation has since been abolished.

5.3 Moving from assessing to managing

As suggested by most respondents, MCIG and FPRH have advanced *monitoring* but also need to promote collective efforts in *managing* cumulative impacts based on the baseline and monitoring data that have been collected and collated in past years (Section 4.1). To situate MCIG and FPRH in the cumulative impacts management hierarchy provided by Franks et al (2010), MCIG and FPRH need to ensure that they promote "synergies" beyond individual operations and on-site activities to manage cumulative impacts in Moranbah and industries need to change their practices when data show negative cumulative impacts. Similarly, Porter et al (2013) suggests that multiple impacts need to be considered in an integrated manner to understand interactions between each area of impact and aggregate thresholds need to be established. Subsequently, these will allow multiple actors to plan and act collaboratively in addressing and managing cumulative impacts.

5.4 EIS has limitations for assessing cumulative impacts

It is apparent that the EIS alone does not provide a comprehensive enough foundation for proponents to consider cumulative impacts. As discussed in section 4, EISs and associated environmental impact management plans have effectively guided the on-site impact management of individual projects. However, as major CSG and underground coal development progresses, people demand more rigorous processes to scrutinise the combined and interacting effects of the multiple projects and other activities in the local and regional context.

There are, however, emerging precedents of higher requirements in the planning and approval process that the proponents of CSG and large coal mining development need to follow under the scrutiny process of IESC. The IESC has advocated that companies undertake a new approach of considering total cumulative impacts (on water) in locations where multiple established mining activities are located together with new ones. However this is not a straightforward process for surface and ground water impacts. Even less refined are processes for assessing some social impacts.

5.5 Roles for community, scientific experts and independent bodies in the approval process

Respondents generally agreed that governments should play a significant role in providing input about risks as discussed in Section 5.2. However, disagreements were evident between respondents from different sectors about the need for more input from communities and also from independent scientific advice (e.g. IESC) to assessment and approval processes. A respondent mentioned that:

> "*a risk management approach upfront is better than focusing on every detailed issue in the EIS process. Thus, governments, in particular the local government, need to provide more inputs in assessing risks and not necessarily to include more communities, landholders and scientific experts in EIS processes and scientific expertise in assessing risks*" (Civil Association 4).

Other respondents, however, believe that more input from external and independent parties is needed. Transparent reporting for public scrutiny of impacts resulting from multiple industry activities, and in particular coal mining, in Moranbah was regarded as important and a complement to local and scientific data. This is because some respondents believe that "*regulation is just the chock behind the wheel – the driver to get forward motion and to set the direction is community outrage*".

6. References and Useful Resources

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7. Appendix A: Questionnaires

Open ended questions – verbal answers

Introduction

Our questions will explore your experience and assessment of recent legislation, policy and practice changes intended to manage the cumulative effects of coal mining – especially in multi-industry regions. We're interested in processes for both *assessing* and *managing* cumulative impacts, whether regulatory or voluntary ones. Although we will not follow a set list of questions, some matters we might discuss are listed below.

Indicative questions

1. **Brief description of your organisation and its role in assessing and/ or managing cumulative impacts**?
2. **Description of the key 'assets' of your community/ region? Its essential characteristics?**
3. **The main industries and the main positive and negative impacts of each on the community/ region?**
4. **What are the priority cumulative impacts for you to manage?**
5. **What are the main drivers for you to take action about these**?
6. **What are the main changes you've noticed lately with respect to cumulative impacts**?
7. **It seems that many requirements for cumulative impacts assessment and management relate to the project EIA and SIA and so take a project-centred approach. What are the pros and cons of a project-centred approach?**
8. **Please tell us about your experiences with any of the recently introduced/ reformed processes and what you regard as the pluses and minuses of them in terms of how <u>feasible</u> they are for companies and other stakeholders to rely on**?
9. **What about their advantages and disadvantages (ie criticisms etc) as far as <u>effectiveness</u> in dealing with the sort of cumulative impacts you need to tackle**?
    a. **In what ways can you implement these measures to consider the combined stresses on a system and any thresholds and system limits**
10. **Tell us about both unilateral and collaborative initiatives you've been involved in or observed related to managing CIs**? (How successful were they?)
11. **When you're undertaking assessment of cumulative impacts what are your preferred tools and approaches**? **What about for managing them? – what has worked best for you?**
12. **How would you compare the current requirements and commonly used practices with others you're familiar with**?
13. **What sorts of stakeholder consultation are built into these processes** and what's your opinion of how adequate/ useful that is likely to be?
14. **What sorts of relationships are involved** (e.g. with Federal, State, and Local Government, between companies, between industries, with landholders, communities etc) in implementing processes for assessing and managing cumulative impacts?

