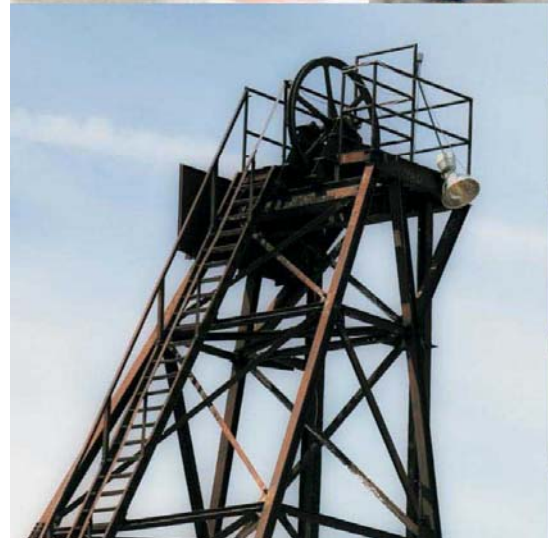
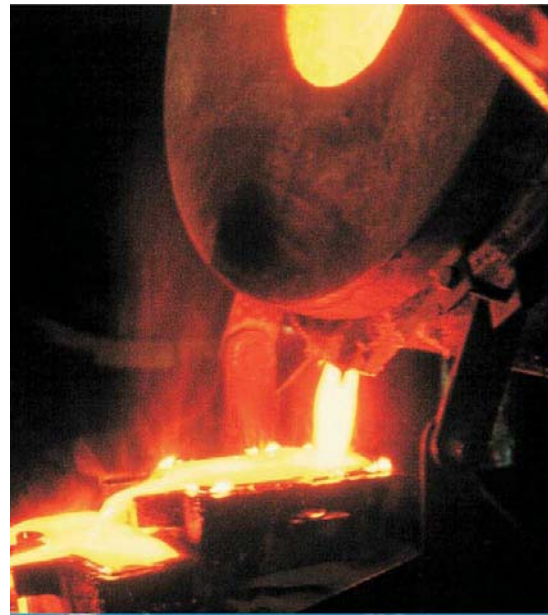




MINING QUALIFICATIONS AUTHORITY

**A GUIDE FOR IDENTIFYING AND
ADDRESSING SCARCE AND CRITICAL
SKILLS IN THE MINING AND MINERALS
SECTOR
2008-2010**

REVISED FEBRUARY 2009



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Summary

Overview of the Guide

The Mining Qualifications Authority is publishing this Guide to assist and support the development and implementation of mechanisms and strategies to identify and address scarce and critical skills in the Mining and Minerals Sector (MMS). The intention is to ensure that the sector has access to the necessary tools and information to support skills development critical to maintaining and growing its skills base, thereby sustaining productive and support operations.

The Guide begins by locating the explanation for the sector focus on scarce and critical skills within the context of the national programme for skills development and the acquisition of skills in economic growth priority areas as well as imperatives within the MMS about ownership and employment equity, social and labour planning and health and safety.

Common understanding of Scarce and Critical Skills

Six terms are defined in this section to assist the MMS with identifying and categorizing skills shortages against occupations within the sector. These are:

- Scarce skills – Department of Labour skills development usage
- Critical skills – Department of Labour skills development usage
- Priority skills – ASGI-SA (JIPSA) usage as well as application by MQA for MMS sector
- Core skills – MMS sector usage
- Support skills – Department of Labour employment equity usage
- Portable skills – Drawn from South African Qualifications Authority (SAQA) usage

Current Picture of MMS Scarce and Critical Skills

Indicators of severity of the skills shortage and conditions resulting in such shortages together with examples from sector skills reports – Workplace Skills Plans (WSPs), Annual Training Reports (ATRs) and MQA Sector Skills Plans (SSPs) – are reflected in the table below.

Term	Definition	Indicators & drivers	Examples in MMS
Scarce skills	Occupation in which there is a scarcity of qualified and experienced people – now or in the future. Categorised as	Please note: The key to identifying scarcity at this level is the requirement for a qualification and experience	
	(a) Absolute – qualified and experienced people are not available in the labour market	<ul style="list-style-type: none"> • Hard-to-fill vacancies • High replacement demand • Low unemployment • Regulatory registration requirements 	<ul style="list-style-type: none"> • Engineers – all kinds • Technicians – engineering • Artisans and trades workers - engineering • Diamond sorters • Diamond polishers
	(b) Relative – qualified and experienced people available but do not meet other employment criteria	<ul style="list-style-type: none"> • Geographical location • Industry attractiveness • Employment equity • Education and training pipeline delays 	<ul style="list-style-type: none"> • Production and Operation Managers including Mine Overseers
Core skills	Occupations which are core to production and operations or jewellery manufacturing	Essential to the business and without which the organization cannot perform	<ul style="list-style-type: none"> • Engineering – professional, technical and trade • Jewellery manufacturing
Support skills	Occupations in the MMS which are required to assist and service operational, production and manufacturing activities		<ul style="list-style-type: none"> • Financial management • Human resources management • Hostel management

Or (indicated by a bracket between the two sub-definitions of Scarce skills)

Plus (indicated by a bracket between Scarce skills and Core skills)

Equals (indicated by a bracket between Core skills and Support skills)

Term	Definition	Indicators & drivers	Examples in MMS
Priority skills	Occupations which are essential to economic growth	Scarcity is constraining economic growth	
For the purposes of the MMS – skill scarcity in core skill occupations is taken as a strategic indicator for MMS priority skills			
Critical skills	Specific key or generic and “top-up” skills within an occupation, i.e. people in occupations who have gaps in their skills profile which limit their occupational performance	Please note the key for identifying a critical skills gap against an occupation is that the gap can be addressed through a skills programme type intervention	
	(a) Key or generic skills are those skills which enhance performance and which apply to all occupations These “in-occupation” skills are also used by SAQA to identify portable or transferable skills, referred to as “critical cross field outcomes”	<ul style="list-style-type: none"> • New job / occupational requirements • New forms of work organization • Educational legacy 	<ul style="list-style-type: none"> • Language and communication skills • Mathematical skills • Foundational science skills • ICT skills • Work organization skills • Literacy • Numeracy • Working in teams
	(b) Technical “top-up” skills	<ul style="list-style-type: none"> • New job / occupational requirements • New technology requirements • Specific mining occupation registration requirements 	<ul style="list-style-type: none"> • Health and Safety • New legislation • DME Certificate of Competency associated with engineering related work (this may be in addition to a trade or professional engineering related registration)

For the purposes of this Guide and strategic skills development support from the MQA, **portable** skills have been linked to key, generic skills associated with occupations as reflected in the section on critical skills above.

MQA Support Strategy

The MQA and the MMS have been participating in a number of initiatives to address scarce and critical skills and the MQA has a number of strategic skills development projects in place, including bursaries, learnerships, apprenticeships, ABET programmes, qualifications development and quality assurance of assessment and training provision to support skills development especially in scarce and critical skill areas. These strategies are listed in Appendix 2 at the end of this Guide and are reflected in the summary table above MMS focus on scarce and critical skills.

