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Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Mining and Minerals

Registered by NSB 06, Manufacturing, Engineering and Technology, publishes the following qualifications unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualifications and unit standard. The qualifications and unit standard can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the unit standards should reach SAQA at the address ***below and no later than 23 October 2004.*** All correspondence should be marked **Standards Setting – SGB for Mining and Minerals** and addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate in Mineral Processing (Mineral Sands Extraction)

SAQA QUAL ID	*QUALIFICATION TITLE*	
49042	Further Education and Training Certificate in Mineral Processing (Mineral Sands Extraction)	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-4-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
150	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a Mineral Sands Recovery plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of the mineral sands recovery plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a mineral sands plant.

It is intended that qualifying learners are able to:

> Communicate effectively in the workplace and a variety of other contexts
> Communicate effectively in the workplace and a variety of other contexts in a second language
> Apply mathematical principles in practical applications
> Sustain occupational health and safety in the workplace
> Control mineral sand extraction processes
> Dewater product
> Supervise work in a mineral sands extraction plant
> Monitor and control a metallurgical plant from a control room

Rationale for this qualification

Mineral Sands Extraction focuses on extraction of valuable minerals out of beach sands and other alluvial deposits.

This is the third qualification in a learning pathway, starting with the National Certificate in Minerals Processing, level 2, designed for learners in the mining and minerals sector who want to follow a career in Mineral Sands Extraction. The qualification reflects the skills, knowledge and understanding required to function effectively within a Mineral Sands Extraction plant.

Mineral Sands Extraction operations require a sound knowledge of materials transporting and handling and process control in gravity concentration, magnetic recovery and pyro metallurgical processes. The mining sector put emphasis on safety and a healthy working environment within a Mineral Sands Extraction plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the mining and minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining

and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations.

The National Certificate in Mineral Sands Extraction (L4) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.

The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 5 in Mineral processing or Metallurgy.

The National Certificate in Mineral Sands Extraction NQF Level 4 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

N

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification are already competent in:
> National Certificate in Mineral Processing, Level 3

Recognition of prior learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 12 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Rules of combination

Fundamentals:

> 20 Communications credits from the list specified
> 16 Mathematics from the list specified

Core:

> 66 Credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in a mineral sand extraction workplace.

Electives:

A minimum of 28 credits must be selected from the elective components to make up the total requirement of 151 credits for this qualification.

Summary of credit composition

Fundamentals - Core - Elective - Total

> Level 3 - 20 - 0- 0 - 20

> Level 4 - 36 - 67 - 28 - 131
> Total - 56 - 67 - 28 - 151

Motivation for allocation of credits

> Due to the different process options employed in the Mineral Sand Extraction plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

> A minimum of 151 credits is required to complete the qualification.

Motivation for the Level of the Qualification

> Mote than 72 credits towards unit standards included in this qualification are at level 4

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to control a mineral sands extraction process and an ability to meet safety, health and environmental specifications.
3. Extract minerals in a mineral extraction plant
4. Dewater materials in a mineral sands extraction plant
5. Supervise a work unit to run a mineral sand extraction process.

Critical cross-field outcomes

This qualification addresses the following critical cross-field outcomes. The way in which the critical cross-field outcomes are addressed is presented in detail in the unit standards outlined in the Annexures.

Consistency of exit level outcomes with critical crossfield outcomes

1. Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made. Equivalent Exit Level Outcome 1,2,3 and 4
2. Working effectively with others as a member of a team, group, organization and community. Equivalent Exit Level Outcome 1 and 5
3. Organising and managing oneself and one's activities responsibly and effectively. Equivalent Exit Level Outcome 1,2 and 5
4. Collecting, analyzing, organizing and critically evaluating information.□Equivalent Exit Level Outcome 1,2,3,4 and 5
5. Communicating effectively using visual, mathematical and/or language skills. Equivalent Exit Level Outcome 1 and 5
6. Using science and technology effectively and critically, showing responsibility toward the environment and health of others. Equivalent Exit Level Outcome 1,2,3 and 4
7. Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation. Equivalent Exit Level Outcome 1
8. Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:□

> Reflecting on and exploring a variety of strategies to learn more effectively. Equivalent Exit Level Outcome 1,2,3,4 and 5
> Participating as responsible citizens in the life of local, national and global communities. Equivalent Exit Level Outcome 1,2,3,4 and 5
> Being culturally and aesthetically sensitive across a range of contexts. Equivalent Exit Level Outcome 1,2,3,4 and 5
> Exploring education and career opportunities. Equivalent Exit Level Outcome 1,2,3,4 and 5
> Developing entrepreneurial opportunities. Equivalent Exit Level Outcome 1,2,3,4 and 5

Learning programs directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:

> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life and local, national and global communities
> Being culturally and aesthetically sensitive across a range of social context
> Exploring education and career opportunities and developing entrepreneurial opportunities

ASSOCIATED ASSESSMENT CRITERIA

1. > Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2. > The process is monitored and controlled according to mineral sands extraction specifications.
> A clean and safe work environment is maintained
> Problems relating to the mineral sands extraction process are solved using sector acceptable processes and procedures

3. > Materials are classified and separated according to mineral sand extraction specifications
> Problems relating to the mineral sand extraction processes are solved using acceptable processes and procedures

4. > Materials are dewatered according to mineral sands extraction specifications
> Problems relating to the dewatering of materials in a mineral sands extraction plants are solved using sector acceptable processes and procedures

5. > Tasks allocated to team members are appropriate to process requirements and level of skill of team members.
> Tasks allocated to team members are allocated in a consistent and timely manner.
> Team members are coached on processes and procedures as they are applied in a mineral sands extraction plant to ensure production targets are met and efficiencies maintained.

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

National qualification sites on the Internet were explored in order to find qualifications related to Mineral Sand Extraction.
> Australia: National Training Information Services (www.ntis.gov.au) MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz) Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

Results Found:
> It was clearly evident that those found were not suitable since no Mineral sand extraction is mentioned.
> In New Zealand only Gold and Alluvial Gold qualifications could be found. These qualifications have very little in common with Mineral Sand Extraction.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral processing/Metallurgy NQF Level 5). The fundamental unit standards should give the learner access to any qualification at NQF level 5, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:

To be registered as an assessor with the relevant ETQA

The assessor must have completed:
> A similar qualification or from the same family of qualifications, at or above the level of the qualifications.

Assessors should keep the following general principles in mind when designing and conducting assessments:

1. Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
2. Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.

All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range statements

The unit standards provide the details of the ranges within which candidates are required to perform.

