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BOWEN BASIN REGIONAL HOUSING DEMAND: IDENTIFYING THE PREFERENCES OF MINING EMPLOYEES

Milestone Report Four

Prepared for Department of Tourism, Regional Development and Industry (DTRDI)

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Abbreviations

ABS	*Australian Bureau of Statistics*
ACOSS	*Australian Council of Social Services*
AMCORD	*Australian Model Code for Residential Development*
BBRH	*Bowen Basin Regional Housing (model)*
CH	*Community Housing*
CSHA	*Commonwealth State Housing Agreement*
CQU	*Central Queensland University*
DIDO	*Drive in/Drive out*
DIP	*Department of Infrastructure and Planning*
DoC	*Department of Communities*
DoH	*Department of Housing*
DTRDI	*Department of Tourism, Regional Development and Industry*
EIS	*Environment Impact Statement*
EPA	*Environment Protection Authority*
FIFO	*Fly in/Fly out*
ISRD	*Institute for Sustainable Regional Development*
LGA	*Local Government Authority*
NGO	*Non-Government Organisation*
OESR	*Office of Economic and Statistical Research*
OSHS	*One Social Housing System*
PPP	*Public-private partnerships*
SAAP	*Supported Accommodation and Assistance Program*
SHA	*State Housing Authorities*
SPP	*State Planning Policy*
SPQ	*Single Person Quarters*
TAFE	*Technical and Further Education*
TBL	*Triple Bottom Line*

EXECUTIVE SUMMARY

This report is the fourth in a series presented to the Department of Tourism, Regional Development and Industry (DTRDI) as fulfilment of the requirements within the approved activity agreement for the project titled, *Ensuring Sustainable Benefits from Boom Periods: A case study for a long term housing policy in the Bowen Basin* that commenced in February 2008. The first milestone report included a review of the aims and objectives of the project and a review of the current issues confronting the Bowen Basin region. The second milestone report included a Bowen Basin Regional Housing (BBRH) model capable of forecasting housing demand within regional locations and an early application of the BBRH model to five towns in the region. The third report explored with some depth the key Bowen Basin stakeholder views on the housing situation within the Bowen Basin with reference to mining towns, work-camps, and towns in the region (mainly coastal) that are the miner-preferred main residences when off-shift.

The research detailed in this report has involved a case study comparison between a model of future housing demands and data from mining employees for the same communities about their preferred location and housing options. The case study focus has been the impacts of the Dawson Mine on the nearby communities of Moura, Biloela and Theodore. Together with material from other stages of the research project, this allows some conclusions to be drawn about the key priorities for housing policy.

The housing model generated for the three towns identified future development pressures, predicting that the current housing stocks were likely to be inadequate to meet future demands of single person and couples without children households. The implications of the model were that more attention needs to be placed on developing flats, duplexes and other high-density dwellings.

This information was then compared to survey results for mine employees at the Dawson Mine. The results show that mine employees mostly come from the central Queensland region, largely expect to remain at the mine and in the local area for several years, and prefer living in larger houses rather than smaller accommodation units. There are three key results of the survey that can be highlighted. First, the demands for shared accommodation units such as work camps, shared housing and caravan parks are much higher in the short term than in the longer term. This has implications for transitioning parts of the workforce between types of accommodation.

Second, the longer term demands for accommodation are focused on medium to larger sized housing. Here, the preferences of the mine workforce for housing contrast with the modelled needs of the workforce when household size is taken into account. Managing the interface between preferences and needs will be an ongoing challenge for planning and development. Third, the needs and preferences of the mine workforce can be usefully categorised into groups, showing that preferences for housing will vary systematically according to the composition of the workforce. This helps to explain how the demands for housing will vary between mining operations and over time according to different workforce mixes.

The results of the research project allow for recommendations for housing policy in the Bowen Basin to be made at two key levels:

Important steps in the short term to address housing pressures are to:
- Identify housing needs associated with both population dynamics and industry developments,
- Address any constraints to housing development (such as land availability or approval processes)
- Provide appropriate information and stimulus mechanisms to ensure housing development,
- Tailor housing supply to the needs of particular groups within communities

Longer term strategies to address housing issues in the Bowen Basin can be summarised into five key areas:
- Identify preferred development models for communities, with a view to building a sustainable population base over time,
- Design strategies to focus population growth and development in appropriate patterns
- Ensure that infrastructure and services are available for community development in a timely manner,
- Encourage the appropriate development of services and lifestyle opportunities in communities to encourage appropriate population growth,
- Tailor planning schemes and housing development to meet the longer term needs of communities.

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SECTION ONE: INTRODUCTION

This report is the fourth in a series presented to the Department of Tourism, Regional Development and Industry (DTRDI) as fulfilment of the requirements within the approved activity agreement for the project titled, *Ensuring Sustainable Benefits from Boom Periods: A case study for a long term housing policy in the Bowen Basin* that commenced in February 2008.

This report (Milestone 4) is grounded and informed by the three previous reports (Milestone 1, 2 & 3) and extends the discussion of housing issues within the Bowen Basin in two distinct but complementary ways. Building on the earlier work the preliminary findings of the Moura case study are presented. This case study involves two large research data collections: a survey of mining staff and employees at the Dawson Mine Complex (reported here) and a general household survey (reported in Milestone 5) of the communities of Biloela, Moura and Theodore in central Queensland.

The second part of the report is focused on the policy implications from the research. The discussion draws on the Bowen Basin Regional Housing (BBRH) model and extends the earlier findings by connecting the model outcomes with possible future policy initiatives and the outcomes of the mining staff survey.

1.1 Project Background

The recent commodity boom and subsequent mining developments in the Bowen Basin has generated a number of housing pressures in the region, a situation that not only affects individuals and families but also has negative flow on effects for the local and regional economy. Higher prices and shortages of housing can impact on people with lower incomes, generating social pressures, as well as limiting the potential for further economic development and diversification. Addressing housing shortages is a key strategy to ensure that rapid development does not cause adverse social and economic impacts on regional communities, as well as to ensure that there are strong local and regional multiplier effects in the regional economies. However, before housing strategies can be developed, appropriate levels of prediction and planning need to be undertaken.

There are at least three key stages in identifying appropriate housing strategies in regional communities. The first is to be able to model the population changes and housing needs within a region or community of interest. An appropriate demand forecasting model termed the 'Bowen Basin Regional Housing Model' (BBRH) has been developed and was outlined in Research Report 2. This model projects demographic trends in the relevant communities, and then links that through to projected housing needs.

The second key stage in an analysis is to identify the key characteristics that differentiate communities and housing needs over time, helping to explain where model predictions may have to be adjusted or the circumstances where model results may not be very accurate. A particular focus within this stage is to identify when past population and housing trends which underpin most demand forecast models may differ from future trends. The focus of this analysis is to add to the standard predictions of a demand forecasting model with some sensitivity about the particular characteristics of the relevant communities and housing markets. The third key stage in the

analysis is to identify potential shortfalls in housing needs and the policies or strategies that might address the subsequent issues that arise.

The key focus of the work that is outlined in this report is on the second stage, where some in-depth information about community needs and trends are outlined in relation to the simple analysis from a housing model. The results of the comparison then drive some recommendations about appropriate housing policy for mining communities. The analysis is presented in a case study format, where the housing needs in one part of the southern Bowen Basin are assessed against the key drivers of housing demand: coal employees. In this study, the housing demand predictions for three towns (Moura, Biloela and Theodore) are assessed against the short and longer term needs and aspirations of the workforce in the nearby Dawson mine.

The benefits of focusing on a single case study mine in a relatively stable area are that the impacts of the mine and location of the workforce tend to be relatively stable, as well as being easier to identify. As well, the case study mine (Dawson Mine) is close to three different types of towns, allowing some identification of where mining employees would physically choose to live and interact with other parts of the community. The closest town to the mine is Moura, a traditional mining town in the Basin. Theodore is a small mixed farming town that is increasing its exposure to the mining industry, while Biloela is a diversified regional hub servicing mining and agriculture industries among other interests.

To assess the housing needs and intentions of people working in the mining industry, a survey was performed of employees of Anglo Coal at the Dawson Mine. The survey instrument was a 2 page paper questionnaire consisting of 16 closed and 4 open-ended questions. Researchers spent 3 days on site to organise the survey collection, with a total of 322 questionnaires completed and returned. Data was then coded and analysed to identify patterns in the responses from the survey, thus generating the material for the key elements of this report.

This report is structured in the following way. In the next section, a short summary of the population projections and housing demand analysis provided by the BBHM is presented for the three towns of interest. This is followed by an analysis of the preferences, needs and current activities of mining workers at the Dawson mine identified from the survey results, helping to inform more precisely the future trends in demands in housing type and location. In section four of the report, some more detailed analysis is presented about how housing demand can be characterised by particular groups of mining employees. In the final sections of the report, some analysis is provided about these issues on policy mechanisms.

SECTION TWO: PREDICTIONS OF THE HOUSING MODEL

The Bowen Basin Regional Housing (BBRH) model outlined in Report 2 (Akbar, Rolfe and Greer 2008) is based on a linear extrapolation of demographic variables and housing types for a township. The model was applied in five different towns in the Bowen Basin region, including three relevant to the case study area surrounding the Dawson Mine. The model predicts some changes in demographic characteristics and housing demand, as described below.

1. *Household and housing changes in Biloela:* The model identifies that demand from one-couple families with children in Biloela will decrease over the next 20 years by 86 units; while there will be increases in one-couple families without children and one parent households over the same period by 213 units; consequently the model predicts increased demand for single unit or townhouse type of dwelling structures and a downward demand for separate dwelling structures. These predictions suggest that Biloela would not need to provide any more separate houses but would need to provide 187 semi-detached houses or units, which is 20 semi-detached houses or units per year, to meet the increasing demand of single or one-couple family without children households (see detail in Table 2.1).

Figure 2.1 Changes in housing demand in coal mining towns in the Bowen Basin region between 2006 and 2026
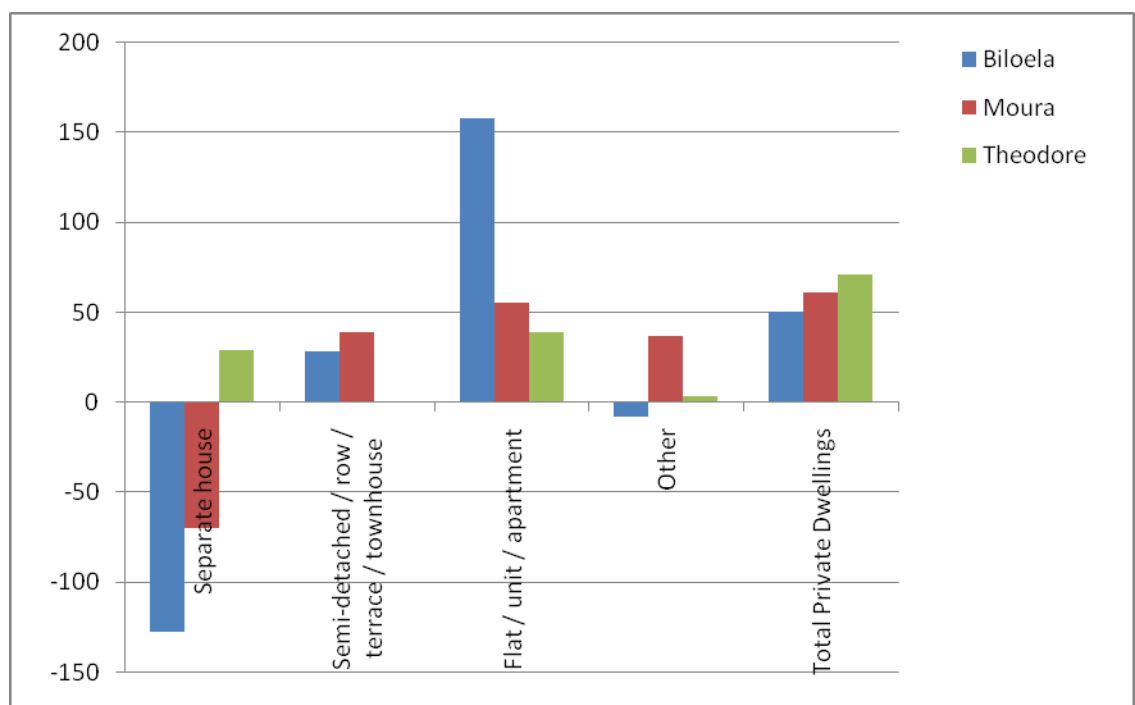
2. *Household and housing changes in Moura*: The model identifies that demand from one-couple families with children in Moura will decrease over the next 20 years by eight units; demand from one-couple families without children will be unchanged and demand from one-parent family and lone person households will increase in the same period by 62 units. Consequently the model predicts an increased demand for single unit or townhouse type of dwelling structures. The demand for total private dwellings is predicted to increase by 61 units between 2006 and 2016. These predictions suggest that Moura would need to provide 94 semi-detached houses or units, which is about 5 semidetached houses or units per year, to meet the increasing demand of single or one-couple family without children households. This town does not need to increase the supply of separate houses.

3. *Household and housing changes in Theodore*: The model identifies that demand from one-couple families with children and other family households will increase over the next 20 years by 22 units; demand from one-parent families will decrease by 12 units, and

demand from one-couple families without children and lone person households will increase over the same period by 40 units. Consequently the model predicts an increased demand for both separate houses and single unit or townhouse type of dwelling structures. The demand for total private dwellings is predicted to increase by 71 units between 2006 and 2026. These predictions suggest that Theodore would need to provide 70 units, which is about 4 units per year, to meet the increasing demand of one-couple family without children and lone person households.