The Mining and Minerals Sector acknowledges that the vision¹ of “a globally competitive mining industry that draws on the human and financial resources of all South Africa’s people and offers real benefits to all South Africans” cannot be realised without addressing the “scarcity of relevant skills” which act as one of the “barriers to entry into the mining sector by historically disadvantaged South Africans (HSDAs)”. In order to address the scarcity of relevant skills, the industry has a legislated requirement for mining and production rights applicants to “develop and implement comprehensive Human Resources Development Programmes” as part of the Social and Labour Plan they are required to submit and adhere to. The Human Resources Development Programme consists of 5 plans including a skills development plan that must specify “hard-to-fill vacancies” – a key scarce skill indicator.

In addition to the increasing focus on scarce and critical skills for mining and production activities, the Department of Minerals and Energy has acknowledged² that it has responded to having to compete for scarce skills with the private sector in both Minerals and Energy by developing a departmental Scarce Skills Recruitment and Retention Strategy.

MQA focus on scarce and critical skills

As the sector’s skills development intermediary, the MQA has two key responsibilities in respect of identifying and reporting scarce and critical skills across the sector. The first is to provide a reliable set of skill shortage signals to the sector. The second is to direct strategic interventions and activities to address these shortages.

In respect of the second, the MQA has a set of support strategies in place to support the development of skills against the identified MMS Scarce and Critical Skills which include:

- Development and registration of Unit Standards and Qualifications;
- Development and registration of Learnerships and Skills Programmes for the registered qualifications and unit standards;
- Development and availability of Learning Materials;

¹ Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry, 2002

² Strategic Plan 2006/07-2010/11, Department Minerals and Energy

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- Training and registration of assessors and moderators able to assess and grant credit to learners against the registered unit standards and qualifications,
- Accreditation of training providers;
- Information management system and database to issue certificates of achievement to successful learners;
- Incentivising delivery of and participation in learnerships and Adult Basic Education and Training (ABET) through discretionary grants; and
- Supporting targeted programmes including bursaries, graduate development programmes, etc.

Purpose of the Guide

The Mining Qualifications Authority is publishing this Guide to assist and support the Mining and Minerals Sector's endeavours to ensure that it has the necessary mechanisms and strategies in place to reliably identify, measure and address scarce and critical skills in order to maintain and grow its skills base and sustain its productive and support operations.

The intention of the Guide is to assist skills planning processes at enterprise and sector levels by:

1. Deepening understanding and ways of identifying scarce and critical skills within the current skills development needs analytical processes;
2. Enhancing consistent application of the scarce and critical skills indicators and identification of root causes of scarce skills;
3. Enhancing ways of addressing scarce and critical skills; and
4. Applying the above in the completion of the Workplace Skills Plan (WSP).

The Guide is aimed at Skills Development Facilitators and Skills or Training Planning Managers at enterprise and sector levels and should facilitate both the identification of scarce and critical skills for intervention strategy planning to meet the variety of planning and reporting requirements embedded in WSP/ATR (MQA and DoL) as well as the Social and Labour Plan (Industry, DME) requirements.

The Guide builds on the skills planning research and analytical experiences of the MQA and its members over the period of the current National Skills Development Strategy, i.e. since March 2005. The intention is for the Guide to be reviewed on an annual basis to incorporate best practices in scarce and critical skills identification and planning.

Using the Guide

The Guide is divided into three sections.

1. The first deals with the definitions of scarce, critical, priority and core skills using the Department of Labour's *Framework* as a basis and includes examples from the MMS to illustrate both the definitions and indicators of scarce and critical skills.
2. The second section presents a summary of scarce and critical skill trends in the MMS from 2005 to date together with a summary of skills development interventions across the sector that are being implemented to address scarce and critical skills.
3. The third section provides a brief overview of the Organising Framework of Occupations and how this can best be used in the skills planning process to identify emerging and ongoing scarcity of skills, using the indicators that have been identified to-date within the MMS.

1. Applying the terminology in the MMS

In the Department of Labour's stakeholder agreed *Framework*, **Scarce and Critical Skills** refers to an absolute or relative demand – current or future – for skilled; qualified and experienced people to fill particular roles/professions, occupations or specialisations in the labour market. A more detailed explanation of the Department of Labour's usage is provided in Appendix 1.

Definition		Indicators and Drivers
<p><u>SCARCE SKILLS</u></p> <p><i>Occupations</i> in which there is a scarcity of qualified and experienced people, currently or anticipated in the future, either (a) because such skilled people are not available or (b) they are available but do not meet employment criteria</p>	<p>Absolute scarcity: suitably skilled (qualified and experienced) people are not available</p>	New or emerging occupation
		Hard-to-fill vacancies <ul style="list-style-type: none"> • 6-12 months
	<p>Relative scarcity: suitably skilled (qualified and experienced) people are available but do not meet other employment criteria</p>	Replacement demand <ul style="list-style-type: none"> • Age • Chronic ill-health
		Regulatory requirements <ul style="list-style-type: none"> • Statutory registration
		Geographical location
For the MMS: Scarce plus core is used to identify priority skills		
<p><u>CRITICAL SKILLS</u></p> <p>Specific key or generic and "top up" skills <u>within</u></p>	<p>Key or generic skills, including (in SAQA-NQF terminology) critical cross-field outcomes.</p>	Cognitive skills <ul style="list-style-type: none"> • Problem-solving • Learning to learn
		Language and communication skills

<u>an occupation</u>		Mathematical skills
		ICT skills
		Working in teams
	Particular occupationally specific "top-up" skills	Health and Safety
		New legislation / Other legislative requirements
		Specific Technical skills
		DME Certificates of Competency ³
For the MMS: Critical skills includes portable skills		

Both scarce and critical skills must be identified at the occupational level, with scarce skills being considered against the occupation itself and critical skills being reflected as specific skills within the occupation.

Setting priorities for addressing scarce and critical skills in the MMS

The definitions of core, support and priority skills – reflected in the table below – can be placed against the Department of Labour’s definitions to enable the MMS and MQA to identify scarce and critical skills which are priorities for the sector and which require a sector-wide strategic intervention.

	Definition	Explanation
Core skills (MMS)	Occupations which are core to production and operations or jewellery manufacturing	Essential to the business and without which the organisation cannot perform
Support skills (MMS)	Occupations in the MMS which are required to assist and service operational, production and manufacturing activities	Examples include corporate services, human resources, labour relations
Priority skills (JIPSA)	Occupations which are essential to economic growth	Scarcity is constraining economic growth

Having identified scarce and critical skills in the MMS, priorities would be set by determining whether the scarce or critical skill falls within those skills identified as core to the sector as reflected in the quadrant analysis below:

³ Please note that this applies to additional occupational registration requirements. For example, the trade test would be a Department of Labour Government certificate of competency but working in fiery mines may require an additional certificate of competency. Registration with the Engineering Council of South Africa would be professional engineer status but working in Hard Rock engineering may require an additional certificate of competency issued by the DME. This would be regarded as a skills programme rather than a whole (including unit standards based) qualification against the occupation.