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	7854 Provide First Aid	Level 4	4	Registered
Core	10981 Supervise work unit to achieve work unit objectives (individuals and teams)	Level 4	12	Registered
Core	11105 Monitor and control a metallurgical plant from a control room	Level 4	20	Registered
Core	15313 Control a drying operation in a metallurgical plant	Level 4	13	Registered
Core	110161 Control a gravity concentration process in a metallurgical plant	Level 4	17	Registered
Elective	110405 Control a backfill production process	Level 4	15	Registered
Elective	110420 Generate steam by means of a coal-burning boiler	Level 4	18	Registered
Elective	110462 Commission a fluidized bed roaster	Level 4	13	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8971 Analyse and respond to a variety of literary texts	Level 3	5	Registered
Fundamental	7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	2	Registered
Fundamental	7481 Find the derivatives and integrals of a range of functions including the trigonometric functions and apply these to problems	Level 4	4	Registered
Fundamental	7483 Solve problems involving sequences and series in real and simulated situations	Level 4	2	Registered
Fundamental	7484 Describe, represent, analyse and explain changes in shape and motion in 2- and 3-dimensional space with justification	Level 4	4	Registered

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Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8977 Evaluate literary texts	Level 4	5	Registered
Fundamental	8979 Use language and communication in occupational learning programmes	Level 4	5	Registered
Fundamental	9016 Represent analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 4	4	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate: Mineral Processing (Gold Extraction)

SAQA QUAL ID	*QUALIFICATION TITLE*	
49051	Further Education and Training Certificate: Mineral Processing (Gold Extraction)	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-4-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
139	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a gold extraction plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of a Gold Extraction plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a Gold Extraction plant.

It is intended that qualifying learners are able to:

> Communicate effectively in the workplace and a variety of other contexts
> Communicate effectively in the workplace and a variety of other contexts in a second language
> Apply mathematical principles in practical applications
> Sustain occupational safety and health in the workplace
> Control milling and leaching operations
> Control tailings dam operations
> Supervise a work unit

Rationale for the qualification:

Gold Extraction focuses on milling, leaching with cyanide, extraction or precipitation and pyro-metallurgical recovery and/or refining of the gold.

This is the third and last qualification in this learning pathway designed for learners in the mining and minerals sector who want to follow a career in Gold Extraction in the areas of crushing, milling, leaching with cyanide, extraction or precipitation and pyro-metallurgical recovery and/or refining of the gold. The learning pathway commences with the National Certificate in Mineral Processing: NQF level 2 and progresses to NQF level 4 for candidates learning and working in a Gold Extraction plant. The qualification reflects the skills, knowledge and understanding required to function effectively within a Gold Extraction plant/metallurgical plant.

Gold Extraction operations require a sound knowledge of process control of crushing, milling, leaching, precipitation or extraction and smelting. The mining sector put emphasis on safety and a healthy working environment within the Gold Extraction plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the Mining and Minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining

and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related fabrication and extraction field.

The National Certificate in Gold Extraction (L4) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.
The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 5 in Mineral processing or Metallurgy.

The National Certificate in Gold Extraction: NQF Level 4 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

N

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification are already competent in the following areas:

National certificate in gold extraction at NQF level 3 or learners are already competent in:
> Mathematical literacy at NQF level 3.
> Communication at NQF level 3.

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 12 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors

QUALIFICATION RULES

Rules of Combination

Fundamental:

> 20 Communications credits from the list specified
> 20 Second language credits from the list specified
> 16 Mathematics credits from the list specified

The fundamental component complies with the requirement for an FETC.

Core:
> 45 credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in the Gold Extraction Plant.

Elective:

A total of 38 credits (minimum) to be obtained for this qualification from the list specified in elective componentsn.

Summary of credit composition

Fundamental - Core - Elective - Total
Level 3 - 56 - 71 - 38 - 140

Motivation for allocation of credits

> Due to the different process options employed in the Gold Extraction plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

A minimum of 165 credits is required to complete the qualification.

> Motivation for the Level of the Qualification

> More than 72 credits towards unit standards included in this qualification are at level 4

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to oversee a milling process in a gold extraction plant
3. Demonstrate an understanding of how to oversee a leaching process in a gold extraction plant.
4. Demonstrate understanding of how to control a tailings dam operation process
5. Supervise work unit to achieve work unit objectives (individuals and teams)

Critical cross field outcomes

This qualification addresses the following critical cross-field outcomes. The way in which the critical cross-field outcomes are addressed is presented in detail in the unit standards outlined in the Annexures.

Consistency of exit level outcomes with critical crossfield outcomes

1. Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.
Relates to all Exit Level Outcome

2. Working effectively with others as a member of a team, group, organization and community.
Relates to the following Exit Level Outcome:
> Communicate and solve problems in a variety of ways
> Supervise work unit to achieve work unit objectives (individuals and teams)

3. Organising and managing oneself and one's activities responsibly and effectively
Relates to all Exit Level Outcome

4. Collecting, analyzing, organizing and critically evaluating information.
Relates to all Exit Level Outcome

5. Communicating effectively using visual, mathematical and/or language skills
Relates to all Exit Level Outcome.

6. Using science and technology effectively and critically, showing responsibility toward the environment and health of others
Relates to the following Exit Level Outcome
> Communicate and solve problems in a variety of ways
> Demonstrate understanding of how to control a tailings dam operation process
> Supervise work unit to achieve work unit objectives (individuals and teams)

7. Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation
Relates to the following Exit Level Outcome
1

8. Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:□

> Reflecting on and exploring a variety of strategies to learn more effectively.
Relates to all Exit Level Outcome

> Participating as responsible citizens in the life of local, national and global communities
Relates to all Exit Level Outcome

> Being culturally and aesthetically sensitive across a range of contexts
Relates to all Exit Level Outcome

> Exploring education and career opportunities
Relates to all Exit Level Outcome

> Developing entrepreneurial opportunities
Relates to all Exit Level Outcome

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:
> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life of local, national and global communities
> Being culturally and aesthetically sensitive across a range of social contexts
> Exploring education and career opportunities; and developing entrepreneurial opportunities

ASSOCIATED ASSESSMENT CRITERIA

1. > Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2. > The process is monitored and controlled according to Gold Extraction specifications
> A clean and safe work environment is maintained
> Problems relating to the Gold Extraction process are solved using sector acceptable procedure

3. > The process is monitored and controlled according to Gold Extraction specifications
> A clean and safe work environment is maintained
> Problems relating to the Gold Extraction process are solved using sector acceptable procedures

4. > The tailings dam operation is monitored and controlled in accordance with specified requirements.
> Problems relating to slimes dam operations are solved using sector acceptable processes and procedures
> The legal requirements and the risks associated with a slimes dam operation are understood.

5. > The work unit is supervised in accordance with gold extraction specifications.
> A clean and safe work environment is maintained.
> Problems relating to the gold extraction process are solved using sector acceptable procedures

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.

Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

National Qualification sites on the internet were explored in order to find qualifications related to Gold Extraction.

> Australia: National Training Information Services (www.ntis.gov.au) MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz) Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

Results found
> In Australia no such qualification could be found.
> In New Zealand separate Gold and Alluvial Gold qualifications were found.

This proposed Gold Extraction qualification is much more generic since it incorporates all gold recovery processes.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral Processing/Metallurgy NQF Level 5). The fundamental unit standards should give the learner access to any qualification at NQF level 5, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs: To be registered as an assessor with the relevant ETQAThe assessor must have completed: A similar qualification or from the same family of qualifications, at or above the level of the qualification.

Notes

Assessors should keep the following general principles in mind when designing and conducting assessments:

> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.