It is important to understand the assumptions underlying these model predictions so that appropriate care is taken in applying the model forecasts for demographic changes and housing demands. A key driver of growth in the Bowen Basin communities over the next two decades will be levels of employment in the mining industry. The predictions of the housing model are based on the extrapolation of demographic and housing data collected in successive Census periods by the Australian Bureau of Statistics. While there is accurate knowledge about past activity, predictions of future trends may be far less rigorous. One step in addressing this deficiency is to ask current mining employees about their future intentions about location and housing choices. This information can help to cross check the predictions from the housing model, and provide some guide as to the likely impacts of ongoing mining activities on regional communities.

Table 2.1 Modelled changes in demographic characteristics and housing demand between 2006 and 2026

	Biloela		Moura		Theodore	
	Number	%	Number	%	Number	%
(A). Population by family type forecast						
One-couple family with children	-383	-14.43	65	7.21	-8	-3.72
One-couple family without children	384	34.16	0	0.00	19	22.62
One parent family	-180	-32.79	-94	-67.14	-25	-52.08
Other family	3	6.25	12	92.31	9	180.00
Unrelated individual living in family household	-14	-33.33	1	16.67	-3	-60.00
Group household member	-37	-26.43	4	23.53	3	21.43
Lone person	-64	-14.78	51	27.27	31	42.47
Persons in private dwellings	-290	-5.81	40	2.47	28	6.31
Persons in non-private dwellings	454	61.68	35	12.96	0	0.00
Total Persons	164	2.86	75	3.97	28	6.31
B). Household by family type forecast						
One-couple family with children households	-86	-14.55	-8	-3.46	13	20.97
One-couple family without children households	189	33.93	0	0.00	9	21.43
One parent family households	24	13.48	5	10.00	-12	-66.67
Other family households	3	15.00	0	0.00	9	180.00
Group households	-15	-39.47	8	42.11	20	125.00

Lone person households	-64	-14.78	57	31.49	31	42.47
Total Households in Private Dwellings	50	2.75	61	9.26	71	33.02
(C). Housing demand by dwelling type						
Separate house	-128	-8.25	-70	-13.78	29	15.68
Semi-detached / row / terrace / townhouse	28	75.68	39	278.57	0	0.00
Flat / unit / apartment	158	86.34	55	196.43	39	205.26
Other	-8	-17.02	37	33.94	3	27.27
Total Private Dwellings	50	2.75	61	9.26	71	33.02
Non-private dwellings including SPQs	454	61.68	35	12.96	0	0.00

SECTION THREE: MOURA CASE STUDY

The Moura case study described in this section was designed to provide some current data on the location and housing intentions of mining employees, thus providing both some indicative data about the future choices of mining employees in the Bowen Basin, as well as helping to validate the accuracy of the Bowen Basin housing model.

3.1 Methodology

3.1.1 Research sample

The research sample comprised of self-selecting Anglo Coal Dawson Mine Complex employees. Both Anglo Coal staff and miners were invited to participate in the survey. Of a known employee population on site of 764 (May 2008) approximately forty two per cent of the employees (n=322) participated in the survey. As shown in Table 3.1 this represented a 6.8 per cent over sampling of miners with a corresponding under sampling of staff.

Table 3.1 Sample breakdown

	Anglo Coal HR data[1]		CQUniversity Miners survey	
	Number	%	Number	%
Staff	192	25.1	59	18.3
Workforce (Miners)	572	74.9	263	81.7
Total	**764**		**322**	

Approximately 22 per cent of the respondents indicated that they were employed by contractors and not directly by Anglo Coal with the remaining 78 per cent directly employed by Anglo Coal.

3.1.2 Data collection

Data collection was undertaken by two experienced ISRD researchers who went to visit Anglo Coal's Dawson mine site in Moura, Central Queensland in May 2007, and distributed the

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[1] Anglo Coal HR data extracted from SEAT 2 data compiled May, 2008 by Anglo Coal

questionnaires amongst the employees (miners and staff) over a three day period. Miners, both Anglo Coal employees and contractors, were contacted at the briefing session before each shift commenced at 6am or 6pm whilst general Anglo Coal staff were contacted throughout the day.

3.1.3 Survey instrument

The survey instrument was a two page single sheet paper questionnaire consisting of sixteen closed and four open-ended questions (See Appendix 1 for survey instrument). The short ten minute survey sought to identify potential work patterns and potential housing demands in the Moura area of Anglo coal employees.

3.1.4 Analysis method

A code frame was set up for data entry. A member of research staff at ISRD completed data entry into Excel in four days and 10% the data entry was validated by another member of staff from CQUniversity to ensure quality of data entry. The data was transferred to SPSS for analysis.

3.2 Survey Results

The survey results are presented in summary form and include the following areas:
- Demographics
- Employment history
- Future work plans
- Current accommodation
- Future housing options
- Segmented analysis

3.2.1 Demographics of Dawson mine employees

The majority of the survey respondents were male (76.5%) which corresponds with the fact that male miners form the major part of the Dawson workforce. However, in the staff group that completed the survey, the proportion of female staff (n=33) were slightly higher than male staff (n=26).

The average age of the workforce at the Dawson Mine Complex for both staff and miners was 37 years (SD=10.9), concentrating around the ages of 28 to 45. Almost 69 per cent of the workforce is either married or in a de facto relationship and 27 percent indicated that they were single or separated. More than half (54.7%) of the employees had children, however of those who indicated that they had children just under half (48%) were not living with the children. Of the total workforce surveyed, 33.2 percent indicated that they were not living with their children[2].

3.2.2 Employment Profile

Anglo Coal employees were asked to indicate how long they had been working:
- within the mining industry,

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[2] Caution should be taken with this statistic as the reasons why the employees were not living with their children was not explored – obvious reasons could be block shift working arrangements, children have left home etc.

- in the Bowen Basin area,
- for Anglo Coal (directly employed),
- for a contractor, and
- at the Dawson Mine Complex.

Across all respondents, around 35 per cent have been working in the mining industry between one and five years, followed by around 20 per cent who have worked between ten and fifteen years in the industry.

Figure 3.1 Years in the industry
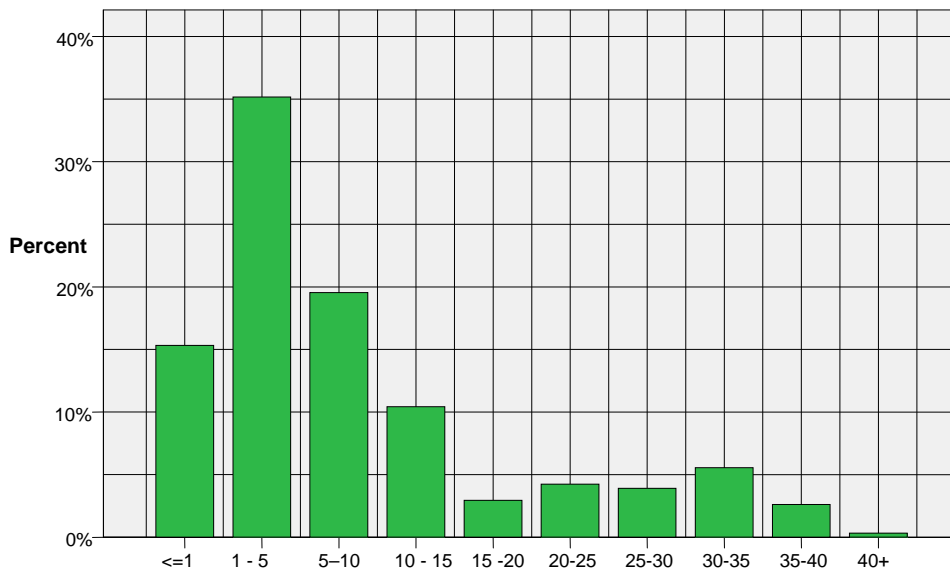
The median time worked at Anglo Coal, contracting and at the Dawson Mine Complex site was about two years. The median length for working in the Bowen Basin is around four years. It should be noted that about ten per cent of the workforce have been working in the Bowen Basin region between 25 and 40 years.

3.2.3 Previous geographical place of employment

A key question in the survey asked respondents where they had worked before taking their position in the Dawson Mine. Looking at the previous place of employment, over 50 per cent of the workforce comes from the Bowen Basin region followed by 20 per cent of the workforce from Central Queensland, and just over 10 per cent from the SE of Queensland and interstate. The results suggest that nearly three-quarters of the workforce are drawn from the Central Queensland region. This pattern helps to explain why mining developments cause subsequent labour shortages in the regional area, as workers tend to be drawn from the local area rather than from outside regions.

Figure 3.2 Prior work place
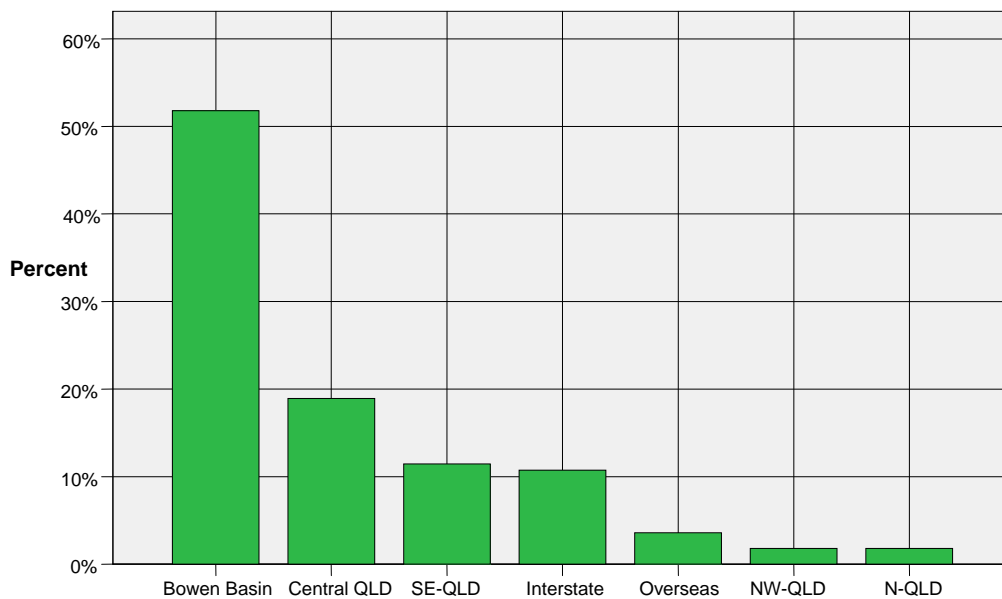
3.2.4 Future work plans

A question about future employment intentions suggests that the mining workforce will tend to be quite stable. Seventy-eight per cent of respondents indicated that they intend working for the mining industry for more than five years[3], while 59 per cent of respondents intend to work at the Dawson mine site for more than five years. The responses differed however between miners and Anglo Coal staff, with miners predominately seeing themselves as staying at the Dawson mine site for longer than five years whereas staff had an almost equal spread for staying from one year through to more than five years.

3.2.5 Current place of main residence

Respondents in the workforce survey were asked to identify which was their main place of residence. The main residence for both miners and staff was Moura (46.6%), followed by Biloela (15%), Rockhampton (8.1%), and smaller communities[4]. The mine workforce was also asked about their current housing arrangements. The dwelling of choice across all towns was 'house ownership', closely followed by renting a house/unit (particularly in Moura). The summary of main residence and housing arrangements is provided in Figure 3.3.

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[3] The question was structured in categories causing the data to end-pile. A numerical question would have perhaps avoided this.

[4] The "Other" category at 13% is made of a diverse range of places and percentages of each are insignificant.

Figure 3.3 Main town of residence by type of dwelling
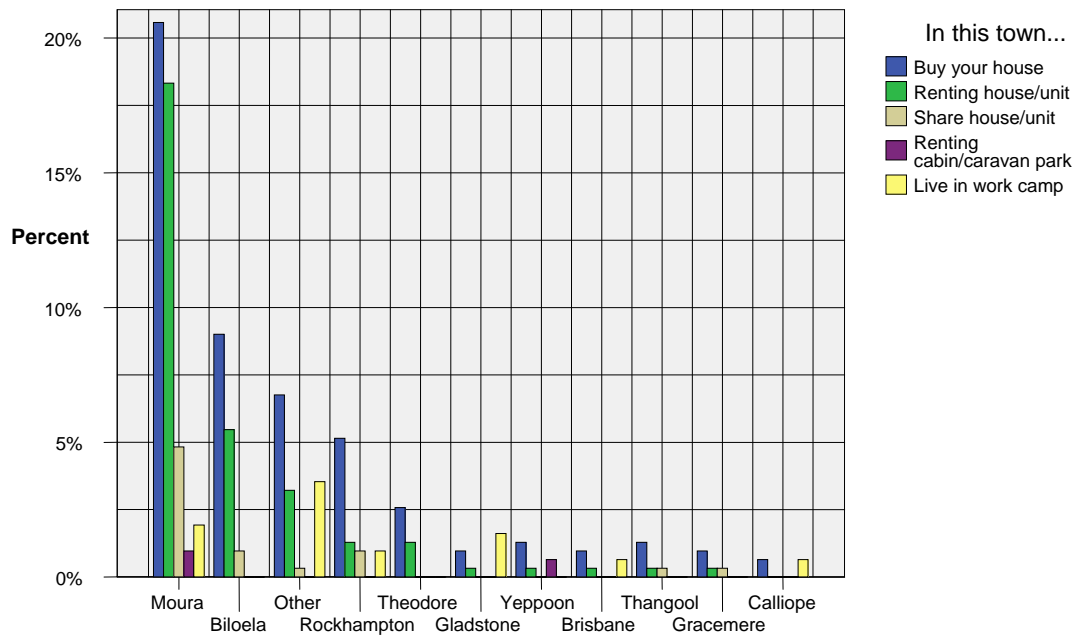
Respondents were also asked for how long they had lived at their main place of residence (Figure 3.4). Most miners had lived at their main residence for more than six years, with another group with a resident length of less than two years likely to reflect more recent growth in employment at the mine. In comparison staff was more likely to have only lived in their main town of residence for a shorter time period, perhaps reflecting a tendency for staff to transfer between different mine sites as a part of management progression. This is supported by information on the type of dwelling, with miners more likely to have their own home and staff more likely to be renting (Figure 3.5), and about their future intentions. When asked about the length of stay in their main residence the miners group expected to stay between three to five years whereas the staff group marginally expects to stay just up to two years.