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	Scarce	Critical
Core	PRIORITY skills interventions for the full occupational competence required (MQA strategy for MMS)	PRIORITY skills interventions for parts of the occupational competence required (MQA strategy for MMS)
Support	Individual company interventions	Individual company interventions

2. The current picture of MMS scarce and critical skills

In respect of scarce skills within the MMS, WSPs and SSP research in the current NSDS period (NSDS II) have reflected constant scarcity in particular occupations. A summary of these scarce skills by occupational category is presented below together with the drivers identified to date for this scarcity and some of the strategies that are being developed or implemented to address the scarcity⁴: Scarce skills that are identified as core skills have been highlighted in bold. Where applicable, an asterisk has been placed next to scarce skills which have also been identified as priority skills in the Joint Initiative on Priority Skills Acquisition (JIPSA).

Occupational Category	Indicators and Drivers	Development Strategies
<p>Managers – particularly</p> <ul style="list-style-type: none"> • Production and Operation Managers, including Mine Overseers; • Environmental managers, • Finance Managers, • Technical Project Managers • Owner Managers 	<ul style="list-style-type: none"> • Long-term vacancies • Low unemployment • Replacement demand (retirement) • Equity considerations – HDSAs with the requisite skills combinations • Geographical location⁵ 	<ul style="list-style-type: none"> • Tertiary education • Management development courses • Special executive training programmes • <i>Career progression (path) planning</i> • <i>Mentorship planning</i> • <i>Internship planning</i>
<p>Professionals – particularly</p> <ul style="list-style-type: none"> • Engineers* – Electrical, Mechanical, Mining and Chemical, Civil • Geologists, • Metallurgists, • Surveyors, • Accountants 	<ul style="list-style-type: none"> • Long-term vacancies • Low unemployment • Equity considerations • Movement out of sector • Geographical location • Total number of graduates in these disciplines insufficient to meet demand, especially economic growth demand in the MMS and other sectors of the economy 	<ul style="list-style-type: none"> • Bursaries and bursary support for existing employees and new labour market entrants to obtain qualifications • Initiatives to improve maths and science at school levels, e.g. support or adopt schools • <i>Career progression (path) planning</i> • <i>Mentorship planning</i> • <i>Internship planning</i>

⁴ Strategies in italics are those identified in broader MMS and DME documents

<p>Technicians and Trades Workers⁶ - particularly</p> <ul style="list-style-type: none"> • Engineering technicians* • Instrument technicians* • Mine Surveyors • Draughtspersons 	<ul style="list-style-type: none"> • Long-term vacancies • Low unemployment • Equity considerations • Movement out of the sector • Total number of graduates in technician disciplines insufficient to meet demand, especially economic growth demand in the MMS and other sectors of the economy 	<ul style="list-style-type: none"> • Bursaries and bursary support for existing employees and new labour market entrants to obtain qualifications • Initiatives to improve maths and science at school levels, e.g. support or adopt schools • <i>Career progression (path) planning</i> • <i>Mentorship planning</i> • <i>Internship planning</i>
<p>Technicians and Trades Workers – particularly artisans</p> <ul style="list-style-type: none"> • Electricians* • Instrument mechanics* • Fitters and Turners* • Plater-Boilermaker* • Riggers • Millwrights* • Diesel motor mechanics* • Plater-Welder* • Team Leader / Mining Supervisor • Diamond Sorters • Diamond / Stone polishers 	<ul style="list-style-type: none"> • Long-term vacancies in some occupations • <i>Movement out of the sector</i> • <i>JIPSA and Department of Labour identified artisans especially in engineering fields as an absolute scarcity with replacement demand and insufficient numbers to meet economic growth demand in the MMS and other sectors as drivers, i.e. engineering related artisans categorised as priority scarce skills</i> 	<ul style="list-style-type: none"> • Qualifications review and improvement – MQA Standards Generating Body (MQA SGB) • Learnership review and improvement • Enhancements to the apprenticeship system • Review and improvement of trade testing system (MQA driving review) • FET College curriculum improvements • Establishment and support of ISOEs • Additional grant funding and NSF Scarce and Critical Skills funding window for artisan development • JIPSA and Business Leadership artisan development support

⁵ Geographical location was highlighted in the MQA's 5 Year SSP

<p>Machinery Operators and Drivers – particularly</p> <ul style="list-style-type: none"> • Miners • Drillers • Crane / Hoist / Lift Operators • Truck Drivers • Machine Operators 	<ul style="list-style-type: none"> • High replacement demand • Additional skilling required in specific technical skills <ul style="list-style-type: none"> ▪ Rock breaking, blasting ▪ Health & safety ▪ Manufacturing ▪ Production ▪ Machine maintenance ▪ Health and safety • Additional skilling required in generic skills <ul style="list-style-type: none"> ▪ Communication ▪ ABET 	<ul style="list-style-type: none"> • Large numbers of unemployed experienced workers available requiring <ul style="list-style-type: none"> ▪ Mining contextual skills ▪ Learnerships ▪ Skills programmes ▪ In-service training ▪ ABET programmes ▪ RPL • <i>Career progression (path) planning</i>
<p>Elementary workers – particularly</p> <ul style="list-style-type: none"> • Mining Support workers • Construction riggers 	<ul style="list-style-type: none"> • High replacement demand • Additional skilling required in specific technical skills 	<ul style="list-style-type: none"> • Large numbers of unemployed experienced workers available requiring <ul style="list-style-type: none"> ▪ Mining contextual skills ▪ Skills programmes ▪ In-service training ▪ ABET programmes ▪ RPL • <i>Career progression (path) planning</i>

The last two occupational categories highlight the use and application of **critical and portable skills** in the MMS.

A final consideration for scarce and critical skills in the MMS sector is the strategic possibilities contained within the *Social and Labour Plan Guidelines*, particularly the Skills Development Programme and the *Career progression (path) Plan*. This would require the MMS to identify occupational pathways and possibilities for skilling people to meet scarce

⁶ It must be noted that the Department of Labour has revised and restructured the SASCO occupational categories into an Organising Framework for Occupations which is now a compulsory format for SETAs to use in the SSP and is being phased in for application in WSPs and ATRs. The OFO format has been used in this Guide to ensure its use as a sustainable Guide for the MMS.

skills in the pathway. Essentially this would enable the MMS to shift some occupations from the scarce skill category to a critical skill category and make more extensive use of skills development interventions such as skills programmes, particularly in those occupations which are core to the MMS.