All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range Statements
□
The unit standards provide the details of the ranges within which candidates are required to perform.

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	7854 Provide First Aid	Level 4	4	Registered

Core	10981 Supervise work unit to achieve work unit objectives (individuals and teams)	Level 4	12	Registered
Core	11078 Control a milling and classification operation in a metallurgical plant	Level 4	17	Registered
Core	11087 Oversee a leaching operation in a metallurgical plant	Level 4	22	Registered
Elective	11105 Monitor and control a metallurgical plant from a control room	Level 4	20	Registered
Elective	15293 Oversee a crushing and screening operation in a metallurgical plant	Level 4	24	Registered
Elective	110161 Control a gravity concentration process in a metallurgical plant	Level 4	17	Registered
Elective	110398 Control a gold smelting operation in a metallurgical plant	Level 4	13	Registered
Elective	110405 Control a backfill production process	Level 4	15	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8971 Analyse and respond to a variety of literary texts	Level 3	5	Registered
Fundamental	7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	2	Registered
Fundamental	7481 Find the derivatives and integrals of a range of functions including the trigonometric functions and apply these to problems	Level 4	4	Registered
Fundamental	7483 Solve problems involving sequences and series in real and simulated situations	Level 4	2	Registered
Fundamental	7484 Describe, represent, analyse and explain changes in shape and motion in 2- and 3-dimensional space with justification	Level 4	4	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8977 Evaluate literary texts	Level 4	5	Registered
Fundamental	8979 Use language and communication in occupational learning programmes	Level 4	5	Registered
Fundamental	9016 Represent analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 4	4	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

Further Education and Training Certificate: Mineral Processing (Platinum Extraction)

SAQA QUAL ID	QUALIFICATION TITLE	
49050	Further Education and Training Certificate: Mineral Processing (Platinum Extraction)	
SGB NAME	SGB Mining and Minerals	
ABET BAND	PROVIDER NAME	
Undefined		
QUALIFICATION CODE	QUAL TYPE	SUBFIELD
MET-4-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	NQF LEVEL	QUALIFICATION CLASS
147	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a platinum extraction plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of a Platinum Extraction plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a Platinum Extraction plant.

It is intended that qualifying learners are able to:

> Communicate effectively in the workplace and a variety of other contexts
> Communicate effectively in the workplace and a variety of other contexts in a second language
> Apply mathematical principles in practical applications
> Sustain health and safety in the workplace
> Control milling and classification operations
> Control tailings dam operations
> Supervise a work unit

Rationale

Platinum Extraction focuses on milling, froth flotation, drying and pyro-metallurgical recovery of the Platinum.

This is the third and last qualification in this learning pathway designed for learners in the mining and minerals sector who want to follow a career in Platinum Extraction in the areas of crushing, milling, froth flotation, drying and pyro-metallurgical recovery of the Platinum. The learning pathway commences with the National Certificate in Mineral Processing: NQF level 2 and progresses to NQF level 4 for candidates learning and working in a Platinum Extraction plant. The qualification reflects the skills, knowledge and understanding required to function effectively within a Platinum Extraction plant/metallurgical plant.

Platinum Extraction operations require a sound knowledge of process control of crushing, milling, froth flotation, drying and smelting. The mining sector put emphasis on safety and a healthy working environment within the Platinum Extraction plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the Mining and Minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related fabrication and extraction field.

The National Certificate in Platinum Extraction (L4) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.
The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 5 in Mineral processing or Metallurgy.

The National Certificate in Platinum Extraction: NQF Level 4 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification are already competent in the following areas:

National certificate in Platinum Extraction at NQF level 3 or learners are already competent in:
> Mathematical literacy at NQF level 3.
> Communication at NQF level 3.

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 12 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Fundamental :
> 20 Communications credits from the list specified
> 20 Second language credits from the list specified
> 16 Mathematics credits from the list specified

The fundamental component complies with the requirement for an FETC.

Core :
> 53 credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in the Platinum Extraction Plant.

Elective :

A total of 38 credits (minimum) to be obtained for this qualification from elective component, which must include those for competencies, required at the applicable workplace, not yet represented in the core.

Summary of credit composition

> Level 3
Fundamental - Core - Elective - Total
56 - 79 - 38 - 173

Motivation for allocation of credits

Due to the different process options employed in the Platinum Extraction plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

A minimum of 173 credits are required to complete the qualification.

Motivation for the Level of the Qualification

More than 72 credits towards unit standards included in this qualification are at level 4

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to oversee a milling process in a platinum extraction Plant.
3. Demonstrate an understanding of how to control a Platinum extraction process from a control room
4. Demonstrate understanding of how to control a tailings dam operation process
5. Supervise work unit to achieve work unit objectives (individuals and teams)

Critical cross field outcomes

This qualification addresses the following critical cross-field outcomes. The way in which the critical cross-field outcomes are addressed is presented in detail in the unit standards outlined in the Annexures.

Consistency of exit level outcomes with critical crossfield outcomes

Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.
> Relates to all equivalent exit level outcomes

Working effectively with others as a member of a team, group, organization and community.
> Relates to equivalent exit level outcomes 1 and 5

Organising and managing oneself and one's activities responsibly and effectively
> Relates to all equivalent exit level outcomes

Collecting, analyzing, organizing and critically evaluating information.
> Relates to all equivalent exit level outcomes

Communicating effectively using visual, mathematical and/or language skills
> Relates to all equivalent exit level outcomes

Using science and technology effectively and critically, showing responsibility toward the environment and health of others
>Relates to equivalent exit level outcomes 1,4 and 5

Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation
> Relates to equivalent exit level outcomes 1

Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:

Reflecting on and exploring a variety of strategies to learn more effectively
> Relates to all equivalent exit level outcomes
Participating as responsible citizens in the life of local, national and global communities
> Relates to all equivalent exit level outcomes
Being culturally and aesthetically sensitive across a range of contexts
> Relates to all equivalent exit level outcomes
Exploring education and career opportunities
> Relates to all equivalent exit level outcomes
Developing entrepreneurial opportunities

> Relates to all equivalent exit level outcomes

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:

> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life of local, national and global communities
> Being culturally and aesthetically sensitive across a range of social contexts
> Exploring education and career opportunities; and developing entrepreneurial opportunities

ASSOCIATED ASSESSMENT CRITERIA

1.
> Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2.
> The process is monitored and controlled according to Platinum Extraction specifications
> A clean and safe work environment is maintained
> Problems relating to the Platinum Extraction process are solved using sector acceptable procedures

3.
> The process is monitored and controlled according to Platinum Extraction specifications
> A clean and safe work environment is maintained
> Problems relating to the Platinum Extraction process are solved using sector acceptable procedures

4.□
> The tailings dam operation is monitored and controlled in accordance with specified requirements.
> Problems relating to slimes dam operations are solved using sector acceptable processes and procedures
> The legal requirements and the risks associated with a slimes dam operation are understood.

5.
> The work unit is supervised in accordance with platinum extraction specifications.
> A clean and safe work environment is maintained.
> Problems relating to the platinum extraction process are solved using sector acceptable procedures.