Figure 3.4. Years at current main residence
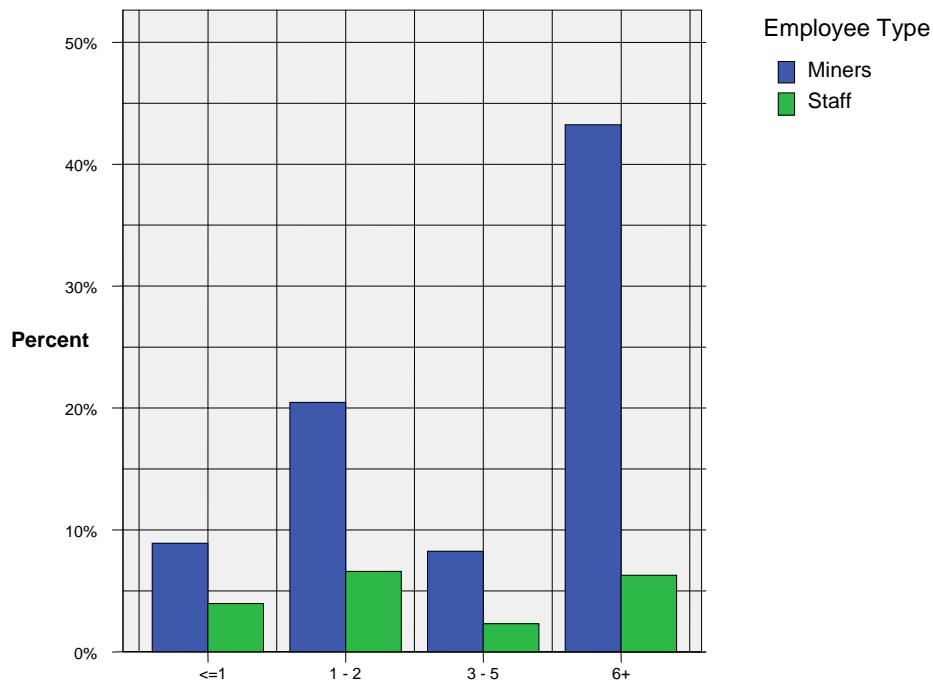
Figure 3.5 Type of dwelling
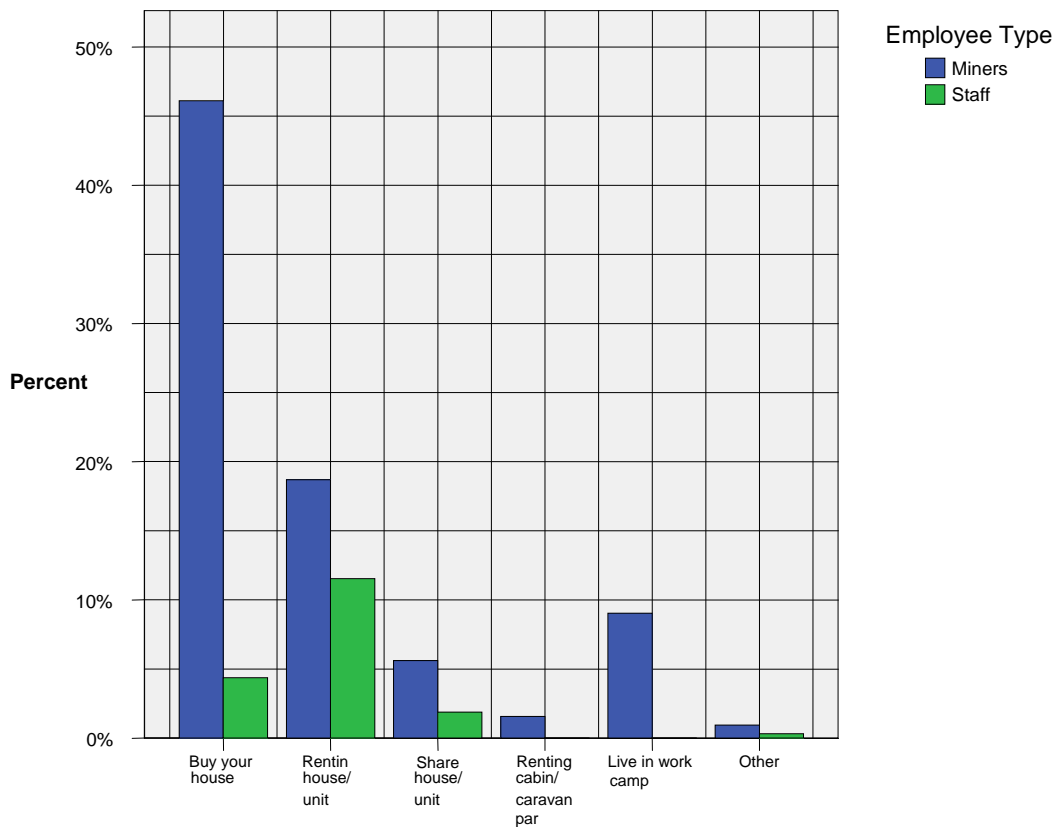
The mining employees were asked why they chose to live in their town of residence (Figure 3.6). For miners, being 'close to the family' and in a 'close town' were the most important reasons,

while for staff, it was the provision of low cost housing by the company that was the dominant reason.

Figure 3.6 Main reasons for living in town of choice
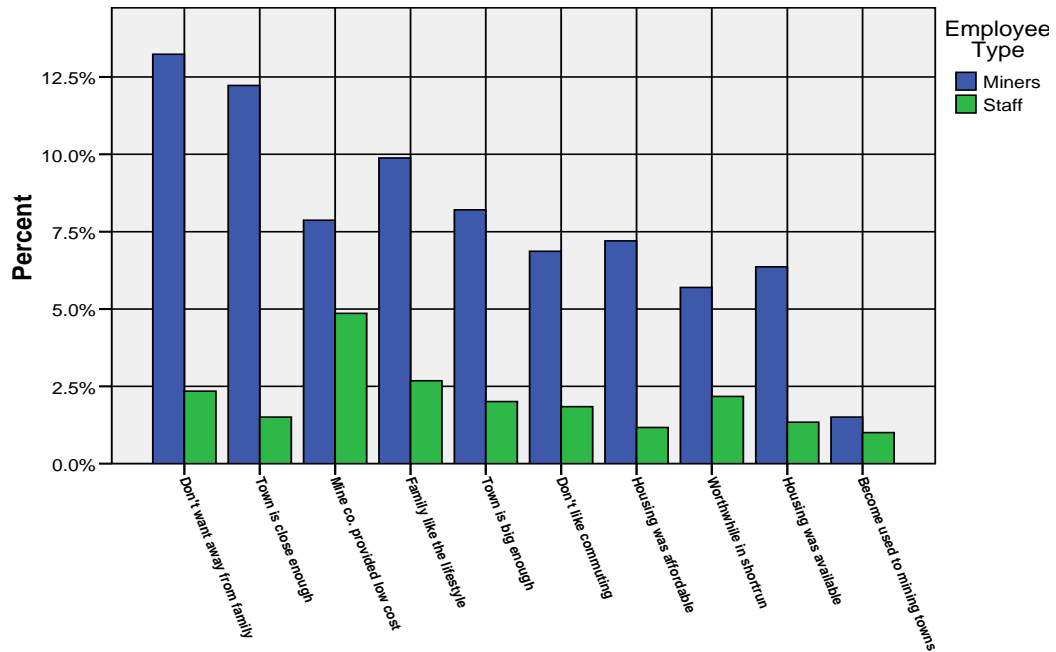
One issue that was tested was whether the mine employees were happy enough with their current town to move to a similar one (Figure 3.7). Both miners and staff appear marginally more willing to move to similar settings in the future.

Figure 3.7 Likelihood to move to similar town in the future
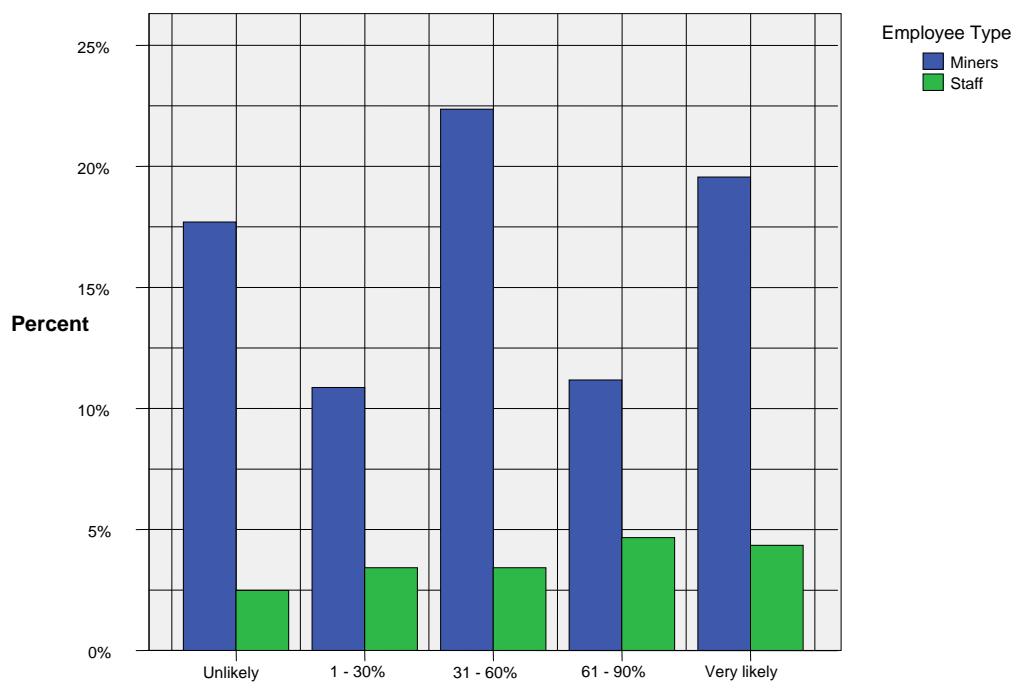
The survey also captured the type of dwelling that employees were occupying whilst working, not being necessarily the main place of residence. Just over half of the respondents live in houses they own (52%) though a fair proportion of miners (28%) live in work camps (Figure 3.8). They were then asked what type of dwelling they would prefer whilst in a working situation (on shift) (Figure 3.9).

Important conclusions can be drawn from the comparisons between current and preferred future work residential arrangements. First, the dominant preference for residential options is for private housing, with future preferences of 68.8 per cent (of responses given) being higher than 52.3 per cent of current occupation. Second, the workcamp arrangements are not preferred, suggesting that if other accommodation options were available, the use of workcamps would diminish. In this survey, 27.7 per cent of respondents for this question said that they were currently using workcamps, but only 12.7 per cent (of responses given) indicated that they would like to in the future. Third, mine employees would also like to move out of shared housing (12% current use to 7% future use) and caravan parks (2.3% current use to 1% future use). These results confirm that there is potential for other accommodation options to be developed to service the mining industry.