3. Tools for identifying scarce and critical skills

The Organising Framework for Occupations (OFO)

Essentially the Organising Framework for Occupations is a skills based, coded classification system which builds on the South African Standard Classification of Occupations (SASCO) familiar to the sector through its use by Stats-SA and the DoL's employment equity reporting format. The OFO represents a significant enhancement on SASCO for skills development planning and implementation purposes in that it:

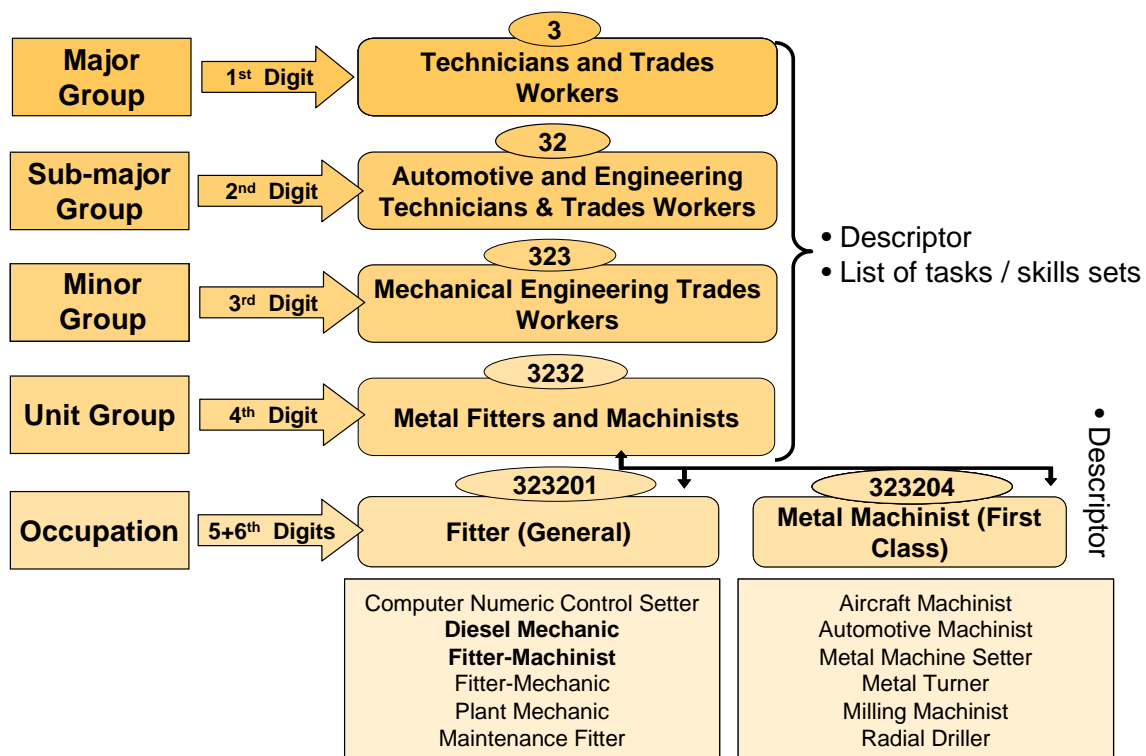
- Captures all jobs in the form of occupations (Similar to SASCO); and
- Groups occupations into successively broader categories and hierarchical levels based on
 - Skill level and
 - Skill specialisation

For the purposes of the OFO and skills development planning systems in South Africa,

- An **occupation** is defined as a set of jobs that require the performance of similar or identical sets of tasks across a range of contexts;
- **Skill level** is determined by the:
 - Level or amount of formal education and training required for that occupation;
 - Amount of previous experience in a related occupation; and
 - Amount of on-the-job training required to competently perform the set of tasks required for that occupation.
- **Skill specialisation** is defined in terms of the:
 - Range and complexity of the tasks associated with that occupation;
 - Field of knowledge required;
 - Tools or equipment used;
 - Materials worked on or information worked with; and
 - Goods produced or services provided

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The OFO was constructed through a process of listing all jobs and then grouping these together based on the skill specialization and skill level associated with similar jobs. For example, Diesel Mechanic, Fitter-Machinist, Plant Mechanic and Maintenance Fitter share similar tasks, skill level and skill specialization requirements to be grouped together as *General Fitter* while Automotive Machinist, Metal Machine Setter, Metal Turner and Milling Machinist can be grouped together as *Metal Machinist*. At the next hierarchical level *General Fitters* and *Metal Machinists* can be grouped together as *Metal casting, Forging and Finishing Trades Workers*. *Structural Steel and Welding Trades Workers* (which includes Boilermakers and Welders, Plater-Boilermakers and Plater-Welders) are sufficiently similar to *Metal Casting, Forging and Finishing Trades Workers* to be grouped together as **Fabrication Engineering Trades Workers**. Similarly these can be grouped together at this occupational level with Automotive Electricians and Mechanics, Mechanical Engineering Trades Workers, Manufacturing Trades Workers and Panel beaters, and Vehicle Body Builders, Trimmers as *Automotive and Engineering Trades Workers* and so on until the highest level grouping Technicians and Trades Workers. This is illustrated below.



For each occupation and at occupation group level there is a broad description of the occupation as well as a list of tasks and skills sets that are commonly associated with that occupation or group.

The OFO has enabled the development of a common language and coding, providing an additional mechanism for sectors to utilize in measuring the extent of skills shortages and anticipating intensity of that shortage. This is of particular value in a situation where

employers tend to focus on their immediate skills requirements for business, production and operational requirements and focus on their skills needs against occupational performance requirements and easily identifiable replacement demand (e.g. people close to retirement), mostly on an annual basis.

4. MQA support strategy for Scarce and Critical Skills

The MQA and the MMS have been participating in a number of initiatives to address scarce and critical skills and the MQA has a number of strategic skills development projects in place, including bursaries, learnerships, apprenticeships, ABET programmes, qualifications development and quality assurance of assessment and training provision to support skills development especially in scarce and critical skill areas.

The MQA support strategy will be amended to meet changing demand in the MMS through annual research and monitoring of scarce and critical skills and strategic skills development interventions.

APPENDIX 1: DETAILED EXPLANATION OF SCARCE AND CRITICAL SKILLS

Scarce skills

Refers to those *occupations* in which there is a scarcity of qualified and experienced people, currently or anticipated in the future, either (a) because such skilled people are not available or (b) they are available but do not meet employment criteria. This scarcity can arise from one or a combination of the following, grouped as relative or absolute:

Absolute scarcity: suitably skilled (qualified and experienced) people are not available. This lack of availability can be linked to the following indicators:

- A new or emerging occupation, i.e. there are few, if any, people in the country with the requisite skills (qualification and experience) and education and training providers have yet to develop learning programmes to meet the skills requirements.

In the MMS this has not yet been reflected in WSPs or in SSP or scarce and critical skills research to date. Examples from other sectors relate to emerging industries such as Information and Communication Technology where new occupations requiring new skills sets and qualifications such as Web Designer or Systems Network Engineer have emerged over the last 10 years. The imperatives for mineral and metal beneficiation and the need to grow the jewellery manufacturing sector may be experiencing scarcity in some occupational categories – particularly linked to a lack of available training provision and a lack of awareness amongst pre-labour market entrants as to opportunities in this sub-sector.