Integrated Assessment:
Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

International Comparability

National Qualification sites on the internet were explored in order to find qualifications related to Platinum Extraction.

> Australia: National Training Information Services (www.ntis.gov.au)
> MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz)
> Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

Results found
> In Australia no such qualification could be found.
> In New Zealand separate Gold and Alluvial Gold qualifications were found.

The New Zealand gold qualification is not suitable to use as a base for a platinum qualification.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral Processing/Metallurgy NQF Level 5). The fundamental unit standards should give the learner access to any qualification at NQF level 5, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Criteria for the registration of assessors
For an applicant to register as an assessor, the applicant needs:

To be registered as an assessor with the relevant ETQA
The assessor must have completed:
A similar qualification or from the same family of qualifications, at or above the level of the qualification

Assessors should keep the following general principles in mind when designing and conducting assessments:
> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
> All assessments should be conducted in line with the following well documented principles of assessment as defined below:

Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent:The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range Statements
□
The unit standards provide the details of the ranges within which candidates are required to perform.

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	7854 Provide First Aid	Level 4	4	Registered
Core	10981 Supervise work unit to achieve work unit objectives (individuals and teams)	Level 4	12	Registered
Core	11078 Control a milling and classification operation in a metallurgical plant	Level 4	17	Registered
Core	11105 Monitor and control a metallurgical plant from a control room	Level 4	20	Registered
Elective	15293 Oversee a crushing and screening operation in a metallurgical plant	Level 4	24	Registered
Elective	115753 Conduct outcomes-based assessment	Level 5	15	Registered

Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8971 Analyse and respond to a variety of literary texts	Level 3	5	Registered
Fundamental	7466 Represent and operate on complex numbers in non-trivial situations	Level 4	2	Registered
Fundamental	7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	2	Registered
Fundamental	7470 Work with a wide range of patterns and inverses of functions and solve related problems	Level 4	6	Registered
Fundamental	7483 Solve problems involving sequences and series in real and simulated situations	Level 4	2	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8977 Evaluate literary texts	Level 4	5	Registered
Fundamental	8979 Use language and communication in occupational learning programmes	Level 4	5	Registered
Fundamental	12417 Measure, estimate & calculate physical quantities & explore, critique & prove geometrical relationships in 2 and 3 dimensional space in the life and workplace of adult with increasing responsibilities	Level 4	4	Reregistered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Lump Ore Beneficiation

SAQA QUAL ID	*QUALIFICATION TITLE*	
49045	National Certificate: Lump Ore Beneficiation	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-2-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
158	Level 2	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a lump ore beneficiation plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of the lump ore beneficiation plant/metallurgical plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a lump ore beneficiation plant.

It is intended that qualifying learners are able to:
> Communicate effectively in the workplace and a variety of other contexts
> Apply mathematical principles in practical applications
> Sustain Occupational Health and Safety in the workplace
> Conduct materials handling and transport operations
> Conduct process control operations
> Separate minerals

Rationale

Lump Ore Beneficiation focuses on Dense Medium separation and jig concentration in the beneficiation of Coal, Heavy Minerals and Diamonds.

This is the first qualification in a learning pathway designed for learners in the mining and minerals sector who want to follow a career in Lump Ore Beneficiation in the areas of Dense Medium and Jig Concentration. The learning pathway commences with the National Certificate in Lump Ore Beneficiation: NQF level 2 and progresses to NQF level4 for candidates learning and working in a Lump Ore Beneficiation plant. The qualification reflects the skills, knowledge and understanding required to function effectively within Lump Ore Beneficiation metallurgical plant.

Lump Ore Beneficiation operations require a sound knowledge of materials transporting and handling, process control and separating materials associated with dense medium and jig concentration operations. The mining sector put emphasis on safety and healthy working environment within Lump Ore Beneficiation metallurgical plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the Mining and Minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related fabrication and extraction field.

The National Certificate in Lump Ore Beneficiation (L2) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.
The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 3 in Mineral processing or Metallurgy.

The National Certificate in Lump Ore Beneficiation: NQF Level 2 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning programs towards this qualification are already competent in:

National Introductory Certificate in Minerals Processing level 1 or equivalent.

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The learner and the assessor will jointly decide on how prior learning will be demonstrated.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Fundamentals:
All Fundamentals unit standards are compulsory.

Core:
All core unit standards are compulsory.

Electives:
Specialisation 1:
Dense Medium Separation with options: Coal/Heavy Minerals/Diamonds.
Candidates selecting one option must achieve all the credits under that option.

Specialisation 2:
Jig concentration
Candidates selecting this option must achieve all of the credits under jig concentration.

Additional Electives:
The balance of credits must be chosen from the additional list of elective unit standards provided considering the competencies required at the applicable workplace.

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways.

2. Demonstrate an understanding of how to control a lump ore beneficiation process and an ability to meet safety, health and environmental specifications

3. Separate materials in a dense medium process

4. Transport and Handle materials in a dense medium process

ASSOCIATED ASSESSMENT CRITERIA

1.
> Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2.
> The process is monitored and controlled according to lump ore beneficiation specifications
> A clean and safe work environment is maintained
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and procedures

3.
> Materials are classified and separated according to lump ore beneficiation specifications
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and procedures

4.
> Materials are transported and handled according to lump ore beneficiation specifications
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and procedures

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

NC: IN lump Ore beneficiation has been compared to:

> Australia: National Training Information Services (www.ntis.gov.au)
MNM 20203 certificate II in metallurgical mining operations. Lump Ore Beneficiation does not compare favourably with this qualification.

> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz)
Extractive metallurgical processes metalliferous gold.
The Gold and Alluvial Gold qualifications found have very little in common with Lump Ore Beneficiation because of both process and content differences.

> Scotland: The Scottish Qualification Authority (www.sqa.org.uk) No relevant qualification could be found.

> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us). No relevant qualification could be found.

Although coal beneficiation was mentioned on several countries, no record of a relevant certificate/qualification could be found.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral processing/Metallurgy NQF Level 3) The fundamental unit standards should give the learner access to any qualification at NQF level 3, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors should keep the following general principles in mind when designing and conducting assessments:

> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.

> All assessments should be conducted in line with the following well documented principles of assessment as defined below:

Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range statements

The unit standards provide the details of the ranges within which candidates are required to perform.