Figure 3.8 Current living arrangements whilst at work
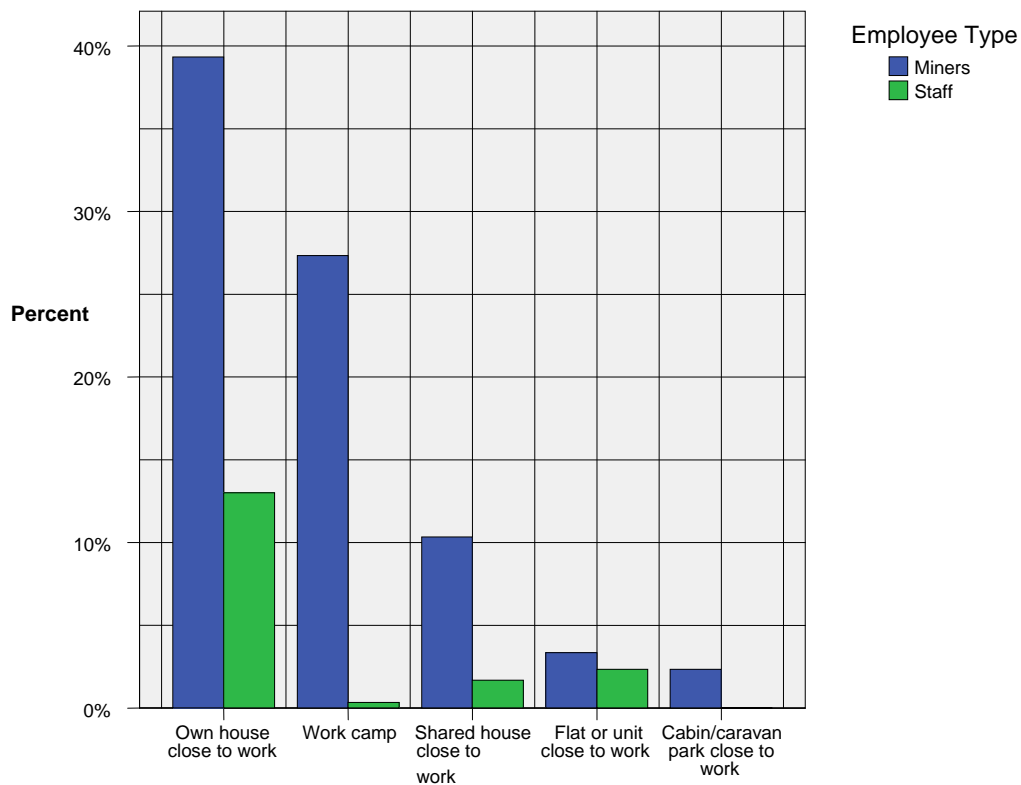
Figure 3.9 Preferred living arrangement whilst at work
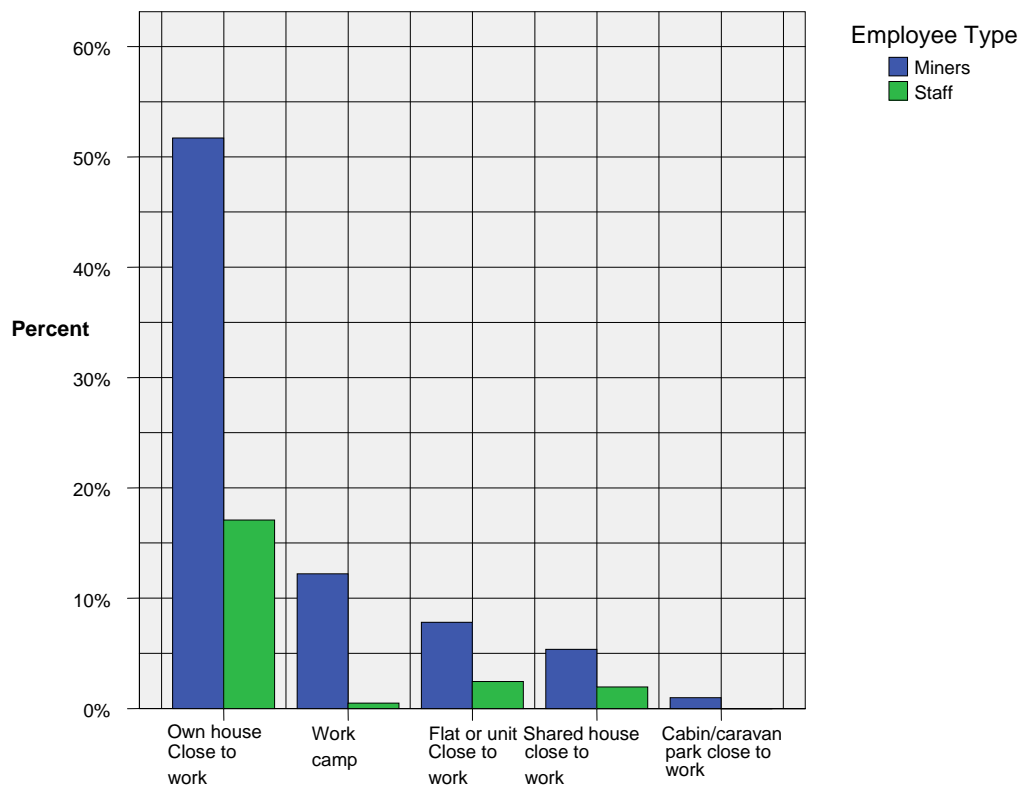
There were several questions in the survey about options and barriers to relocation. When mine employees were asked whether they would move their main place of residence closer to the mine site, 68 per cent answered with no. Those that answered with "no" were further asked about the reasons for not moving closer. The major reasons identified for not doing so was high house prices (22%) followed by reasons such as lack of recreational facilities (15%) and lack of services (13%) (Figure 3.10). When the reasons are classified into broad groups, the following groups can be identified in rough order of importance:

- High housing prices
- Lifestyle reasons (recreation, services, family preferences)
- Job and Service availability
- Housing availability

This information suggests that simply providing extra housing and services may not be sufficient to attract an additional proportion of the workforce to live in mining towns. Addressing housing costs and ensuring lifestyle benefits are available may be more important drivers of relocation choices.

Figure 3.10 Reason for not moving closer to mine site
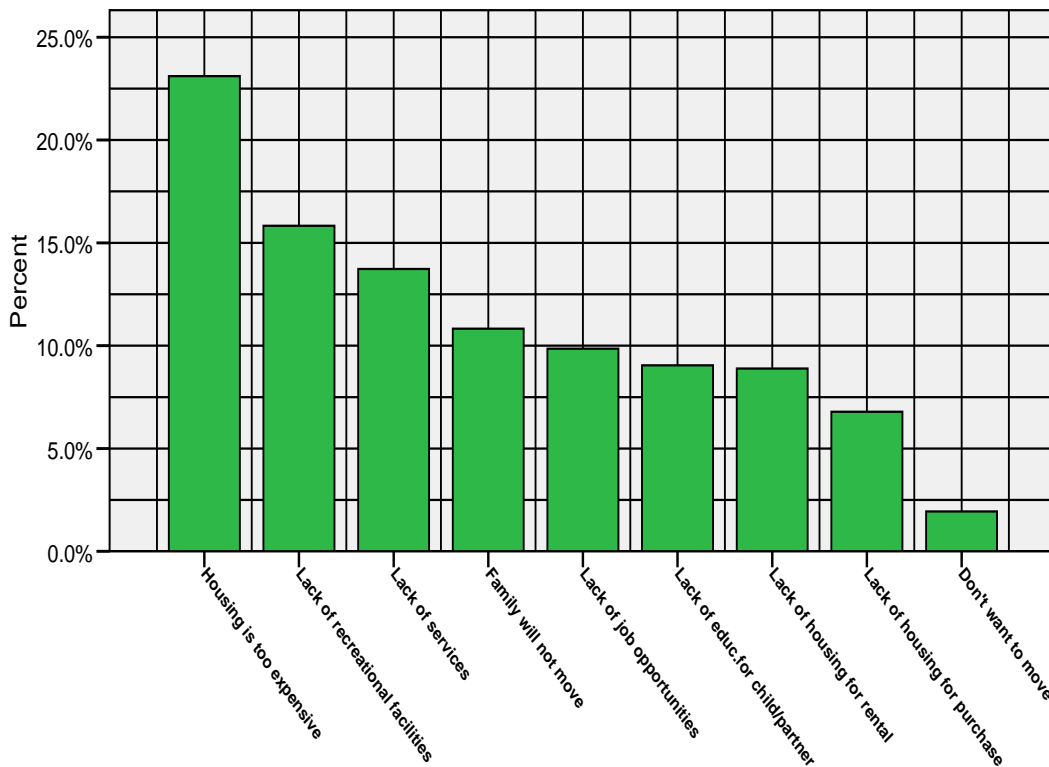
3.2.6 Preferred Place of Residence

Another question in the survey focused on the preferred main place of residence if a job in another mining town were offered (Figure 3.11). Around 29 per cent of the total sample would prefer to live in the same town that they live in now, suggesting that 71 per cent of the sample are amenable to relocation at some future time. For that group, the preferred option was to live in a 'small town close to work' (22%). It is notable that this group found it preferable to live a 'small town close to work' rather than a 'large town close to work', and 'somewhere on the coast' rather than in a 'larger town'. This is at odds with many demographic trends of population consolidation into larger communities, but may reflect the origins of the bulk of the workforce in Bowen Basin and Central Queensland communities.

Of those respondents that would prefer to live in a small/large town that was close to where they worked, the survey asked what would be the acceptable maximum time to work travelled by car one way. For those who prefer to live in a small town close by, a median travelling time of 30 minutes would be acceptable. For those who prefer to live in a larger town, a median travelling time of 45 minutes would be acceptable. This information provides some guide as to the limits between work places and residential locations for future developments.

Figure 3.10 Preferred place of residence if had to move to another mining town
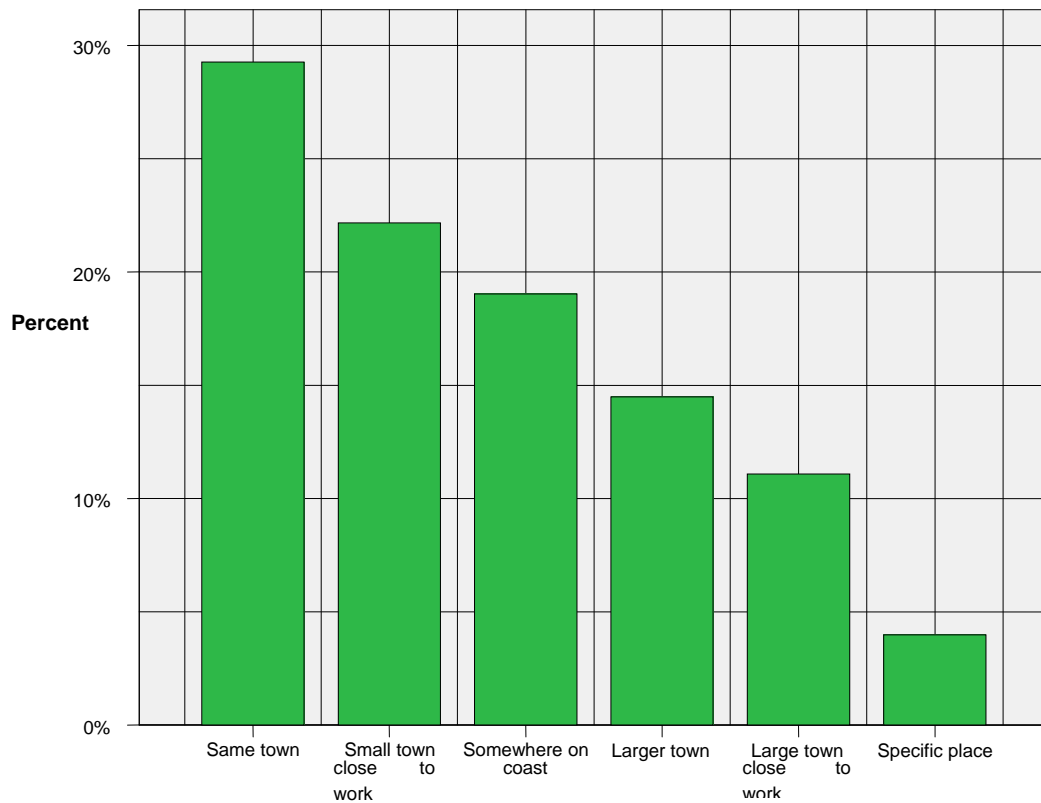
An important function of the data collection was to assess preferences for the type of housing that people wanted. When asked about the preferred type of dwelling, 68 per cent of the total sample preferred to live in a three bedroom or larger house on a large block (Figure 3.12). Around 14 per cent would like to live on a three bedroom or larger house or unit (on a standard or smaller block), with a much smaller percentage indicating preferences for smaller houses, duplexes and units. These preferences for housing differ from projected housing needs. Although the population modelling (and the preferences of work camp residents) suggests that there will be increased demand for accommodation for single persons and couples without children, the dominant preferences are to have larger houses on larger blocks, or medium size houses on standard blocks. Although housing preferences may be tempered by price considerations, the results suggest that the model projections for housing demand should be weighted more highly for housing stocks.

Figure 3.12 Preferred type of housing
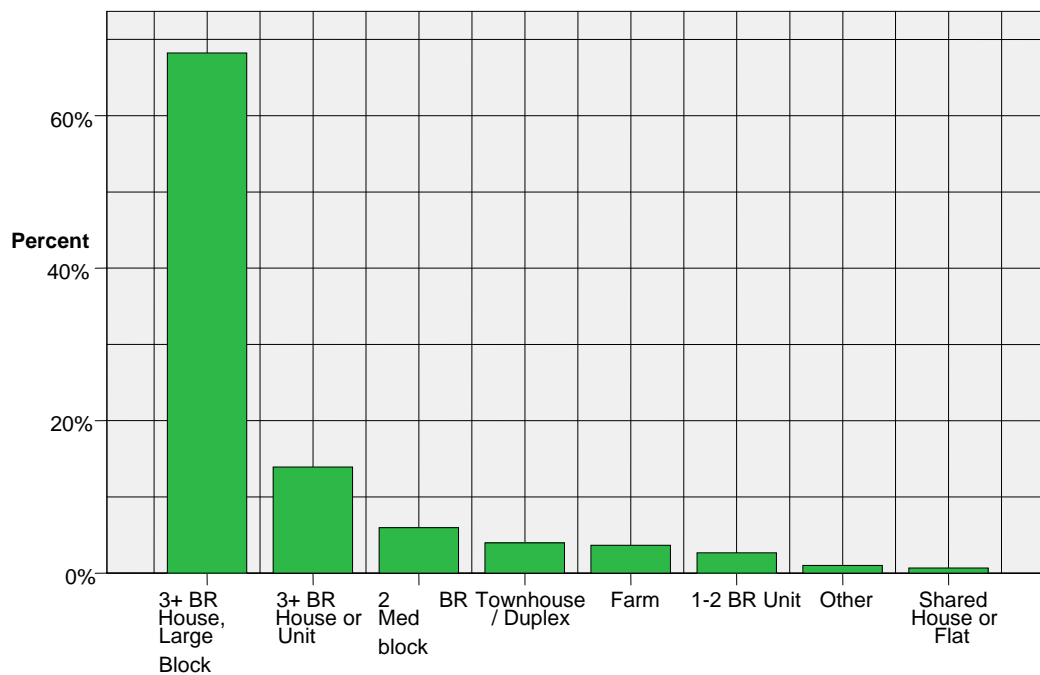
3.2.7 Importance of relocation factors

Factors that were important to mine employees in relation to their location choices were assessed by asking respondents what would be important to them if they were offered a job in a different location in the coming year. Respondents were asked to rate each factor in the question on a five point scale in terms of its importance to them (Figure 3.13). An important feature to note is that a number of these items seem to contradict each other, and that would be the case if the scores shown were in the importance given by all individuals; whereas respondents in reality often only rate a few of the items as important. Grouping the data in this way is good for knowing the *range* of key issues, but reveals little of the contingent arrangements among groups of individuals. The segmented data in Section Four will reveal more of the differing groupings of items of importance to different segments of the workforce.