- Firms, sectors and even the country are unable to implement planned growth strategies and experience productivity, service delivery and quality problems directly attributable to a lack of skilled people. This is generally indicated by “hard-to-fill” vacancies.

In the MMS this is clearly reflected in WSPs and SSP research and the fact that the Social and Labour Plan Guidelines require applicants to specify “hard-to-fill” vacancies. Internationally, the measure for hard-to-fill vacancies is specified in working days with anything over 40 working days counted as hard-to-fill and an indicator of scarcity. The 12 months measure used in the Social and Labour Plan Guideline suggests that skills development strategies against hard-to-fill vacancies should drive the identification and development of skills to occupational competence from within the labour market.

In the latest MQA SSP the identification of “hard-to-fill” vacancies has been coupled with an unemployment indicator which serves as a useful check for this scarce skill indicator. Unemployment is a measure of how many people in the labour market are available to fill vacancies and take up employment regardless of the attractiveness of the industry or geographical location (see relative scarcity below). Occupational categories in which there is no surplus labour available, i.e. no or low

unemployment of people skilled for these occupations, is an indicator of potential shortage in the labour market, particularly if there is potential for high replacement demand, i.e. an aging skills pool for that occupation.

- Replacement demand would reflect an absolute scarcity where there are no people enrolled or engaged in the process of acquiring the skills that need to fill occupations where vacancies are occurring due to retirement or chronic ill-health .

Nationally industries and sectors closely linked to the MMS sector and having similar technical skills needs – metal engineering, energy, transport, petro-chemicals – have consistently indicated that a key driver of scarce skills in their respective industries is replacement demand due to an aging skilled workforce. The example most commonly highlighted being artisans and trades workers where claims are that 50% plus of people currently employed in these occupations are aged 54 and above.

- Specific occupational health and safety demand would reflect an absolute scarcity where new or changing requirements for people with specific qualifications and regulatory requirements. MQA research has indicated that the lack of appropriately qualified and experienced candidates is the major reason for difficulties in filling vacancies. The sector has to comply with strict health and safety regulations, which means that many operations can only be performed by personnel who are in possession of occupational or professional registration and specific qualifications, for example, government certificates of competency or professional body registration certificates. This limits the pool from which employers can recruit people and contributes to scarce skills.

Relative scarcity: suitably skilled (qualified and experienced) people are available but do not meet other employment criteria, for example:

- Geographical location, e.g. people are unwilling to work in particular areas and specifically chose to remain in urban areas.

In the MMS this is clearly reflected in WSPs and SSP research which has indicated that employers are experiencing “hard-to-fill” vacancies because the location is unattractive to skilled people in the labour market. Strategically this consideration is clearly linked to efforts to recruit and train people “in the shadow of the headgear”.

- Industry attractiveness considerations, i.e. suitably skilled people are unwilling to work in particular industries and the industry is unable to attract new labour market entrants.

The MMS has a low attractiveness employment and career profile in the South African context given the shrinkage of production activities and high retrenchment levels over the past 10 years, coupled with a high negative public profile concerning health and safety and a particular profile within apartheid history. Strategically this consideration is clearly linked to efforts to recruit and train people “in the shadow of the headgear” and calls for improved career guidance and explanations of career

and employment by the industry. This driver is also reflected in the DME's Scarce Skill Recruitment and Retention Strategy.

- Equity considerations, i.e. there are few if any candidates with the requisite skills (qualifications and experience) from specific groups available to meet the skills requirements of firms and enterprises.

In the MMS and nationally this has been a principal driver of scarce skills and the key barrier to reaching employment equity and BEE targets. Research over WSPs from 2000 to date conducted by the MQA indicated that between 2000 and 2005 skills shortages were strongly linked to the need to transform the racial and gender profile of intermediate and high level skill occupations in the sector (managerial, professional, technician and trades workers/artisans) and was specified by employers and stakeholders as the main driver behind scarce skills. Research over the period 2005 to 2007 indicates that the skills crisis has now reached levels where there is a growing absolute scarcity of skills with equity considerations being but one of a number of drivers for the lack of suitably skilled people in the South African labour market, linked both to increasing domestic demand for the same skills from a range of industries and economic sectors as well as an increasing demand from the international labour market.

- Replacement demand would reflect a relative scarcity if there are people in education and training (institutional and work-place) who are in the process of acquiring the necessary skills (qualification and experience) but where the lead time will mean that they are not available in the short term to meet scarce skill replacement demand.

In the MMS and nationally this is related to poor outcomes in the education pipeline with low pass rates from the schooling and FET systems; poor performance particularly in language, maths, science and technology subjects with longer higher and further education and training periods required (i.e. few people able to qualify in engineering disciplines at university within the 4 year period).

Exacerbating these lead times are workplace health and safety and professional practice requirements which require both skill and occupational or professional registration, see absolute scarcity above.

Critical Skills

In keeping with international trends refers to specific key or generic and "top up" skills within an occupation. In the South African context there are two groups of critical skills:

- Key⁷ or generic skills, including (in SAQA-NQF terminology) critical cross-field outcomes. These would include cognitive skills (problem solving, learning to learn), language and literacy skills, mathematical skills, ICT skills and working in teams.

⁷ This usage would be in keeping with the notion of critical or key skills in international usage

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In the MMS, this is related to literacy and communication skills shortages amongst people in work and amongst unemployed but experienced workers who the industry is able to recruit into less skilled occupations. Indications from scarce and critical skills research in other sectors highlights the need for skills planning staff to apply critical skills analysis at higher skilled occupational levels. For example, local suppliers to global and multi-national enterprises are experiencing critical skills shortages amongst financial managers and accountants who are required to prepare financial reports in a range of currencies.

- Particular occupationally specific “top-up” skills required for performance within that occupation to fill a “skills gap” that might have arisen as a result of changing technology or new forms of work organisation.