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	9823 Perform basic life support and/or first aid procedures in emergencies	Level 1	5	Registered
Core	13167 Identify potential hazards and critical safety issues in the workplace	Level 1	2	Registered
Core	14656 Demonstrate an understanding of sexuality and sexually transmitted infections including HIV/AIDS	Level 1	5	Registered
Core	9022 Transfer a fluid by means of a centrifugal pump	Level 2	3	Registered
Core	9024 Separate liquid from solids by means of a thickener	Level 2	3	Registered
Core	9565 Control feed distribution by means of a mobile system	Level 2	2	Registered
Core	9571 De-water material by means of a vibrating screen	Level 2	2	Registered
Core	9964 Apply health and safety to a work area	Level 2	3	Reregistered
Core	10571 Separate material by means of a cyclone	Level 2	4	Registered
Core	10576 Separate material by means of a vibrating screen	Level 2	4	Registered
Core	11106 Handle flocculant safely in a metallurgical plant	Level 2	4	Registered
Core	11650 Control the water reticulation in a metallurgical process	Level 2	4	Registered
Core	11655 Determine relative density by means of a density scale	Level 2	3	Registered

Core	11662 Transfer fluid by means of a positive displacement pump	Level 2	2	Registered
Core	11664 Control feed rate by means of a feeder	Level 2	2	Registered
Core	15323 Make-up a flocculent solution in a metallurgical plant	Level 2	4	Registered
Core	114104 Handle production waste	Level 2	3	Registered
Elective	9566 Seperate liquid form solids by means of a filter press	Level 2	6	Registered
Elective	9568 Separate liquid from solids by means of a vacuum disc filter	Level 2	6	Registered
Elective	9572 Maintain screen decks	Level 2	3	Registered
Elective	9573 Maintain a cyclone	Level 2	2	Registered
Elective	9578 Reclaim material by means of a brigde-type reclaimer	Level 2	4	Registered
Elective	9624 Take representative samples of slurries and liquids in a metallurgical process	Level 2	4	Registered
Elective	9635 Take a representative sample of solid material in a metalurgical process	Level 2	4	Registered
Elective	10535 Separate material by means of a hydrosizer	Level 2	4	Registered
Elective	10541 Direct the operation of an overhead crane	Level 2	3	Registered
Elective	10577 Separate liquid from solids by means of a vacuum drum filter	Level 2	6	Registered
Elective	10578 Separate liquid from solids by means of a belt filter	Level 2	6	Registered
Elective	10580 Separate liquid from solids by means of a pressurised drum filter	Level 2	6	Registered
Elective	11068 Crush material by means of a rotary breaker	Level 2	4	Registered
Elective	11074 Recover diamonds by means of hand sorting	Level 2	6	Registered
Elective	11102 Handle organic reagents safely in a metallurgical plant	Level 2	4	Registered
Elective	11652 De-sliming material by means of a screen	Level 2	2	Registered
Elective	11653 Separate liquid from solids by means of a centrifuge	Level 2	2	Registered
Elective	11654 Remove airborne dust by means of a scrubber	Level 2	3	Registered
Elective	11657 Generate compressed air	Level 2	3	Registered
Elective	12172 Remove airborne dust by means of a bag filter	Level 2	3	Registered
Elective	15290 Reclaim material from a tailings dam by means of high pressure monitoring	Level 2	3	Registered
Elective	15292 Control a blending and reclaiming process in a benefication plant	Level 2	4	Registered
Elective	15296 Deposit waste rock onto a waste dump by means of a belt conveyor system	Level 2	3	Registered
Elective	15329 Make-up a magnetite suspension in a metallurgical plant	Level 2	4	Registered
Elective	110117 Remove ferromagnetic material from a belt conveyor by means of an over belt magnet	Level 2	2	Registered
Elective	110155 Re-cloth a drum filter	Level 2	7	Registered
Elective	110195 Separate material by means of a centrifugal gravity concentration process	Level 2	5	Registered
Elective	110426 Make-up a Ferro-silicon suspension in a metallurgical plant	Level 2	4	Registered
Elective	115592 De-water material by means of a de-watering screen	Level 2	2	Registered
Elective	9562 Crush material by means of an impact-type crusher	Level 3	5	Registered
Fundamental	7469 Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2	Registered
Fundamental	7480 Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3	Registered
Fundamental	8962 Maintain and adapt oral communication	Level 2	5	Registered
Fundamental	8963 Access and use information from texts	Level 2	5	Registered
Fundamental	8964 Write for a defined context	Level 2	5	Registered
Fundamental	8967 Use language and communication in occupational learning programmes	Level 2	5	Registered
Fundamental	9007 Work with a range of patterns and functions and solve problems	Level 2	2	Registered
Fundamental	9009 Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	4	Registered
Fundamental	12444 Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Lump Ore Beneficiation

SAQA QUAL ID	*QUALIFICATION TITLE*	
49046	National Certificate: Lump Ore Beneficiation	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-3-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
120	Level 3	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a lump ore beneficiation plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of the lump ore beneficiation /metallurgical plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a lump ore beneficiation plant.

It is intended that qualifying learners are able to:

> Communicate in a variety of ways
> Use mathematics in real life situations
> Sustain safety and a healthy working environment
> Control tailings dam operations
> Supervise a work unit to achieve teams' objectives
> Monitor and Control a metallurgical plant from a control room
> Oversee dense medium separation process in a metallurgical plant
> Oversee a jig concentration process in a metallurgical plant.

Rationale for the qualification:

Lump Ore Beneficiation focuses on Dense Medium separation and jig concentration in the beneficiation of Coal, Heavy Minerals and Diamonds.

This is the second qualification in a learning pathway designed for learners in the mining and minerals sector who want to follow a career in Lump Ore Beneficiation in the areas of Dense Medium and Jig Concentration. The learning pathway commences with the National Certificate in Lump Ore Beneficiation: NQF level 2 and progresses to NQF level 4 for candidates learning and working in a Lump Ore Beneficiation plant. The qualification reflects the skills, knowledge and understanding required to function effectively within Lump Ore Beneficiation plant/metallurgical plant.

Lump Ore Beneficiation operations require a sound knowledge of materials transporting and handling, process control and separating materials associated with dense medium and jig concentration operations. The mining sector put emphasis on safety and healthy working environment within Lump Ore Beneficiation plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the Mining and

Minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related fabrication and extraction field.

The National Certificate in Lump Ore Beneficiation (L3) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.
The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 4 in Mineral processing or Metallurgy.

The National Certificate in Lump Ore Beneficiation: NQF Level 3 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning programs towards this qualification are already competent in the following areas:
> SAQA level 2 lump ore beneficiation or equivalent qualification.

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 14 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Credits and Rules of Combination

Fundamental
> 20 Communications credits from the list specified
> 16 Mathematics credits from the list specified

Core
38 credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in the mining and minerals workplace

Elective
A total of 46 credits (minimum) to be obtained for this qualification must be selected from either one oof the following streams: dense medium separation - coal or heavy minerals.
The balance of these 46 credits must be selected from annexure C.

Summary of credit composition
Fundamental-core-elective-total
Level 3-36-38-46-120

Motivation for allocation of credits

Due to the different process options employed in the Lump Ore Beneficiation plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.
A minimum of 120 credits is required to complete the qualification.

Motivation for the Level of the Qualification
More than 72 credits towards unit standards included in this qualification are at level 3

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways.
2. Demonstrate an understanding of how to control a lump ore beneficiation process and an ability to meet safety, health and environmental specifications.
3. Separate materials in a lump ore beneficiation process.
4. Oversee a work unit to run lump ore beneficiation process.
5. Demonstrate a familiarity with a process operation to crush materials.