On average (Figure 3.13), working in a stimulating job, working in a supportive company environment, having an increased salary, being somewhere that suited the family, getting home each day and having regular hours were the highest rating issues when considering a job in a different location in the next year. Having block work periods was seen less important, particularly for staff.

Figure 3.13 Importance of issues to the workforce
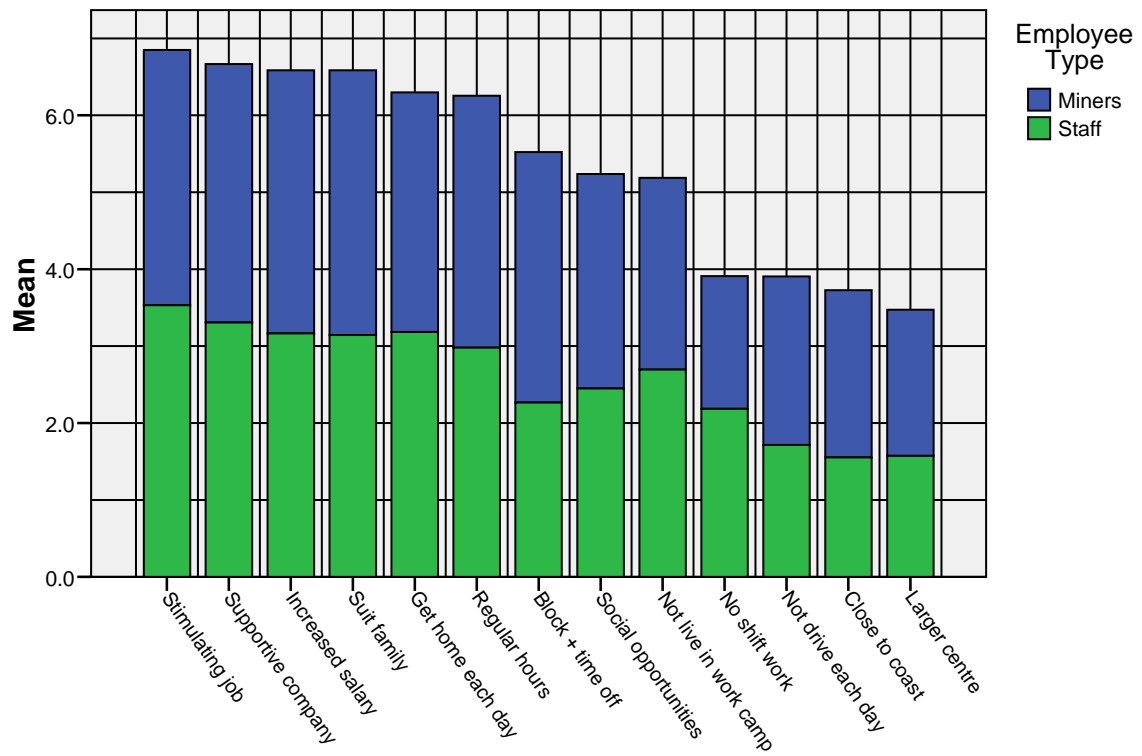
SECTION FOUR: PREFERENCES AMONG GROUPS OF EMPLOYEES

4.1 Segmenting to predict behaviour

In this section of the analysis, data on housing demand from underlying groups of mine employees is reported. The miner's survey data was evaluated to determine if there were particular groups of respondents who might have different housing needs. The categorisation of mine employees into groups provided an important way of summarising mine employee's attitudes and behaviours towards housing. Within the survey one set of five questions collected a number of psychographic measures. These were derived from the internationally accepted Schwartz Values Scale (Schwartz 1992, Schwartz and Boehnke 2004). The researchers developing this scale propose that long term and enduring goals and aspirations brought about by a number of key dimensions of motivations are inherent in all people.

These key dimensions are aligned through a number of high order values that have relevance to individual differences of people within their cultural settings. The five motivations collected in the miners' survey were hedonism, security, benevolence and tradition, power orientation and universalism. These five motivational scores were optimally scaled through the process of generalised Euclidean individual differences scaling (Bentler and Weeks 1978); producing scores which were used for rotating the motivational values into high order dimensions (Schwartz and Boehnke 2004) . The high order dimensions retrieved from the data in this way were:

- Affective autonomy vs. Embeddedness,
- Egalitarianism vs. Hierarchy, and
- Master vs. Harmony.

Embedded individuals are those who view themselves as embedded in the collectivity of their culture. ***Affective autonomy individuals*** find meaning in their own uniqueness and are encouraged to express their preferences, feelings and desires. ***Egalitarian individuals*** recognise one another as equals and feel concern for the welfare of others. ***Hierarchy individuals*** on the other hand are individuals who feel the need to engage in productive work, necessary to maintain society. It also defines willingness to accept an unequal distribution of power as legitimate. ***Mastery individuals*** are oriented along self-assertion and are happy to change the natural and social environment to attain personal goals. ***Harmony individuals*** hold the opposite view and accept the world as it is, trying to understand rather than to change or exploit. This orientation also emphasises being harmonious with the environment.

4.2 The segments

Subsequent to the development of the high order dimensions, the researchers clustered the mining workers using the categorical data of gender, family status, employee type and the quantitative dimensional data from the Schwartz Values Scale to produce segments which contained both descriptive and explanatory data. A two step clustering process, defined by the categorical variables first and then with the continuous values variables, defined three workforce segments (Figure 4.1) using standard Bayesian information criterion (Bentler and Weeks 1978).

1. "Focused female staffers" comprised mostly staff, mostly female, who consider Hedonism less important than the other two groups
2. " Empowered Single Young Guys", are mostly younger and single male miners who rate their success and ambition more important than the other groups
3. "Married good-time guys" are mostly married male miners who rate both "a fair go for all" and "enjoying life's pleasures" more important than the other two groups.

Figure 4.1 Segments
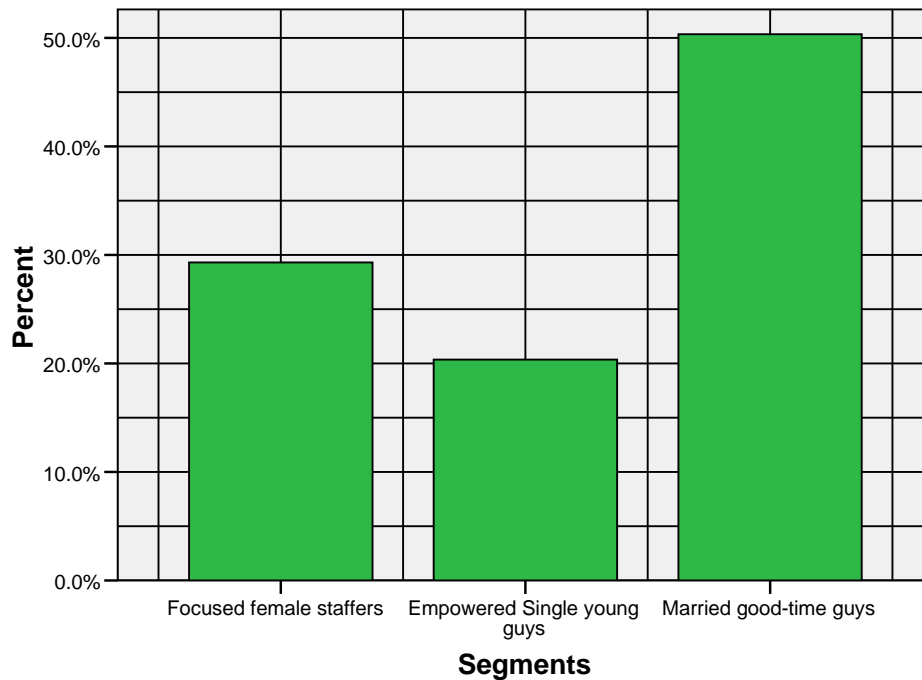
4.3 Segment comparisons of housing preferences

These segments have been cross tabulated with other groups of variables in order to predict various issues for future housing choice. With relation to current dwelling arrangements whilst on shift at the mine (Figure 4.2), married good-time guys are dominant in house ownership and work camps, while the focused female staffers are predominantly renters as well as having houses provided by mining companies. Empowered single young guys are the largest group in house sharing arrangements. Preferred dwelling while on shift shows that whilst the empowered single young guys represented only 34 per cent of house ownership currently, given the opportunity, 61 per cent would prefer to live in their own house. This 27 per cent of empowered single young guy's unmet need for house ownership is largely accounted for their stated preference for not staying in a work camp, which falls 20 per cent from their current arrangement. The fall off from current numbers to preferred numbers dwelling in work camps amongst the three groups – if the opportunity existed – would effectively halve the number of those that currently reside in them. However as noted previously at Chapter 3.25 and Figure 3.10, the reasons given by mining employees for not moving into a nearby town are diverse and difficult to resolve in there entirety.

Figure 4.2 Current vs. preferred dwelling by mine employee segments (NB 3 x 100% ea.)
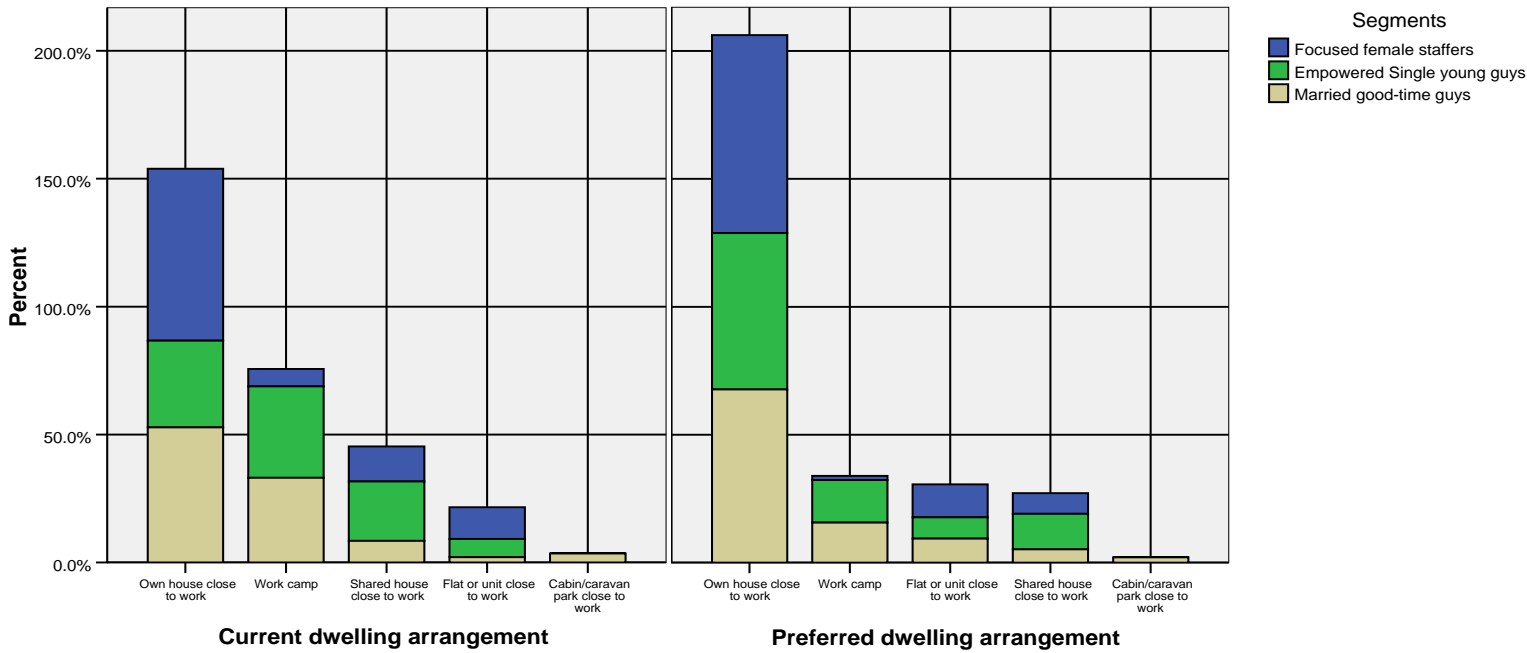
Two thirds of focused female staffers are already currently living in their own house, but here there is an unmet need for another 10 per cent in house ownership, swelling to 77 per cent of their stated preference. Fifteen percent of the married good-time guys would like to change the dwelling arrangement to house ownership if they could, growing from 53 per cent to 68 per cent.

4.4 Segment comparisons of location preferences

Both *focused female staffers* and *married good-time guys* would prefer to live locally, close to the mine site (Figure 4.3). The *single young guys* indicate a preference for regional hub and coastal centre location. Across all three segments there is an equal secondary preference for living in a major coastal town.