APPENDIX 2: MINING AND MINERALS SECTOR (MMS) SCARCE SKILLS LIST 2008

MQA Scarce Skills List 2008-2009		
Occupation Code	Occupation	Total Number required
	MANAGERS	393
111101	Chief Executive Officer / Managing Director	
131102	Sales and Marketing Manager	3
132201	Financial Manager	16
132301	Personnel/Human Resource Manager	4
132501	Research and Development Manager	9
133201	Engineering Manager	46
133202	Engineering Maintenance Manager	2
133503	Production/Operations Manager (Mining)	284
133504	Operations manager	18
133601	Supply and Distribution Manager	3
139902	Environmental manager	8
	PROFESSIONALS	1515
221101	Accountant (General)	42
221102	Management Accountant	18
221204	Internal Auditor	1
223101	Human Resource Advisor	21
223102	Recruitment Consultant/officer	2
223301	Training and Development Professional	41
224103	Statistician	2
224301	Economist	18
224502	Valuer	5
224701	Management Consultant	3
224703	Skills Development Facilitator	9
224902	Liaison Officer	1
225103	Market Practitioner	5
231101	Aeroplane Pilot	1
232202	Surveyor	137
232303	Jewellery Designer	7
233101	Chemical Engineer	50
233102	Chemical Engineering Technologist	11

Mining Qualifications Authority

233105	Metallurgical Engineer	31
233201	Civil Engineer	60
233202	Civil Engineering Technologist	4
233301	Electrical Engineer	152
233302	Electrical Engineering Technologist	18
233402	Electronics and Telecommunications Engineering Technologist	6
233501	Industrial Engineer	8
233502	Mechanical Engineer	177
233504	Industrial Engineering Technologist	2
233505	Mechanical Engineering Technologist	17
233601	Mining Engineer (excluding Petroleum)	197
233603	Mining Engineering technologist	40
234201	Chemist	34
234302	Environmental Consultant	7
234401	Geologist	245
234402	Geophysicist	14
234902	Metallurgist	63
251301	Environmental Health Officer	28
251302	Occupational Health and Safety Advisor	22
251901	Health Promotion Officer	11
261102	Systems Analyst	1
262103	Systems Administrator	2
263102	Network Administrator	2
	TECHNICIANS AND TRADES WORKERS	3319
311901	Earth and Atmospheric Science Technician	9
311903	Environmental Science Technician	5
312101	Architectural Draftsperson	8
312106	Surveying or Cartographic Technician	6
312201	Civil Engineering Draftsperson	28
312301	Electrical Engineering Technician	141
312302	Electrical Engineering Draftsperson	19
312501	Mechanical Engineering Draftsperson	54
312502	Mechanical Engineering Technician	79
312601	Safety Inspector	21
312901	Maintenance Planner	28
312903	Mining Technician	432
313103	Web Administrator	5
321202	Diesel Motor Mechanic	509

Mining Qualifications Authority

322201	Sheet Metal Trades Worker	52
322301	Metal Fabricator	30
322303	Welder	179
323201	Fitter (general)	380
323202	Fitter and Turner	185
323501	Millwright	381
331101	Bricklayer	1
331201	Carpenter and Joiner	1
334101	Plumber	12
341101	Electrician (General)	613
342101	Air-conditioning and Refrigeration Mechanic	1
342303	Electronic Equipment Trades Worker	12
399401	Jeweller	68
	COMMUNITY AND PERSONAL SERVICE WORKERS	60
411101	Ambulance Officer	3
411102	Intensive Care Ambulance Paramedic / Ambulance Paramedic	4
411401	Enrolled Nurse	1
441201	Emergency Service and Rescue Official	4
441202	Fire Fighter	32
442204	Private Investigator	1
442207	Security Officer	1
451201	Driving Instructors	14
	CLERICAL AND ADMINISTRATIVE WORKERS	74
511101	Contract Administrator	15
511201	Office Administrator	2
521101	Personal Assistant	1
531101	General Clerk	9
532101	Data Entry Operator	12
551101	Accounts Clerk	8
551102	Cost Clerk	11
551201	Bookkeeper	1
551301	Payroll clerk	4
591103	Purchasing Officer	11
	MACHINERY OPERATORS AND DRIVERS	2437
711104	Stone Processing Machine Operator	125
712101	Crane, Hoist or Lift Operator	69

Mining Qualifications Authority

712201	Driller	1029
712202	Miner	345
712203	Shot Firer	2
712901	Boiler or Engine Operator	14
712903	Cement Production Plant Operator	1
712910	Weighbridge Operator	3
721201	Earthmoving Plant Operator (General)	265
721203	Bulldozer Operator	61
721204	Excavator Operator	146
721206	Loader Operator	283
721909	Dredge Operator	6
731301	Train Driver	8
733101	Truck Driver (General)	80
	ELEMENTARY WORKERS	354
821103	Earthmoving Worker	50
821701	Construction Rigger	50
821902	Driller's Assistant	163
821904	Mining Support Worker	90
899301	Handyperson	1

APPENDIX 3: MQA SCARCE SKILLS LIST PER PROVINCE

The provincial distribution was obtained by assigning to each company that submitted a WSP for a Year 9 a province based on the province in which the largest percentage of its workers were located. The scarce skills reported by that company were then assigned to that province. The data provided in the sheets that follow are weighted data (i.e. extrapolated to the whole sector).

Eastern Cape

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
3	Technicians and Trade Workers (not specified)		18	18
133503	Production or Operations Manager		4	4
233603	Mining Engineering Technologist		3	3
251301	Environmental Health Officer		3	3
312502	Mechanical Engineering Technician		3	3
312601	Safety Inspector		17	17
321202	Diesel Motor Mechanic		25	25
322303	Welder or Welder		16	16
399401	Jeweller		6	6
711104	Stone Processing Machine Operator		13	13
712202	Miner		3	3
712910	Weighbridge Operator		3	3
721203	Bulldozer Operator		37	37
721204	Excavator Operator		57	57
721206	Loader Operator		76	76
721909	Dredge Operator	4		4
	Total	4	284	288

Free State

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
132201	Finance Manager		1	1
133201	Engineering Manager	2		2
133503	Production or Operations Manager		4	4
133504	Operations Manager		8	8
136304	Foreman		2	2
139902	Environmental Manager	1		1
232202	Surveyor		8	8
233201	Civil Engineer	9		9
233301	Electrical Engineer	2	8	10
233502	Mechanical Engineer	2	6	8
234401	Geologist	4	10	14
251301	Environmental Health Officer		1	1

Mining Qualifications Authority

311903	Environmental Science Technician	3		3
312301	Electrical Engineering Draftsperson		3	3
312302	Electrical Engineering Technician		3	3
312502	Mechanical Engineering Technician		4	4
312903	Mining Technician	4		4
321202	Diesel Motor Mechanic	8	10	18
322303	Welder or Welder		10	10
323201	Fitter	2	10	12
323202	Fitter and Turner	8	17	25
323501	Millwright	18		18
334101	Plumber		1	1
341101	Electrician	8	25	33
342101	Air-conditioning and Refrigeration Mechanic		1	1
411401	Enrolled Nurse		1	1
712201	Driller		119	119
712202	Miner		20	20
821701	Construction Rigger		1	1
	Total	72	273	345

Gauteng

Code	Occupation	scarcity	Relative scarcity	Total scarcity
1	Directors and Corporate Managers (not specified)		4	4
2	Professionals(not specified)	2		2
3	Technicians and Trade Workers(not specified)	42		42
111101	Chief Executive Officer or Managing Director	1	1	2
131102	Sales and Marketing Manager		3	3
132201	Finance Manager		6	6
133201	Engineering Manager	12	14	26
133202	Engineering Maintenance Manager	2		2
133503	Production or Operations Manager	3	26	29
133504	Operations Manager		1	1
133601	Supply and Distribution Manager		1	1
136304	Foreman		6	6
139902	Environmental Manager		3	3
139903	Laboratory Manager		2	2
141101	Café manager		1	1
221101	Accountant	5	16	21
221204	Internal Auditor	1		1
223101	Human Resource Advisor		8	8
223301	Training and Development Professional	9	1	10
224103	Statistician		1	1