SAQA Critical cross-field outcomes-Equivalent Exit Level Outcome

Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.-ELO 1,2,3 and 5
Working effectively with others as a member of a team, group, organization and community.-Exit Level Outcome 1 and 4
Organising and managing oneself and one's activities responsibly and effectively-Exit Level Outcome 1,2 and 4
Collecting, analyzing, organizing and critically evaluating information.-Exit Level Outcome 1,2 and 3
Communicating effectively using visual, mathematical and/or language skills-Exit Level Outcome 1 and 4
Using science and technology effectively and critically, showing responsibility toward the environment and health of others-Exit Level Outcome 1,2 and 3
Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation-Exit Level Outcome 1
Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:
Reflecting on and exploring a variety of strategies to learn more effectively-Exit Level Outcome 1,2,3,4 and 5
participating as responsible citizens in the life of local, national and global communities-Exit Level Outcome 1,2,3,4 and 5
being culturally and aesthetically sensitive across a range of contexts-Exit Level Outcome 1,2,3,4 and 5
exploring education and career opportunities-Exit Level Outcome 1,2,3,4 and 5
Developing entrepreneurial opportunities-Exit Level Outcome 1,2,3,4 and 5

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:
> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life of local, national and global communities
> Being culturally and aesthetically sensitive across a range of social contexts
> Exploring education and career opportunities; and developing entrepreneurial opportunities.

ASSOCIATED ASSESSMENT CRITERIA

1.
> Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment.

2.
> The process is monitored and controlled according to lump ore beneficiation specifications
> A clean and safe work environment is maintained
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and procedures.

3.
> Materials are classified and separated according to lump ore beneficiation specifications
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and

procedures.

4.
> Tasks allocated to team members are appropriate to process requirements and level of skill of team members
> Tasks allocated to team members are allocated in a consistent and timely manner
> Team members are coached on processes and procedures as they are applied in lump ore beneficiation plant to ensure production targets are met and efficiencies maintained.

5.
> Materials are crushed to meet beneficiation process requirements
> Problems relating to crushing are solved using sector acceptable processes and procedures.

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 14 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

National Qualification sites on the Internet were explored in order to find qualifications related to Lump Ore Beneficiation.

> Australia: National Training Information Services (www.ntis.gov.au)
> MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz)
> Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

Although coal beneficiation was mentioned on several countries, no record of a certificate could be found.
In Australia no relevant qualification could be found.
In New Zealand only Gold and Alluvial Gold qualifications could be found. These qualifications have very little in common with Lump Ore Beneficiation because of both process and content differences.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral processing/Metallurgy NQF Level 4). The fundamental unit standards should give the learner access to any qualification at NQF level 4, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors should keep the following general principles in mind when designing and conducting assessments:
> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
> All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.

> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

The unit standards provide the details of the ranges within which candidates are required to perform.

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	12483 Perform basic first aid	Level 2	4	Reregistered
Core	9576 Separate material by means of a dense medium cyclone	Level 3	6	Registered
Core	11069 Control medium density in a dense medium separation process	Level 3	6	Registered
Core	14798 Respond to hazardous conditions or emergencies	Level 3	10	Registered
Core	110424 Separate material by means of a dry high intensity magnetic separator	Level 3	3	Registered
Core	114951 Describe how to manage substance abuse and addiction in the workplace	Level 3	2	Registered
Core	14986 Demonstrate knowledge and understanding of fire exposures in order to manage the potential fire risk	Level 4	3	Registered
Core	14993 Demonstrate knowledge and understanding of the Mines Health and Safety Act, (Act 29 of 1996) and its application	Level 4	4	Registered
Elective	9562 Crush material by means of an impact-type crusher	Level 3	5	Registered
Elective	9574 Maintain belt conveyor components	Level 3	6	Registered
Elective	9575 Replace conveyor belting	Level 3	6	Registered
Elective	9577 Separate material by means of a dense medium bath type separator	Level 3	7	Registered
Elective	11092 Load material into railway trucks by means of an automated loading station	Level 3	9	Registered
Elective	15293 Oversee a crushing and screening operation in a metallurgical plant	Level 4	24	Registered
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	2	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Registered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4	Registered
Fundamental	14086 Work with a wide range of patterns and basic functions and solve related problems	Level 3	3	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Lump Ore Beneficiation

SAQA QUAL ID	*QUALIFICATION TITLE*	
49049	National Certificate: Lump Ore Beneficiation	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-3-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
135	Level 4	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a lump ore beneficiation plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of the lump ore beneficiation /metallurgical plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a lump ore beneficiation plant.

It is intended that qualifying learners are able to:

> Communicate in a variety of ways
> Use mathematics in real life situations
> Sustain safety and a healthy working environment
> Control tailings dam operations
> Supervise a work unit to achieve teams' objectives
> Monitor and Control a metallurgical plant from a control room
> Oversee dense medium separation process in a metallurgical plant
> Oversee a jig concentration process in a metallurgical plant.

Rationale for the qualification:

Lump Ore Beneficiation focuses on dense Medium separation and jig concentration in the beneficiation of coal, heavy minerals and diamonds.

This is the second qualification in a learning pathway designed for learners in the mining and minerals sector who want to follow a career in Lump Ore Beneficiation in the areas of Dense Medium and Jig Concentration. The learning pathway commences with the National Certificate in Lump Ore Beneficiation: NQF level 2 and progresses to NQF level 4 for candidates learning and working in a Lump Ore Beneficiation plant. The qualification reflects the skills, knowledge and understanding required to function effectively within Lump Ore Beneficiation plant/metallurgical plant.

Lump Ore Beneficiation operations require a sound knowledge of materials transporting and handling, process control and separating materials associated with dense medium and jig concentration operations. The mining sector put emphasis on safety and healthy working environment within Lump Ore Beneficiation plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the Mining and

Minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related fabrication and extraction field.

The National Certificate in Lump Ore Beneficiation (L4) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.
The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 5 in Mineral processing or Metallurgy.

The National Certificate in Lump Ore Beneficiation: NQF Level 4 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning programs towards this qualification are already competent in the following areas:
> NQF level 3 lump ore beneficiation certificate or equivalent qualification.

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 14 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Credits and Rules of Combination

Fundamental
> 20 Communications credits from the list specified
> 20 Second Language credits from the lists specified
> 16 Mathematics credits from the list specified
The fundamental component complies with the requirement for an FETC.

Core:
88 credits from the list specified are compulsory.
The unit standards in the core cover the main generic skills and knowledge required by people working in the mining and minerals workplace

Elective:
Candidates should select a minimum of 18 credits from the electives component. Candidates may add only one of the beneficiation specializations in dense medium or jig concentration.

Motivation for allocation of credits
Due to the different process options employed in the Lump Ore Beneficiation plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

A minimum of 135 credits is required to complete the qualification.

Motivation for the Level of the Qualification
More than 72 credits towards unit standards included in this qualification are at level 4

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to control a lump ore beneficiation process and an ability to meet safety, health and environmental specifications.
3. Separate materials in a lump ore beneficiation process
4. Supervise a work unit to run lump ore beneficiation process
5. Demonstrate a familiarity with a process operation to crush and screen materials.
6. Demonstrate understanding of how to control a tailings dam operation process.