Figure 4.3 Preferred location by mine employee segments

Preferred main residence
- Major metropolitan
- Major coastal town
- Regional hub
- Small Coastal town
- Nearby local town
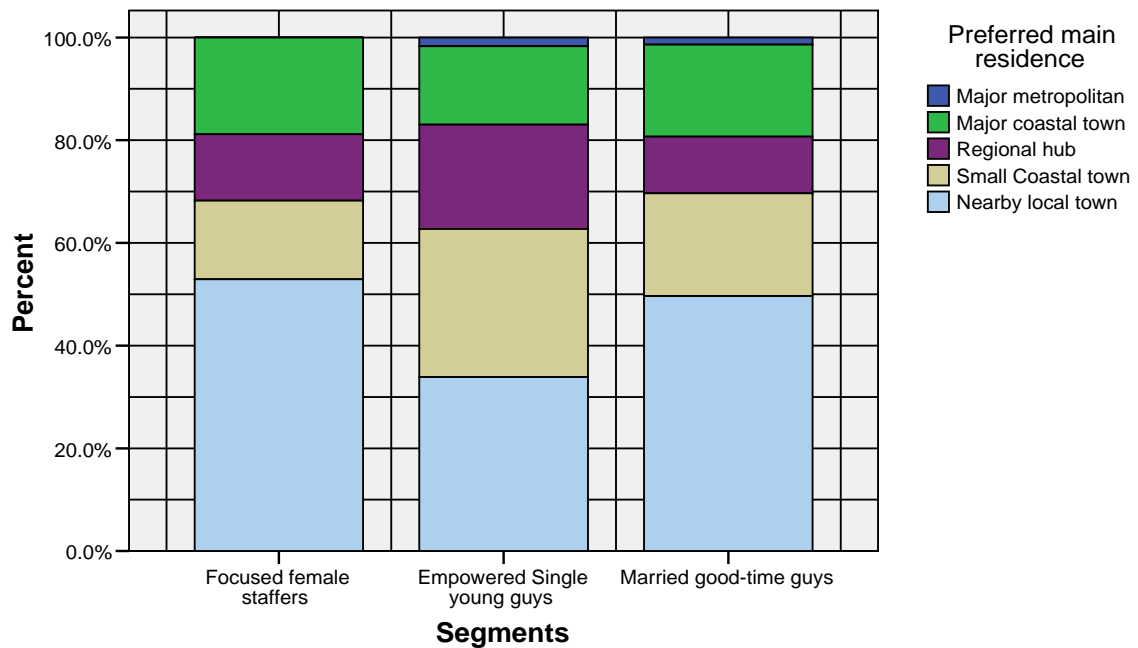
4.5 Segment comparisons of house type preferences

When evaluated for preferences for housing type, all three groups prefer a three or more bedroom house situated on a large block, although the *Married good-time guys* show the largest preference for large houses between the groups. *Empowered single young guys* are marginally more interested in large properties than *Focused female staffers*.

Figure 4.4 Preferred type of dwelling by segments

Preferred residence type
- Farm
- Shared
- 1-2 BR Unit
- TownH / Duplex
- 2 BRH med Bl
- 3+ BRH or U
- 3+ BRH LrgBl
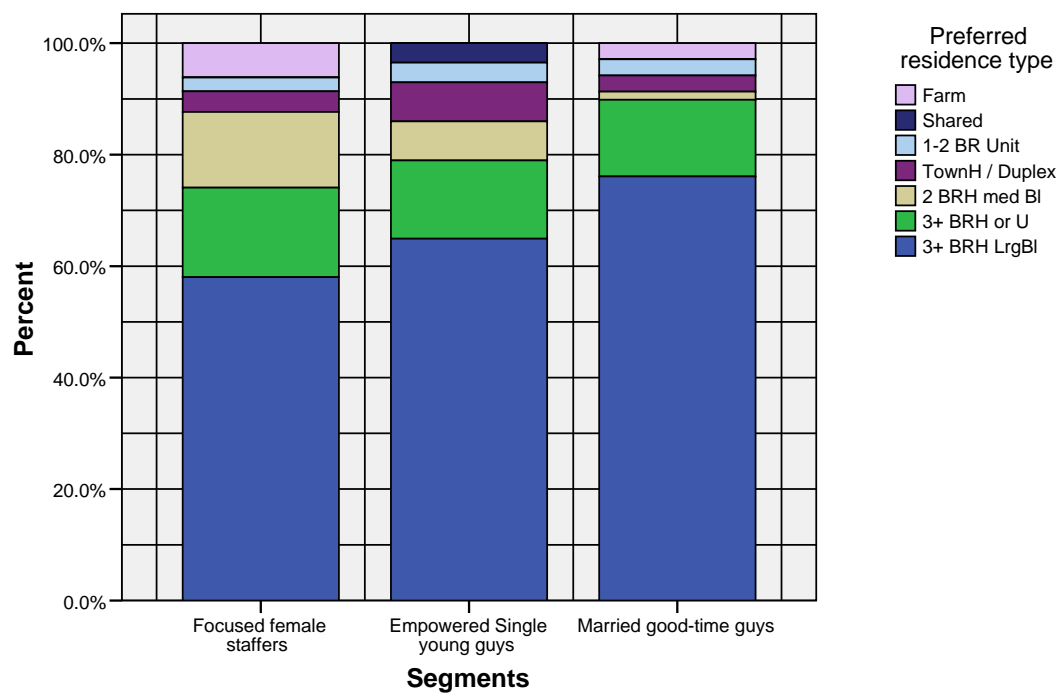
4.6 The importance of issues related to future work by segments

One key issue is whether the factors that are important for mine employees in their work and location choices differ between the three identified groups. The following segment based analyses show the relative importance of each of the issues in order of magnitude; with a negative direction showing that a lower importance given to this issue than the other two segments. Although all of the items are significant in their own right at the standard five percent confidence level, there is an additional statistic included here, which is significance of difference to the other segments. A value of two in either direction indicates a significant difference in importance between the groups. *Married good time guys* treat a lot of items as important, but differ significantly from the others regarding the 'location of future work would have to suit the family', and 'having regular work hours'. The numbers relate to the *t statistic* of the variable importance between groups.

Figure 4.5.1 Future workplace issues by segment – *Married good time guys*
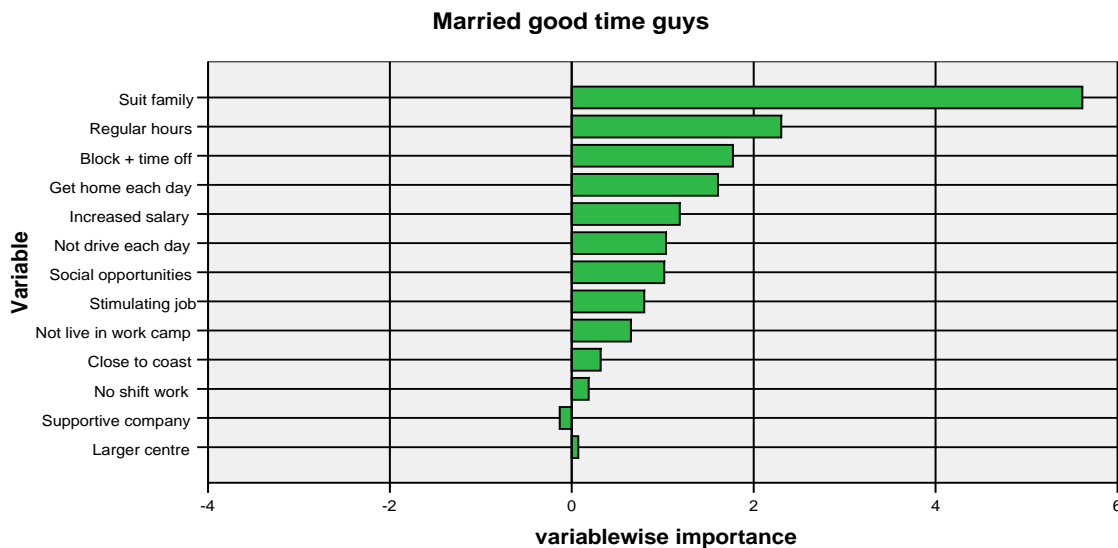
Empowered single young guys on the other hand, are significant in their importance rating of 'being close to the coast' and 'block work periods and then time off'. They are also interested in 'increased salary', 'living in a larger centre' and these are marginally higher than the other groups; and they rate having 'social opportunities' equally important as *Married good time guys.* Although 'being somewhere that suited the family' is somewhat important to *Empowered single young guys*, relatively the score is significantly low compared with the Married good time guys who rate this issue highest of all. A 'stimulating job' and 'not living in a work camp' were also significantly lower.

Figure 4.5.2 Future workplace issues by segment – *Empowered single young guys*

Empowered single young guys
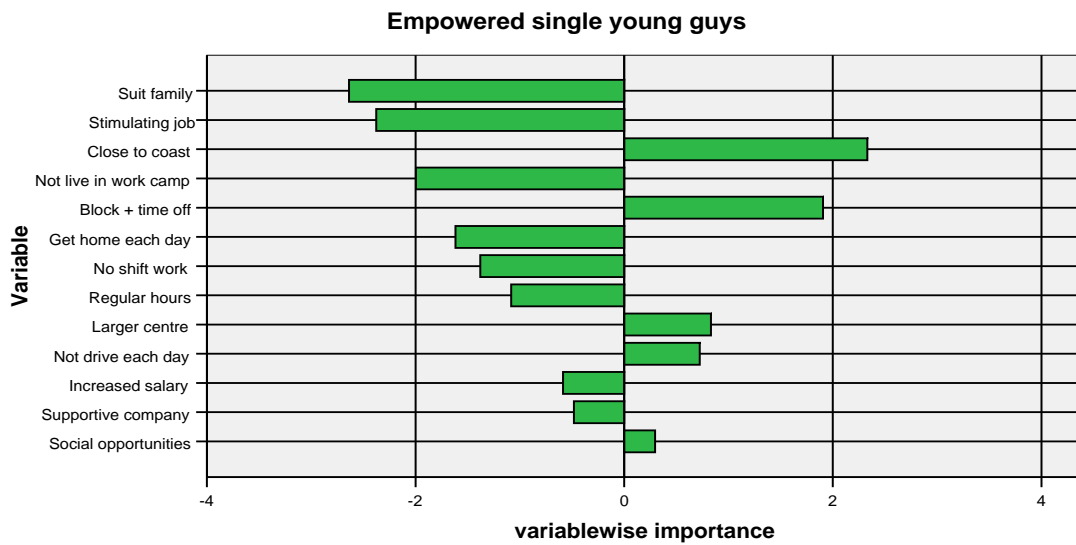
Focused female staffers are focused on the qualities of their workplace and rate the issues that speak of the kind of relationships they will have in the new workplace. Relative to the other groups Focused female staffers rated that 'the work environment must be stimulating and supportive', that it 'not entail shiftwork', and that the job 'not require living in a work camp'.

Figure 4.5.3 Future workplace issues by segment – *Focused female staffers*

Focused female staffers
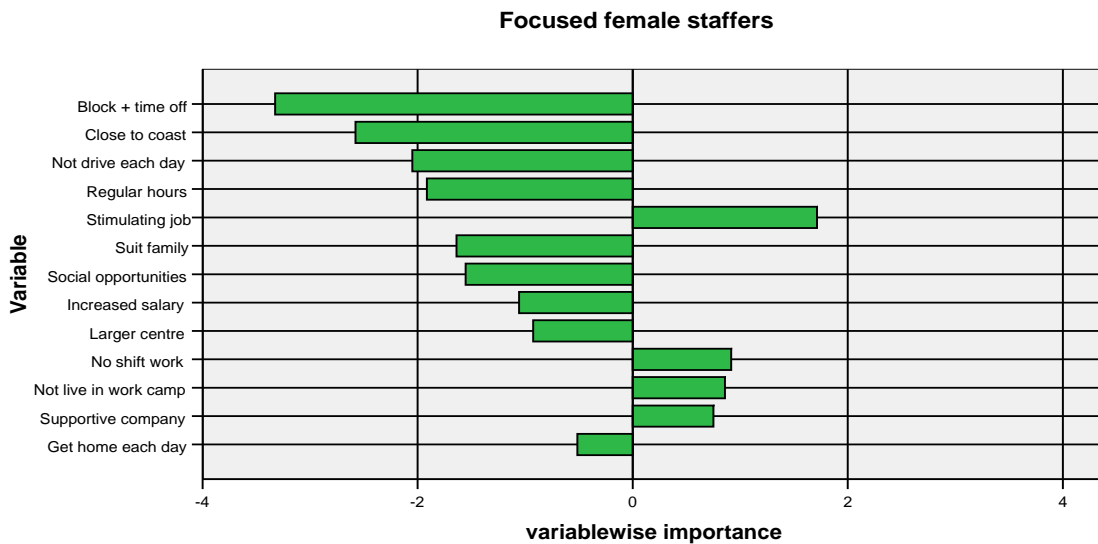
4.7 Conclusion

The short Schwartz survey instrument was designed to be manageable by those who may be unused or uncomfortable with abstract concepts like values (Lindeman & Verkasalo 2005). The segments identified in this study are based on stable categorical data from demographic and psychosocial variables shown to be enduring and more reliably linked to behaviours than attitudes or beliefs (Rokeach 1973). From previous research, it is expected that the segmentation model will

endure a minimum of two years. However this case study of mining company employees, though insightful, does have obvious limitations. Every mining operation is so highly nuanced that announcing this segmentation model to be generalisable across the Bowen Basin would at this stage be inadvisable. Confirmatory research is advised to see if the patterns of segmentation and associated demands are consistent across different mines.

SECTION FIVE: POLICY RECOMMENDATIONS

5.1 Policy Goal and Scope

One of the main policy goals of the project is to provide some strategic guidelines to give direction for the current housing policy in the Bowen Basin region. Policy issues related to housing in the Bowen Basin are considered in two main groups: short term strategies and long term strategies. A short term strategy refers to an action plan for one to five year period, and is largely focused on addressing constraints in the supply of housing, and in dealing with some of the consequences of housing shortages and higher housing prices. Longer term strategies tend to focus more on regional planning issues, where considerations about managing population location and growth (and hence housing demand) and infrastructure planning and provision are more feasible. Long term strategies can be between five to twenty years or more and work with an appropriate degree of flexibility in adopting future changes in practice.