Mining Qualifications Authority

224701	Management Consultant		1	1
224902	Liaison Officer		1	1
225103	Marketing Practitioner		5	5
232202	Surveyor	6		6
232303	Jewellery Designer	2		2
233101	Chemical Engineer		26	26
233102	Chemical Engineering Technologist		4	4
233105	Metallurgical Engineer	6	1	7
233201	Civil Engineer	12	18	30
233202	Civil Engineering Technologist	4		4
233301	Electrical Engineer	11	11	22
233302	Electrical Engineering Technologist	4		4
233402	Electronics and Telecommunications Engineering Technologist	5		5
233502	Mechanical Engineer	34	21	55
233504	Industrial Engineering Technologist		2	2
233505	Mechanical Engineering Technologist	2		2
233601	Mining Engineer	16	39	55
233603	Mining Engineering Technologist	5		5
234201	Chemist	5	24	29
234401	Geologist	20	65	85
234402	Geophysicist	2		2
234902	Metallurgist	7		7
249401	Technical Trainer	1		1
251302	Occupational Health and Safety Advisor	3	8	11
261102	Systems Analyst		1	1
262103	Systems Administrator		2	2
312201	Civil Engineering Draftsperson	9	14	23
312301	Electrical Engineering Draftsperson		9	9
312302	Electrical Engineering Technician	26	4	30
312501	Mechanical Engineering Draftsperson		21	21
312502	Mechanical Engineering Technician	30	4	34
312901	Maintenance Planner		5	5
312903	Mining Technician	18	52	70
313103	Web Administrator		1	1
321202	Diesel Motor Mechanic	36	39	75
322201	Sheet Metal Trades Worker		8	8
322301	Metal Fabricator	17		17
322303	Welder or Welder	1	1	2
323201	Fitter	6	46	52
323202	Fitter and Turner	7	4	11
323501	Millwright		46	46
334101	Plumber		11	11

Mining Qualifications Authority

341101	Electrician	17	58	75
342303	Electronic Equipment Trades Worker	12		12
399401	Jeweller		5	5
411102	Intensive Care Ambulance Paramedic or Ambulance Paramedic		4	4
441201	Emergency Service and Rescue Official		4	4
442207	Security Officer		1	1
511201	Office Administrator		1	1
521101	Personal Assistant		1	1
531101	General Clerk		9	9
551102	Cost Clerk		11	11
551301	Payroll Clerk		1	1
712201	Driller		34	34
712903	Cement Production Plant Operator		1	1
721203	Bulldozer Operator	5		5
721206	Loader Operator		21	21
731301	Train Driver	5		5
733101	Truck Driver	36	16	52
821904	Mining Support Worker		8	8
	Total	451	766	1217

Mpumalanga

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
6	Sales Workers(not specified)		20	20
9	Apprentices and Section 18.1 Learners		120	120
132201	Finance Manager		5	5
132301	Personnel or Human Resource Manager		2	2
133201	Engineering Manager		4	4
133503	Production or Operations Manager	1	110	111
133504	Operations Manager		4	4
133601	Supply and Distribution Manager		2	2
136304	Foreman	31	5	36
139903	Laboratory Manager	2	2	4
221101	Accountant	1	7	8
221102	Management Accountant	1	3	4
223101	Human Resource Advisor		3	3
223102	Recruitment Consultant or Officer		2	2
223301	Training and Development Professional		20	20
232202	Surveyor	22	35	57
233101	Chemical Engineer	3		3

Mining Qualifications Authority

233105	Metallurgical Engineer	3	3	6
233201	Civil Engineer	8	2	10
233301	Electrical Engineer	42	10	52
233502	Mechanical Engineer	41	8	49
233601	Mining Engineer	31	34	65
233603	Mining Engineering Technologist	1	5	6
234201	Chemist		4	4
234401	Geologist	30	31	61
234902	Metallurgist	1	8	9
249401	Technical Trainer		10	10
251301	Environmental Health Officer		6	6
251302	Occupational Health and Safety Advisor		11	11
251901	Health Promotion Officer	11		11
311903	Environmental Science Technician	1		1
312106	Surveying or Cartographic Technician		1	1
312201	Civil Engineering Draftsperson		1	1
312302	Electrical Engineering Technician	9	13	22
312501	Mechanical Engineering Draftsperson	3	30	33
312502	Mechanical Engineering Technician		14	14
312601	Safety Inspector		2	2
312901	Maintenance Planner		6	6
312903	Mining Technician		91	91
313103	Web Administrator	2	2	4
321202	Diesel Motor Mechanic	53	97	150
322303	Welder or Welder	9	58	67
323201	Fitter	10	117	127
323202	Fitter and Turner	2	10	12
323501	Millwright	139	47	186
341101	Electrician	21	169	190
411101	Ambulance Officer		3	3
441202	Fire Fighter		32	32
451201	Driving Instructor		10	10
511101	Contract Administrator		15	15
551101	Accounts Clerk		5	5
551301	Payroll Clerk		3	3
711104	Stone Processing Machine Operator		68	68
712101	Crane, Hoist or Lift Operator	17		17
712201	Driller	7	11	18
712202	Miner		125	125
712203	Shot Firer		2	2
721201	Earthmoving Plant Operator	72	100	172
721203	Bulldozer Operator		11	11
721204	Excavator Operator		17	17
721206	Loader Operator		26	26

Mining Qualifications Authority

733101	Truck Driver		2	2
821103	Earthmoving Worker		50	50
821902	Drillers Assistant		20	20
	Total	575	1635	2210

Northern Cape

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
3	Technicians and Trade Workers(not specified)		2	2
132201	Finance Manager		1	1
133201	Engineering Manager	2	3	5
133503	Production or Operations Manager		6	6
133504	Operations Manager	3	1	4
136304	Foreman	17	6	23
139902	Environmental Manager		1	1
221101	Accountant		3	3
223101	Human Resource Advisor		1	1
223301	Training and Development Professional		1	1
224103	Statistician		1	1
224502	Valuer		3	3
224703	Skills Development Facilitator		1	1
231101	Aeroplane Pilot		1	1
232202	Surveyor	8	2	10
233101	Chemical Engineer	1	3	4
233105	Metallurgical Engineer	1	1	2
233201	Civil Engineer		3	3
233301	Electrical Engineer	8	6	14
233402	Electronics and Telecommunications Engineering Technologist		1	1
233501	Industrial Engineer		3	3
233502	Mechanical Engineer	12	5	17
233601	Mining Engineer	15	16	31
233603	Mining Engineering Technologist	1	1	2
234302	Environmental Consultant		3	3
234401	Geologist	11	6	17
234402	Geophysicist	1		1
234902	Metallurgist		2	2
251301	Environmental Health Officer		1	1
311903	Environmental Science Technician		1	1
312101	Architectural Draftsperson	1		1
312302	Electrical Engineering Technician	3	15	18
312502	Mechanical Engineering Technician	7	4	11
312901	Maintenance Planner		1	1
312903	Mining Technician	10		10