SAQA Critical cross-field outcomes-Equivalent Exit Level Outcome
Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.-Exit Level Outcome 1,2,3, 5 and 6
Working effectively with others as a member of a team, group, organization and community.-Exit Level Outcome 1, 2, 4 and 6
Organising and managing oneself and one's activities responsibly and effectively-Exit Level Outcome 1,2, 4 and 6
Collecting, analyzing, organizing and critically evaluating information.-Exit Level Outcome 1,2, 3, 4 and 6
Communicating effectively using visual, mathematical and/or language skills-Exit Level Outcome 1, 4 and 6
Using science and technology effectively and critically, showing responsibility toward the environment and health of others-Exit Level Outcome 1,2,3,4 and 6
Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation-Exit Level Outcome 1 and 6
Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:-
Reflecting on and exploring a variety of strategies to learn more effectively-Exit Level Outcome 1,2,3,4,5 and 6
participating as responsible citizens in the life of local, national and global communities-Exit Level Outcome 1,2,3,4, 5 and 6
being culturally and aesthetically sensitive across a range of contexts-Exit Level Outcome 1,2,3,4, 5 and 6
exploring education and career opportunities-Exit Level Outcome 1,2,3,4, 5 and 6
Developing entrepreneurial opportunities-Exit Level Outcome 1,2,3,4,5 and 6

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:
> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life of local, national and global communities
> Being culturally and aesthetically sensitive across a range of social contexts
> Exploring education and career opportunities; and developing entrepreneurial opportunities.

ASSOCIATED ASSESSMENT CRITERIA

1.
> Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2.
> The process is monitored and controlled according to lump ore beneficiation specifications
> A clean and safe work environment is maintained
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and procedures.

3.
> Materials are classified and separated according to lump ore beneficiation specifications
> Problems relating to the lump ore beneficiation process are solved using sector acceptable processes and procedures.

4.
> Tasks allocated to team members are appropriate to process requirements and level of skill of team members
> Tasks allocated to team members are allocated in a consistent and timely manner
> Team members are coached on processes and procedures as they are applied in lump ore beneficiation plant to ensure production targets are met and efficiencies maintained.

5.
> Materials are crushed to meet beneficiation process requirements
> Problems relating to crushing are solved using sector acceptable processes and procedures.

6.
> The tailings dam operation is monitored and controlled in accordance with specified requirements
> Problems relating to slimes dam operations are solved using sector acceptable processes and procedures
> The legal requirements and the risks associated with a slimes dam operation are understood.

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 14 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure

assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

National Qualification sites on the Internet were explored in order to find qualifications related to Lump Ore Beneficiation.

> Australia: National Training Information Services (www.ntis.gov.au)
> MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz)
> Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

Although coal beneficiation was mentioned on several countries, no record of a certificate could be found.
In Australia no relevant qualification could be found.
In New Zealand only Gold and Alluvial Gold qualifications could be found. These qualifications have very little in common with Lump Ore Beneficiation because of both process and content differences.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral processing/Metallurgy NQF Level 5). The fundamental unit standards should give the learner access to any qualification at NQF level 5, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors should keep the following general principles in mind when designing and conducting assessments:
> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
> All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly

interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range Statements
The unit standards provide the details of the ranges within which candidates are required to perform

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	9823 Perform basic life support and/or first aid procedures in emergencies	Level 1	5	Registered
Core	10981 Supervise work unit to achieve work unit objectives (individuals and teams)	Level 4	12	Registered
Core	11105 Monitor and control a metallurgical plant from a control room	Level 4	20	Registered
Core	15293 Oversee a crushing and screening operation in a metallurgical plant	Level 4	24	Registered
Elective	110195 Separate material by means of a centrifugal gravity concentration process	Level 2	5	Registered
Elective	8978 Motivate judgements on selected literary texts	Level 4	5	Registered
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	2	Registered
Fundamental	7460 Use structured models to describe, represent and analyse shape and motion in 2- and 3-dimensional space	Level 3	4	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Registered
Fundamental	9010 Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations	Level 3	2	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	9013 Describe, apply, analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 3	4	Registered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Registered
Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Registered
Fundamental	8976 Write for a wide range of contexts	Level 4	5	Registered
Fundamental	8979 Use language and communication in occupational learning programmes	Level 4	5	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Mineral Processing

SAQA QUAL ID	*QUALIFICATION TITLE*	
49043	National Certificate: Mineral Processing	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-2-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
140	Level 2	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a Mineral Processing plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of the Mineral Processing plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a Mineral Processing plant.

It is intended that qualifying learners are able to:

> Communicate effectively in a variety of ways
> Apply mathematical principles in practical applications
> Sustain occupational health and safety in the workplace
> Conduct materials handling activities in a Mineral Processing Plant
> Control mineral recovery processes in a Mineral Processing Plant
> Leach metals
> Recover minerals
> Conduct Process control activities
> Handle hazardous substances

Rationale for the qualification:

Mineral Processing focuses on treatment of fine ore (smaller than 1mm topsize) to recover the valuable mineral/metal. It includes processes to recover Gold, Platinum, Uranium, Base Metals, minerals contained in beach sands and other minerals like Phosphate, Vermiculite and fluoride.

This is the first qualification in a learning pathway designed for learners in the mining and minerals sector who want to follow a career in Mineral Processing in the areas of the minerals mentioned above. The qualification reflects the skills, knowledge and understanding required to function effectively within a Mineral Processing plant/metallurgical plant.

Mineral Processing operations require a sound knowledge of materials transporting and handling and process control in the processes involved in the recovery of the minerals/metals.. The mining sector put emphasis on safety and healthy working environment within Mineral Processing plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and operational skills.

This qualification will enhance the status, productivity and employability of the learner within the mining and minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining

and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related mineral extraction field.

The National Certificate in Mineral Processing (L2) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.

The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 3 in Mineral processing Base Metals or Gold Extraction.

The National Certificate in Mineral Processing NQF Level 2 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification have already achieved the qualfication:
> Introduction to Mining and Mineral Sector Certificate

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 12 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records. The learner and the assessor will jointly decide on how prior learning will be demonstrated.

All such evidence should be judged according to the general principles of assessment described in the note to assessors

QUALIFICATION RULES

Fundamentals :

> 20 Communications credits from the list specified
> 16 Mathematics from the list specified

Core:

> 47 Credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in Mineral Processing workplace.

Electives :

A total of 57 credits to be obtained for this qualification must be selected from either one of the following streams: Gold, Platinum, base metal or mineral sands.