5.2. Recommendations for Short Term Strategies

Short term strategies to address housing issues in the Bowen Basin can be summarised into four key areas:
* Address supply constraints
* Have an appropriate mix of housing
* Address workcamp issues
* Address adverse social impacts

Addressing supply constraints is critical because the consequences of reduced housing availability and higher housing prices have both negative economic and social consequences on regional communities. Solving supply bottlenecks will help to minimise the adverse problems generated by higher housing prices. There are a number of reasons why housing shortages emerge, many of them varying across communities, so a multifaceted and tailored approach will often be required to address the constraints. Important steps are to:
* Identify housing needs associated with both population dynamics and industry developments,
* Address any constraints to housing development (such as land availability or approval processes)
* Provide appropriate information and stimulus mechanisms to ensure housing development,
* Tailor housing supply to the needs of particular groups within communities.

Having an appropriate mix of housing is important in mining communities because there has traditionally been a bimodal pattern of development between the standard 3-4 bedroom houses

and workcamp/temporary accommodation. Housing models predict for almost all mining towns that the current stock of housing does not cater for future population needs, with a more diverse range of housing required to suit accommodation requirements for single person and couples without children households. However, the results from the mining employee survey suggest some tension exists between the housing preferences (largely focused on having larger, separate housing) and housing needs (smaller, more concentrated housing). This helps to explain why private developers continue to focus on standard housing estates. More detailed town planning and engagement between local government, housing developers and the mining industry may be required to ensure more diversity in housing development is generated.

Addressing workcamp development is a critical issue for many regional communities. The results of this study confirm that workcamps have a role in housing mine workers in both the short term and long term, but that **the demand for workcamps is lower in the long term as compared to the short term**. This means that planning for workcamp development should consider three key issues:

1. Identification of the short term needs for workcamps. This will depend on factors such as the requirements and availability of labour, available housing stocks and the need to avoid adverse impacts on local housing markets. Increasing the supply of workcamps in the short term may be an important strategy in the short term to minimise impacts on housing markets, but may have unintended consequences if lower house prices do not stimulate increased building activity to address future supply constraints.

2. Identification of the longer term needs for workcamps. Evidence from this study show that the proportion of the mining workforce that wishes to utilise workcamps over the longer term will depend on a number of factors such as the type of workforce employed and the cost of housing in the local area. As well, attention should be paid to planning and design requirements for workcamps if they are for longer term rather than short term accommodation needs.

3. The transition from workcamp accommodation to other housing options in a community. Key issues here is to ensure that appropriate housing options are developed in a community, and that other alternatives to workcamps, such as shared housing, do not generate other adverse impacts on communities.

Addressing adverse social impacts is important to minimise negative consequences of increased mining developments. Examples of strategic actions to minimise impacts in the short term might include support for elderly or disadvantaged people who have to pay higher rents, and the provision of low-cost housing for students and apprentices. These support mechanisms should normally be short term solutions to address impacts while some imbalance exists between supply and demand of housing stocks.

5.3. Recommendations for Longer Term Strategies

Longer term strategies to address housing issues in the Bowen Basin can be summarised into five key areas:
- Identify preferred development models for communities, with a view to building a sustainable population base over time,

- Design strategies to focus population growth and development in appropriate patterns
- Ensure that infrastructure and services are available for community development in a timely manner,
- Encourage the appropriate development of services and lifestyle opportunities in communities to encourage appropriate population growth,
- Tailor planning schemes and housing development to meet the longer term needs of communities.

Identifying preferred development models for communities is important because it allows communities to identify their own development patterns and identify. It also recognises that development paths will vary between communities, with some evolving into regional hubs and others into service communities for particular industries and lifestyles.

Designing strategies to focus population growth and development provides recognition that some level of regional planning is important to ensure that communities remain sustainable over the longer term. In areas where mining activities will only be short term operations the use of workcamps and temporary accommodation may be more realistic than having a permanent workforce located nearby. In other areas it may be more sustainable to concentrate population and services in fewer, but larger centres rather than spread them across a number of smaller townships.

Ensuring that infrastructure and services are available for community development is critical to attracting population in the longer term. It is also important in stimulating housing construction from the private sector, and can help to lead and focus new housing developments.

Encouraging the appropriate development of services and lifestyle opportunities is critical for regional communities to both attract and retain population. The higher incomes, increased mobility and increased employment flexibility of mining employees means that there is no guarantee that a workforce will locate in nearby towns. To encourage longer term development and confidence in housing development, regional towns will need to attractive as a population base.

Tailoring planning schemes and housing developments to meet the longer term needs of communities recognises that housing stocks have been developed to meet the past needs of communities, and may not be sufficient for future requirements or for new industry or workforce patterns. Active review, planning and engagement is required to ensure that housing development is diversified and appropriate to meet future needs, and is consistent with the longer term strategic needs of the relevant communities.

SECTION SIX: CONCLUSION

The housing issues in the Bowen Basin region have been driven by a number of different factors, including the rapid expansion of new mining developments with associated increases in the mining workforce, the limited stock of housing and slow adjustment in many communities, and increased workforce mobility, prompted in part by changes to block shift operations in the mines. Housing markets are a key transmission factor where the benefits of mining growth can generate offsetting social and economic pressures on regional communities. Addressing housing issues is therefore an essential step in ensuring that local communities gain net benefits from expansions in mining operations.

The research detailed in this report has involved a case study comparison between a model of future housing demands and data from mining employees for the same communities about their preferred location and housing options. The case study focus has been the impacts of the Dawson Mine on the nearby communities of Moura, Biloela and Theodore. Together with material from other stages of the research project, this allows some conclusions to be drawn about the key priorities for housing policy.

The housing model generated for the three towns identified future development pressures, predicting that the current housing stocks were likely to be inadequate to meet future demands of single person and couples without children households. The implications of the model were that more attention needs to be placed on developing flats, duplexes and other high-density dwellings.

This information was then compared to survey results for mine employees at the Dawson Mine. The results show that mine employees mostly come from the central Queensland region, largely expect to remain at the mine and in the local area for several years, and prefer living in larger houses rather than smaller accommodation units. There are three key results of the survey that can be highlighted. First, the demands for shared accommodation units such as workcamps, shared housing and caravan parks are much higher in the short term than in the longer term. This has implications for transitioning parts of the workforce between types of accommodation.

Second, the longer term demands for accommodation are focused on medium to larger sized housing. Here, the preferences of the mine workforce for housing contrast with the modelled needs of the workforce when household size is taken into account. Managing the interface between preferences and needs will be an ongoing challenge for planning and development. Third, the needs and preferences of the mine workforce can be usefully categorised into groups, showing that preferences for housing will vary systematically according to the composition of the workforce. This helps to explain how the demands for housing will vary between mining operations and over time according to different workforce mixes.

The results of the research project allow for recommendations for housing policy in the Bowen Basin to be made at two key levels:

Important steps in the short term to address housing pressures are to:

- Identify housing needs associated with both population dynamics and industry developments,
- Address any constraints to housing development (such as land availability or approval processes)
- Provide appropriate information and stimulus mechanisms to ensure housing development,
- Tailor housing supply to the needs of particular groups within communities

Longer term strategies to address housing issues in the Bowen Basin can be summarised into five key areas:
- Identify preferred development models for communities, with a view to building a sustainable population base over time,
- Design strategies to focus population growth and development in appropriate patterns
- Ensure that infrastructure and services are available for community development in a timely manner,
- Encourage the appropriate development of services and lifestyle opportunities in communities to encourage appropriate population growth,
- Tailor planning schemes and housing development to meet the longer term needs of communities.

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APPENDIX ONE: RESEARCH INSTRUMENT

ISRD227 'Ensuring Sustainable Benefits from Boom Periods: A case study for a long term housing policy in the Bowen Basin'.

Housing Survey – Dawson mine - *Institute for Sustainable Regional Development (ISRD), CQU.*
The purpose of this questionnaire is to identify potential work patterns and housing demands in this area

Q 1: How long have you been working:

(a) For the mining industry? _____Years
(b) For Anglo Coal (directly employed)_____Years
(c) For a contractor (not directly employed by AngloCoal)_____Years
(d) In the Bowen Basin area _____Years
(e) At this mine site _____Years

Q 2: What location or town were you working at before you took this position with Anglo? _____

Q 3: How much longer do you think you will work in the mining industry?

(a) Less than a year ☐
(b) One or two years ☐
(c) Three to five years ☐
(d) More than five years ☐

Q 4: How much longer do you think you will work in this area around Dawson mine?

(a) Less than a year ☐
(b) One or two years ☐
(c) Three to five years ☐
(d) More than five years ☐

Q 5: What is your main town of residence?

(a) Moura ☐
(b) Biloela ☐
(c) Banana ☐
(d) Theodore ☐
(e) Baralaba ☐
(f) Gladstone ☐
(g) Calliope ☐
(h) Other ☐
If "Other", please specify _____

Q 6: How long have you lived in this town (Q5)? _____ years

Q 7: In this town (Q5),

(a) Did you buy your house? ☐
(b) Are you renting a house/unit? ☐
(c) Do you share a house/unit? ☐
(d) Are you renting a cabin or live in caravan park? ☐
(e) Do you live in a work-camp? ☐

Q 8: What are the main reasons why you choose to live in this town? (Please tick the three most important reasons)

(a) The mining company provided low cost housing ☐
(b) Housing was affordable ☐

(c) Housing was available ☐
(c) Don't like commuting ☐
(d) Don't want to be away from the family ☐
(e) Gotten used to living in mining towns ☐
(f) Family like the lifestyle in this town ☐
(g) Town is big enough to have most of the services ☐
(h)Town is close enough to the coast to be convenient ☐
(i) It was worthwhile to live in this town for a few years ☐

Q 9: How long do you expect that you (and your family) will continue to live in this town?
_____ Years

Q 10: How likely is it that you and your family would move to a similar town in the future if you got offered a job in another location?

I estimate it would be _____% Likely

Q 11: While at work in your current situation:

Where do you live? **Would prefer to live?**

(a) In a work-camp ☐ ☐
(b) In a shared house in town close to work ☐ ☐
(c) In your own house in town close to work ☐ ☐
(d) In a flat or unit in town close to work ☐ ☐
(e) In a cabin or caravan park close to work ☐ ☐

Q 12. Would you like to move your main place of residence (where you live when not working) to a town closer to the mine site?

(a) Yes ☐
(b) No ☐

Q 13. Why haven't/ wouldn't you move to a town closer to the mine site?
(Please tick all relevant items)

(a) Lack of housing for rental ☐
(b) Lack of housing for purchase ☐
(c) Housing is too expensive ☐
(d) Lack of educational facilities for children/partner ☐
(e) Lack of job opportunities for partner ☐
(f) Family will not move ☐
(g)Lack of recreational/entertainment facilities ☐
(h) Lack of services provided ☐
(i) Other ☐
If "Other" please specify _____

Q 14: If you were offered a job in another mining town in the Bowen Basin region, where would you prefer to have your main place of residence?

(a) The same town I live now ☐
(b) Larger town like Mackay or Gladstone ☐
(c) Somewhere on the coast ☐
(d) A specific place (Please specify) _____
(e) Small town close to work place ☐
(f) Major centre close to work place ☐

If (e) or (f), What is the maximum amount of travelling time (one way) by car that you would consider? _____

Q 15: Given the choice, please select your preferred main residence?

(a) 2 Bedroom House, medium Block ☐

(b) 3+Bedroom House, large block ☐

(c) 1-2 Bedroom Unit ☐

(d) 3+Bedroom House or Unit ☐

(e) Shared House/Flat ☐

(f) Townhouse/Duplex ☐

(g) Other (please specify) _____

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*If you or your family can help us with a more detailed follow-up survey, please provide details here

Name   Telephone

Q 16: If you were offered a job in a different location next year, please rate the importance of the following issues on a scale of 0 to 4 where:

0 = not at all important, 1= slightly important, 2= fairly important, 3 = important, and **4 = very important.**

	Your Score
Increased salary	
Having regular work hours	
Having block work periods and then time off	
Not having shift work	
Not living in a work camp	
Able to live where there are social opportunities	
Able to get to work each day from the family home	
Not have to drive to and from work each day	
Able to live in a larger centre	
Able to live somewhere close to the coast	
Being somewhere that suited the family	
Working in a stimulating job	
Working in a supportive company environment	

Q 17: In your current situation, please rate how important the following issues are to you, using the same scale, **0 = not at all important**, through to **4 = very important.**

	Your score
Enjoying life's pleasures, having fun	
Having secure surroundings, neighbours you trust	
Helping the community and people around you	
Being successful, capable and ambitious	
Fair go for all people and caring for nature	

Q 18: What is your age?   _____years

Q 19: What is your gender?   Male ☐   Female ☐

Q 20: What is your family status?

(a) Single ☐
(b) Married or *de facto* partner ☐
(c) Divorced or separated ☐
(d) Widowed ☐
(e) Do you have children? Yes ☐ No ☐
(f) Children are living with you? Yes ☐ No ☐

Appendix Two: Summary tables of the Dawson Mine Survey

Q1. How long have you been working:

		Years working for the mining industry?	Years working for Anglo Coal?	Years contracting?	Years in the BB area?	Years at this site?
		307	220	165	213	280
Mean		9.669	3.417	3.235	8.495	5.829
Median		5.000	2.000	2.000	4.000	2.000

Q2. What location or town were you working at before you took this position with Anglo?

	South East Qld	North Qld	Central Qld	North West Qld	Bowen Basin	Interstate	Overseas
Frequency	32	5	53	5	145	30	10
Percent	9.9%	1.6%	16.5%	1.6%	45.0%	9.3%	3.1%

Q3. How much longer do you think you will work in the industry?