Mining Qualifications Authority

321202	Diesel Motor Mechanic	32	7	39
322201	Sheet Metal Trades Worker	5		5
322303	Welder or Welder		5	5
323201	Fitter	5	12	17
323202	Fitter and Turner	5	5	10
323501	Millwright	15	4	19
341101	Electrician	12	20	32
442204	Private Investigator		1	1
451201	Driving Instructor		4	4
591103	Purchasing Officer		9	9
712101	Crane, Hoist or Lift Operator		7	7
712202	Miner		6	6
721203	Bulldozer Operator		7	7
721204	Excavator Operator	54	4	58
721206	Loader Operator		6	6
731301	Train Driver	3		3
821701	Construction Rigger	1		1
821902	Drillers Assistant		13	13
	Total	235	217	452

Limpopo

Code	Occupation	Total scarcity
3	Technicians and Trade Workers(not specified)	8
133201	Engineering Manager	1
133503	Production or Operations Manager	21
133504	Operations Manager	1
136304	Foreman	7
139902	Environmental Manager	2
221101	Accountant	9
221102	Management Accountant	14
223101	Human Resource Advisor	9
223301	Training and Development Professional	1
224703	Skills Development Facilitator	1
232202	Surveyor	9
233101	Chemical Engineer	4
233301	Electrical Engineer	12
233501	Industrial Engineer	5
233502	Mechanical Engineer	12
233601	Mining Engineer	20
233603	Mining Engineering Technologist	4
234302	Environmental Consultant	4

Mining Qualifications Authority

234401	Geologist	14
234902	Metallurgist	23
251301	Environmental Health Officer	1
311901	Earth and Atmospheric Science Technician	9
312201	Civil Engineering Draftsperson	2
312301	Electrical Engineering Draftsperson	1
312302	Electrical Engineering Technician	9
312502	Mechanical Engineering Technician	5
312601	Safety Inspector	1
312903	Mining Technician	15
321202	Diesel Motor Mechanic	53
322201	Sheet Metal Trades Worker	40
322303	Welder or Welder	28
323201	Fitter	14
323202	Fitter and Turner	58
323501	Millwright	38
331201	Carpenter and Joiner	1
341101	Electrician	78
399401	Jeweller	1
511201	Office Administrator	1
551201	Bookkeeper	1
712101	Crane, Hoist or Lift Operator	9
712201	Driller	28
712202	Miner	41
712901	Boiler or Engine Operator	14
721206	Loader Operator	18
821701	Construction Rigger	2
	Total	649

North West

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
1	Directors and Corporate Managers(not specified)		2	2
2	Professionals(not specified)		2	2
3	Technicians and Trade Workers(not specified)		2	2
7	Machine Operators and Drivers(not specified)	32		32
132201	Finance Manager		3	3
132301	Personnel or Human Resource Manager		3	3
133201	Engineering Manager	3	4	7
133503	Production or Operations Manager	15	11	26
221101	Accountant	1	1	2

Mining Qualifications Authority

223301	Training and Development Professional	6	2	8
224301	Economist		9	9
224502	Valuer	2		2
224701	Management Consultant		2	2
224703	Skills Development Facilitator		5	5
232202	Surveyor	13	25	38
233101	Chemical Engineer		13	13
233102	Chemical Engineering Technologist		7	7
233105	Metallurgical Engineer		14	14
233201	Civil Engineer	7		7
233301	Electrical Engineer	18	7	25
233502	Mechanical Engineer	10	19	29
233601	Mining Engineer	5	13	18
233603	Mining Engineering Technologist	11		11
234201	Chemist		1	1
234401	Geologist	6	48	54
234402	Geophysicist	5	2	7
234902	Metallurgist	9	12	21
251301	Environmental Health Officer		16	16
312101	Architectural Draftsperson		5	5
312106	Surveying or Cartographic Technician	4	1	5
312201	Civil Engineering Draftsperson		1	1
312301	Electrical Engineering Draftsperson	6		6
312302	Electrical Engineering Technician	34	25	59
312502	Mechanical Engineering Technician		8	8
312601	Safety Inspector		1	1
312901	Maintenance Planner	6	9	15
312903	Mining Technician		196	196
321202	Diesel Motor Mechanic	6	141	147
322301	Metal Fabricator	8	4	12
322303	Welder or Welder	13	35	48
323201	Fitter	14	135	149
323202	Fitter and Turner	34	32	66
323501	Millwright	20	51	71
341101	Electrician	48	139	187
532101	Data Entry Operator		12	12
551101	Accounts Clerk		3	3
591103	Purchasing Officer		2	2
711104	Stone Processing Machine Operator		44	44
712101	Crane, Hoist or Lift Operator	2	32	34
712201	Driller	572	251	823
712202	Miner		145	145
721201	Earthmoving Plant Operator	41	48	89
721204	Excavator Operator		14	14
721206	Loader Operator	60	72	132
733101	Truck Driver		26	26

Mining Qualifications Authority

821701	Construction Rigger		29	29
821902	Drillers Assistant		130	130
899301	Handyperson		1	1
	Total	1013	1820	2833

Western Cape

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
2	Professionals(not specified)		3	3
3	Technicians and Trade Workers(not specified)		18	18
133503	Production or Operations Manager	3		3
232303	Jewellery Designer	4		4
233502	Mechanical Engineer		1	1
233601	Mining Engineer		6	6
234402	Geophysicist		4	4
312101	Architectural Draftsperson		1	1
399401	Jeweller	23	26	49
712201	Driller		5	5
821904	Mining Support Worker	79		79
	Total	109	64	173

Kwa-Zulu Natal

Code	Occupation	Absolute scarcity	Relative scarcity	Total scarcity
133503	Production or Operations Manager	2		2
136304	Foreman	4		4
224703	Skills Development Facilitator	2		2
232202	Surveyor	2		2
233301	Electrical Engineer	2	3	5
233502	Mechanical Engineer		4	4
233601	Mining Engineer	2	1	3
233603	Mining Engineering Technologist		1	1
234401	Geologist		1	1
263102	Network Administrator		2	2
312302	Electrical Engineering Technician		2	2
312502	Mechanical Engineering Technician	1		1
312903	Mining Technician	44		44
321202	Diesel Motor Mechanic		3	3
322303	Welder or Welder		1	1
323201	Fitter	4	6	10
323202	Fitter and Turner	4		4
323501	Millwright	2		2
331101	Bricklayer	1		1
341101	Electrician	1	19	20
399401	Jeweller	6		6
712202	Miner		6	6
721201	Earthmoving Plant Operator		4	4
721206	Loader Operator		3	3
821701	Construction Rigger	1		1
	Total	77	55	132