Written Questions

1. Please detail the main local industries and the scale of them (e.g. lifespan, employment, proportion of regional GDP)

Industry	How long can it produce (lifespan)	Employment numbers	Proportion of regional production
1.			
2.			
3.			
4.			
5.			

2. Which of the following components of the socio-environmental system does your operation impact upon? (*Tick all that apply*)
   a. Catchment
   b. Aquifer
   c. Local labour force
   d. Air quality (dust and airborne emissions)
   e. Housing
   f. Social Infrastructure
   g. Biodiversity
   h. Land uses (incl. zoning)
   i. Noise
   j. Airblast pressure
   k. Ground vibration
   l. Subsidence
   m. Key resource areas/ critical industries
   n. Other (please specify)_____

3. Read through the statements below and indicate the extent to which you disagree or agree with them by ticking a box on a scale of 1 (strongly disagree) to 5 (strongly agree).

	Statement	1 Strongly disagree	2	3	4	5 Strongly Agree
1.	Cumulative impacts on infrastructure (e.g. roads, sewage, water supply) are well managed in this LGA					
2.	The various industries in this region complement each other in terms of the resources they need					
3.	The state government has sound regulations and policies to ensure resource companies do the right thing and are held to account					
4.	There is cooperation among industries in the area to address the cumulative impacts of human activities on the environment					
5.	Local industries and operations work to address social impacts beyond their geographic boundaries					
6.	Externally reportable social impact assessments and management plans should be in place for all mining and resource extraction projects					
7.	We have good measures and monitoring of cumulative impacts in this region/ local government area					
8.	A case management approach to development applications (as adopted by DSDIP in Qld) works well.					
9.	It is best to expect proponents to mitigate only impacts that are directly related to their project and Cumulative Impact where the proportion of the impact can be readily and reasonably forecast and/or separated from the total Cumulative Impact					
10.	We need more input from local communities, landholders and scientific experts into assessment of exploration & mining proposals					

4. Each of the measures in the table below was introduced or modified as a way to handle cumulative impacts – especially in multi-industry contexts. Please note that the rows are colour coded with NSW-specific measures shaded grey; QLD initiatives white and Federal ones peach coloured. You may only be able to answer about your own state. For each:

   - Tick in **column A** if it deals with issue/s of relevance to your operation or your locality.
   - Tick in **column B** for any of the measures you have experience with.

   (*For these two columns please tick all that apply*)

   In **column C** and **column D** please provide your assessment of the Effectiveness (C) and Feasibility (D) of each measure using the following rating scale:

   0 I have no sense of whether this could be effective/ feasible or not
   1 Not at all effective/ feasible for assessing and managing cumulative impacts
   2 Effective/ Feasible to some degree, or under some circumstances
   3 Effective/ Feasible to a considerable degree, or a good part of time
   4 Very effective/ feasible way of assessing/ managing cumulative impacts