	Less than a year	One to two years	Three to five years	More than five years
Frequency	8	14	48	251
Percent	2.5%	4.3%	14.9%	78.0%

Q4. How much longer do you think you will work in this area around the Dawson mine?

	Less than a year	One to two years	Three to five years	More than five years
Frequency	20	42	66	190
Percent	6.2%	13.0%	20.5%	59.0%

Q5. What is your main town of residence?

	Frequency	Percent
Moura	150	46.6%
Biloela	48	14.9%
Banana	3	.9%
Theodore	12	3.7%
Baralaba	2	.6%
Gladstone	9	2.8%
Calliope	4	1.2%
Rockhampton	26	8.1%
Yeppoon	7	2.2%
Thangool	6	1.9%
Brisbane	6	1.9%
Gracemere	5	1.6%
Other	43	13.4%

Q6. How long have you lived in this town (Q5)?

	<1yr	1 – 2yrs	3 – 5yrs	6+yrs	Total
Frequency	39	82	32	150	303

Percent	12.1%	25.5%	9.9%	46.6%	94.1%

Q7. In this town (Q5) ?

	Did buy your house	Are you renting house/unit	Do you share house/unit	Do you renting cabin/caravan park	Do you live in work camp	Other
Frequency	162	97	24	5	29	4
Percent	50.3%	30.1%	7.5%	1.6%	9.0%	1.2%

Q8. What are the main reasons why you choose to live in this town?

	N	Percent
Mine co. provided low cost housing	76	12.7%
Housing was affordable	50	8.4%
Housing was available	46	7.7%
Don't like commuting	52	8.7%
Don't want to be away from family	93	15.6%
Gotten used to mining towns	15	2.5%
Family like the lifestyle	75	12.6%
Town is big enough	61	10.2%
Town is close enough	82	13.7%
Worthwhile in short run	47	7.9%

Q9. How long do you expect that you (and your family) will continue to live in this town?

Years	Frequency	Percent
<= 2	59	18.3%
3 - 5	85	26.4%
6 - 10	60	18.6%
11+	46	14.3%

Q10. How likely is it that you (and your family) would move to a similar town in the future if you got offered a job in another location?

	Unlikely	1 – 30%	31 – 60%	61 – 90%	Very likely
Frequency	65	46	83	51	77
Percent	20.2%	14.3%	25.8%	15.8%	23.9%

Q11a. While at work in your current situation: Where do you live?

	Work camp	Shared house close to work	Own house close to work	Flat or unit close to work	Cabin/caravan park close to work
Frequency	83	36	157	17	7
Percent	25.8%	11.2%	48.8%	5.3%	2.2%

Q11B. While at work in your current situation: Would prefer to live?

	Work camp	Shared house close to work	Own house close to work	Flat or unit close to work	Cabin/caravan park close to work
Frequency	26	15	141	21	2
Percent	8.1%	4.7%	43.8%	6.5%	.6%

Q12. Would you like to move your main place of residence (where you live when not working) to a town closer to the mine site?

	Yes	No
Frequency	95	201
Percent	29.5%	62.4%

Q13. Why haven't/wouldn't you move to a town closer to the mine site?

		N	Percent
Not move to town closer to mine	Lack of housing for rental	55	8.5%
	Lack of housing for purchase	42	6.5%
	Housing is too expensive	143	22.1%
	Lack of education facility child/partner	56	8.6%
	Lack of job opportunities	61	9.4%
	Family will not move	67	10.3%
	Lack of recreational facilities	98	15.1%
	Lack of services	85	13.1%
	Don't want to move	12	1.9%
	Already live in nearest town	25	3.9%
	Other	4	.6%

Q14. If you were offered a job in another mining town in the Bowen Basin region, where would you prefer to have your main place of residence?

		Same town	Larger town	Somewhere on coast	Specific place	Small town close to work	Large town close to work
Responses	N	103	51	67	14	78	39
	Percent	29.3%	14.5%	19.0%	4.0%	22.2%	11.1%

Q14g. If Small town / large town close to work has been selected:
What is the maximum amount of travelling time by car, one way to your workplace you find acceptable?

	Small town close to work		Large town close to work	
	Small Town		Large Town	
	Mean	Median	Mean	Median
max travel time if living in town close by	.75	.50	.98	.75

Q15. Given the choice, please select your preferred main residence?

	2 BR House, Med block	3+ BR House, Large Block	1-2 BR Unit	3+ BR House or Unit	Shared House or Flat	Townhouse / Duplex	Farm	Other

Frequency	18	206	8	42	2	12	11	3
Percent	5.6%	64.0%	2.5%	13.0%	.6%	3.7%	3.4%	.9%

Q16. If you were offered a job in a different location next year, please rate the importance of the following issues on a scale of 0 to 4, whereby 0 means 'not at all important' and 4 means 'very important'.

Increased salary

		Frequency	Percent
Not at all important	0	4	1.2
Slightly important	1	23	7.1
Fairly important	2	26	8.1
Important	3	52	16.1
Very important	4	187	58.1

Regular hours

		Frequency	Percent
Not at all important	0	7	2.2
Slightly important	1	15	4.7
Fairly important	2	40	12.4
Important	3	70	21.7
Very important	4	151	46.9

Block + time off

		Frequency	Percent
Not at all important	0	21	6.5
Slightly important	1	20	6.2
Fairly important	2	30	9.3
Important	3	73	22.7
Very important	4	143	44.4

No shift work

		Frequency	Percent
Not at all important	0	77	23.9
Slightly important	1	56	17.4
Fairly important	2	47	14.6
Important	3	38	11.8
Very important	4	60	18.6

Not live in work camp

		Frequency	Percent
Not at all important	0	41	12.7
Slightly important	1	37	11.5
Fairly important	2	43	13.4
Important	3	41	12.7
Very important	4	115	35.7

Social opportunities

		Frequency	Percent
Not at all important	0	15	4.7
Slightly important	1	25	7.8
Fairly important	2	75	23.3
Important	3	75	23.3
Very important	4	87	27.0

Get home each day

		Frequency	Percent
Not at all important	0	13	4.0
Slightly important	1	24	7.5
Fairly important	2	34	10.6
Important	3	60	18.6
Very important	4	159	49.4

Not drive each day

		Frequency	Percent
Not at all important	0	44	13.7
Slightly important	1	52	16.1
Fairly important	2	65	20.2
Important	3	57	17.7
Very important	4	62	19.3

Larger centre

		Frequency	Percent
Not at all important	0	53	16.5
Slightly important	1	60	18.6
Fairly important	2	74	23.0
Important	3	55	17.1
Very important	4	36	11.2

Close to coast

		Frequency	Percent
Not at all important	0	58	18.0
Slightly important	1	49	15.2
Fairly important	2	58	18.0
Important	3	52	16.1
Very important	4	60	18.6

Suit family

		Frequency	Percent
Not at all important	0	8	2.5
Slightly important	1	10	3.1

Fairly important	2	25	7.8
Important	3	63	19.6
Very important	4	175	54.3

Stimulating job

		Frequency	Percent
Not at all important	0	7	2.2
Slightly important	1	7	2.2
Fairly important	2	31	9.6
Important	3	80	24.8
Very important	4	157	48.8

Supportive company

		Frequency	Percent
Not at all important	0	5	1.6
Slightly important	1	7	2.2
Fairly important	2	31	9.6
Important	3	77	23.9
Very important	4	163	50.6

Q17. In your current situation, please rate the following using the same scale as in Q16.
　　　See appendix two for more details.

Q18. What is your age?

	<= 18	19 - 25	26 - 30	31 - 35	36 - 40	41 - 45	46 - 50	51 - 55	56-60	60+
Frequency	4	48	51	52	45	41	35	19	13	6
Percent	1.2%	14.9%	15.8%	16.1%	14.0%	12.7%	10.9%	5.9%	4.0%	1.9%

Q19. What is your gender?

	Male	Female
Frequency	250	64
Percent	77.6%	19.9%

Q20. What is your family status?

	Single	Married or de facto	Divorced or separated	Widowed
Frequency	67	222	17	4
Percent	20.8%	68.9%	5.3%	1.2%

Q21. Do you have Children?

	Children	No children
Frequency	181	76
Percent	56.2%	23.6%

Q22. Those that have children: Are they living with you?

	Living with children	Not living with children
Frequency	114	57
Percent	35.4%	17.7%

# Appendix Three: Cluster and Regression Tables

Two Step Cluster

Auto-Clustering

Number of Clusters	Schwarz's Bayesian Criterion (BIC)	BIC Change(a)	Ratio of BIC Changes(b)	Ratio of Distance Measures(c)
1	1444.639			
2	1129.361	-315.278	1.000	1.431
3	924.333	-205.029	.650	2.004
4	847.579	-76.753	.243	1.693
5	823.120	-24.459	.078	1.190
6	810.688	-12.433	.039	1.117
7	804.898	-5.790	.018	1.077
8	803.174	-1.724	.005	1.598
9	821.187	18.013	-.057	1.020
10	839.848	18.661	-.059	1.223
11	864.401	24.553	-.078	1.021
12	889.507	25.106	-.080	1.000
13	914.615	25.108	-.080	1.170
14	943.491	28.876	-.092	1.040
15	973.220	29.729	-.094	1.163

a The changes are from the previous number of clusters in the table.

b The ratios of changes are relative to the change for the two cluster solution.

c The ratios of distance measures are based on the current number of clusters against the previous number of clusters.

Generalized Euclidean metric individual differences model
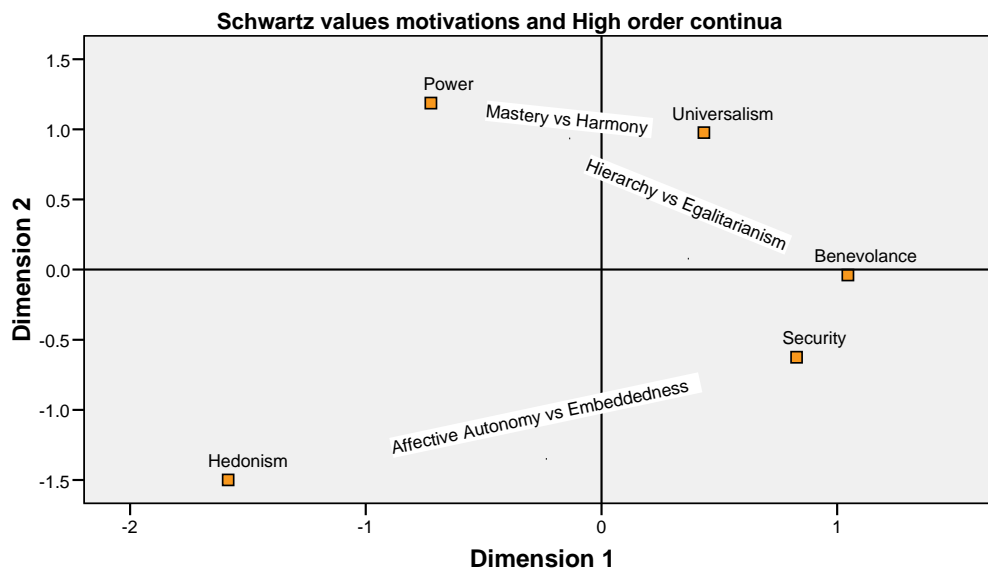
Perceptual map of Schwartz values as source of segmentation variables, generalised across all segments – ALSCAL Multidimensional scaling, for provision of a continuous variable to combine with demographic categorical data, using two step clustering, via maximum likelihood and Bayes information criterion for optimum cluster selection.

Cluster Profiles

Centroids

		Affestive Autonomy vs Embeddedness		Mastery vs Harmony	
		Mean	Std. Deviation	Mean	Std. Deviation
Cluster	1	.0754	1.47077	.1164	.70720
	2	.2134	1.60453	-.1372	.70857
	3	-.0987	1.21047	-.0084	.59959
	Combined	.0158	1.37703	.0020	.65906

				Segments		
				Focused female staffers	Empowered Single young guys	Married good-time guys
				Count	Count	Count
Employee Type	Miners			29	59	146
	Staff			56	0	0
Gender	Male			24	59	146
	Female			61	0	0
Family status	Single			19	47	0
	Married or de facto			58	0	146
	Divorced or separated			6	10	0
	Widowed			2	2	0
Children?	Children	Living with you?	Living with children	23	5	83
			Not living with children	10	10	29
	No children	Living with you?	Living with children	0	0	1
			Not living with children	26	23	16

Factor analysis of future work issues

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.764
Bartlett's Test of Sphericity	Approx. Chi-Square	785.697
	df	78
	Sig.	.000

Rotated Factor Matrix(a)

	Factor			
	1	2	3	4
Increased salary				
Regular hours				.804
Block + time off				.396
No shift work		.423		

Not live in work camp		.793	
Social opportunities		.443	
Get home each day		.570	
Not drive each day	.509		
Larger centre	.856		
Close to coast	.623		
Suit family			.467
Stimulating job			.695
Supportive company			.626

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 5 iterations.

Regression of latent variables
Model Summary - Hierarchical + backwards deletion

Segments(a)	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
		R Square Change	F Change	df1	df2
Focused female staffers	Factor1	.411	.169	.131	1.10323
	Factor2	.611	.373	.302	.98880
	Factor3	.750	.563	.489	.84619
	Factor4	.754	.568	.468	.86345
Empowered Single guys	Factor1	.273	.075	.019	1.15430
	Factor2	.403	.162	.035	1.14517
	Factor3	.564	.319	.160	1.06818
	Factor4	.633	.400	.205	1.03898
Married good-time guys	Factor1	.201	.041	.018	1.18739
	Factor2	.218	.047	-.007	1.20220
	Factor3	.522	.273	.212	1.06348
	Factor4	.530	.281	.201	1.07118

a. Dependent Variable: preferred location of main residence