	A. This deals with a material issue for this region	**B. I have experience working with this**	**C. Effectiveness for assessing or managing Cumulative impacts**	**D. Feasibility for us to implement**
To assess/ manage cumulative impacts on water (underground aquifers and/ or catchments)				
Aquifer interference Policy (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Guideline on the management of stream and aquifer systems in the Hunter Valley (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Amended SEPP (mining) standards for water pollution (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Water sharing plan for Hunter unregulated and alluvial waters (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
State Water Management Outcomes Plan	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Hunter River Salinity Trading Scheme	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Fitzroy Partnership for River Health (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Discharge conditions; Transitional Environmental Programs and water management plans (last amended 2012, Q)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
'Make Good' provisions (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Qld Water Commission CSG Report?	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
			0 1 2 3 4	**0 1 2 3 4**
"Water trigger" for large coal mines & CSG	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Independent expert scientific committee	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
National Water initiative (Federal)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
To assess/ manage cumulative impacts on land use				

Strategic Regional Land Use Plans (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Just Terms Compensation (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Agricultural Impact Statement (NSW)	☐	☐	0 1 2 3 4	0 1 2 3 4
Strategic Cropping Land Legislation (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Land acquisition and access clarification (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
To assess/ manage cumulative impacts on social infrastructure				
Regional Community Funds (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Proponent service delivery charter (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Regional & Resource Towns Action Plan Infrastructure Program (LAIP)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
To assess/ manage cumulative impacts on air quality and noise				
Upper Hunter Air Particles Action Plan (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Amended SEPP (mining) standards for air quality, and noise	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
NSW Health Development Assessment Guideline on dust emission thresholds	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Upper Hunter Air Quality Monitoring Network	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Moranbah Cumulative Impacts Group (Q)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Clean and Healthy Air for Gladstone (Q)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
To manage cumulative impacts on multiple components				
Land and Water Commissioner (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Critical Industry Clusters (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Integrated rehabilitation plans (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Gateway Process (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Cost-benefit analysis (optional) (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Strategic Assessment of a biodiversity plan for coal mining in the Upper Hunter	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Upper Hunter Mining Dialogue (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Hunter Regional Plan (NSW)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Hunter Region 20 year infrastructure plan	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Statutory Regional Planning (Qld) including Guideline on Mining & Extractive Resources	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Royalties for the Regions Program (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Key Resource Areas (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Settlement buffer zones (Priority Living Areas) (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Overlapping Tenures arrangements (Qld)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Resources cabinet committee	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
EPBC – biodiversity protection, – world & national heritage protection, – threatened species protection (Federal)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**

Supplementary Questions – Case study specific (Bowen Basin)

Each of the measures in the table below was introduced or modified as a way to handle some cumulative impacts – especially in Bowen Basin. We'd like to know if we've missed any and your experience of each:

- Tick in **column A** if it deals with issue/s of relevance to your operation or your locality.
- Tick in **column B** for any of the measures you have experience with.

(*For these two columns please tick all that apply*)

In **column C** and **column D** please provide your assessment of the Effectiveness (C) and Feasibility (D) of each measure using the following rating scale:

0 I have no sense of whether this could be effective/ feasible or not
1 Not at all effective/ feasible for assessing and managing cumulative impacts
2 Effective/ Feasible to some degree, or under some circumstances
3 Effective/ Feasible to a considerable degree, or a good part of time
4 Very effective/ feasible way of assessing/ managing cumulative impacts

	A. **This deals with a material issue for this region**	**B.** **I have experience working with this**	**C.** **Effectiveness for assessing or managing Cumulative impacts**	**D.** **Feasibility for us to implement**
To assess/ manage cumulative impacts in the Surat Basin				
Mackay, Isaac and Whitsunday Regional Plan	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Sustainable Resource Communities Policy	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Social Impact Management Plans	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
OESR Cumulative Population Projects	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Fitzroy Basin Water Resource Plan 2011	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Urban Design Framework (Dysart and Clermont)	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
The Isaac Region 2020 Vision 2009 - 2019	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
KPMG's *Redefining regional planning: measuring growth*, a managing change tool	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Isaac River Cumulative Impact Assessment of Mining Developments	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Adaptive communities (non-resident workers accommodation in the mining and petroleum industry	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Social, Cultural and Community Services and Infrastructure analysis for the towns of Blackwater and Moranbah: ULDA	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Other council plans	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**
Other communities group dealing with CIs?	☐	☐	**0 1 2 3 4**	**0 1 2 3 4**