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to control a Mineral Processing plant and an ability to meet safety, health and environmental specifications.
3. Transfer and handle material in a Mineral Processing plant

4. Maintain equipment in a Mineral Processing plant
5. Separate materials in a Mineral Processing plant

Critical cross-field outcomes

This qualification addresses the following critical cross-field outcomes. The way in which the critical cross-field outcomes are addressed is presented in detail in the unit standards outlined in the Annexures

> Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made. Relates to all exit level outcomes
> Working effectively with others as a member of a team, group, organization and community. Relates to exit level outcomes 1, 3, 4 and 5.
> Organising and managing oneself and one's activities responsibly and effectively. Relates to exit level outcomes 1, 3, 4 and 5
> Collecting, analyzing, organizing and critically evaluating information. Relates to exit level outcomes 1, 3, 4 and 5.
> Communicating effectively using visual, mathematical and/or language skills. Relates to exit level outcomes 1.
> Using science and technology effectively and critically, showing responsibility toward the environment and health of others. Relates to exit level outcomes 1, 3, 4 and 5.
> Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation. Relates to exit level outcomes 1.
Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:
> Reflecting on and exploring a variety of strategies to learn more effectively. Relates to all exit level outcomes.
> Participating as responsible citizens in the life of local, national and global communities. Relates to all exit level outcomes.
> Being culturally and aesthetically sensitive across a range of contexts. Relates to all exit level outcomes.
> Exploring education and career opportunities. Relates to all exit level outcomes.
> Developing entrepreneurial opportunities. Relates to all exit level outcomes.

ASSOCIATED ASSESSMENT CRITERIA

1.
> Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2.
> The process is monitored and controlled according to Mineral Processing specifications.
> A clean and safe work environment is maintained
> Problems relating to the Mineral Processing activities are solved using sector acceptable processes and procedures.

3.
> Liquids are transferred and handled in a Mineral Processing plant according to Mineral Processing specifications
> Waste material is handled in a Mineral Processing plant according to Mineral Processing specifications
> Problems relating to the transfer and handling of materials in a Mineral Processing plant are solved using sector acceptable processes and procedures

4.
> Equipment is maintained according to Mineral Processing specifications
> A clean and safe work environment is maintained
> Problems relating to the maintenance of equipment are solved using sector acceptable procedures.

5.
> Materials are separated according to Mineral Processing specifications
> Problems relating to the separation of materials in a Mineral Processing plant are solved using sector acceptable procedures

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

International Comparability

National qualification sites on the Internet were explored in order to find qualifications related to Mineral Processing.
> Australia: National Training Information Services (www.ntis.gov.au)
> MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz)
> Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)
It was clearly evident that those found were not suitable since no Mineral Processing is mentioned.
In New Zealand only Gold and Alluvial Gold qualifications could be found. These qualifications have very little in common with Mineral Processing

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral processing/Metallurgy NQF Level 3). The fundamental unit standards should give the learner access to any qualification at NQF level 3, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:
> To be registered as an assessor with the relevant ETQA
> The assessor must have completed a similar qualification or from the same family of qualifications, at or above the level of the qualifications.

Assessors should keep the following general principles in mind when designing and conducting assessments:
> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
> All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:

> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The

judgement made is similar to the judgement that would be made by other assessors.

NOTES

Summary of credit composition

Fundamental - Core - Elective - Total
> Level 1-0-2-0-2
> Level 2-36-39-57-132
> Level 3--6--6
Total-36-47-57-140

Motivation for allocation of credits
Due to the different process options employed in the Mineral Processing plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

A minimum of 140 credits is required to complete the qualification.

Motivation for the Level of the Qualification

More than 72 credits towards unit standards included in this qualification are on level 2

Range statements:
The unit standards provide the details of the ranges within which candidates are required to perform

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	9823 Perform basic life support and/or first aid procedures in emergencies	Level 1	5	Registered
Core	13167 Identify potential hazards and critical safety issues in the workplace	Level 1	2	Registered
Core	14656 Demonstrate an understanding of sexuality and sexually transmitted infections including HIV/AIDS	Level 1	5	Registered
Core	9022 Transfer a fluid by means of a centrifugal pump	Level 2	3	Registered
Core	9024 Separate liquid from solids by means of a thickener	Level 2	3	Registered
Core	9573 Maintain a cyclone	Level 2	2	Registered
Core	9964 Apply health and safety to a work area	Level 2	3	Reregistered
Core	10571 Separate material by means of a cyclone	Level 2	4	Registered
Core	10576 Separate material by means of a vibrating screen	Level 2	4	Registered
Core	11650 Control the water reticulation in a metallurgical process	Level 2	4	Registered
Core	11655 Determine relative density by means of a density scale	Level 2	3	Registered
Core	11664 Control feed rate by means of a feeder	Level 2	2	Registered
Core	114104 Handle production waste	Level 2	3	Registered
Core	9574 Maintain belt conveyor components	Level 3	6	Registered
Elective	9565 Control feed distribution by means of a mobile system	Level 2	2	Registered
Elective	9566 Seperate liquid form solids by means of a filter press	Level 2	6	Registered
Elective	10535 Separate material by means of a hydrosizer	Level 2	4	Registered
Elective	10577 Separate liquid from solids by means of a vacuum drum filter	Level 2	6	Registered
Elective	10578 Separate liquid from solids by means of a belt filter	Level 2	6	Registered
Elective	10580 Separate liquid from solids by means of a pressurised drum filter	Level 2	6	Registered
Elective	10581 Separate liquid from solids by means of a high-rate thickener	Level 2	3	Registered
Elective	11062 Off-load xanthate from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	11063 Off-load ammonia from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	11064 Off-load pulp from a tanker into a storage facility	Level 2	2	Registered
Elective	11065 Load carbon from a storage facility into a road tanker	Level 2	6	Registered
Elective	11086 Load sulphuric acid from a bulk storage facility into a tanker	Level 2	4	Registered

Elective	11090 Handle liquid cyanide safely in a metallurgical plant	Level 2	4	Registered
Elective	11094 Handle cyanide solids safely in a metallurgical plant	Level 2	4	Registered
Elective	11095 Handle caustic soda safely in a metallurgical plant	Level 2	4	Registered
Elective	11096 Handle sulphuric acid safely in a metallurgical plant	Level 2	4	Registered
Elective	11097 Handle hydrochloric acid safely in a metallurgical plant	Level 2	4	Registered
Elective	11098 Handle nitric acid safely in a metallurgical plant	Level 2	4	Registered
Elective	11099 Handle lime safely in a metallurgical plant	Level 2	4	Registered
Elective	11100 Handle lead nitrate safely in a metallurgical plant	Level 2	4	Registered
Elective	11101 Handle xanthate safely in a metallurgical plant	Level 2	4	Registered
Elective	11102 Handle organic reagents safely in a metallurgical plant	Level 2	4	Registered
Elective	11103 Handle bulk oxygen safely in a metallurgical plant	Level 2	4	Registered
Elective	11106 Handle flocculant safely in a metallurgical plant	Level 2	4	Registered
Elective	11109 Off-load sulphuric acid from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	11110 Dispatch metallurgical process by-products	Level 2	4	Registered
Elective	11645 Replace medium in a fluidised bed roaster	Level 2	3	Registered
Elective	11646 Regenerate organic solvent	Level 2	4	Registered
Elective	11653 Separate liquid from solids by means of a centrifuge	Level 2	2	Registered
Elective	11654 Remove airborne dust by means of a scrubber	Level 2	3	Registered
Elective	11657 Generate compressed air	Level 2	3	Registered
Elective	11662 Transfer fluid by means of a positive displacement pump	Level 2	2	Registered
Elective	11777 Off-load a petroleum product from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	12172 Remove airborne dust by means of a bag filter	Level 2	3	Registered
Elective	15286 Make-up a caustic soda solution in a metallurgical plant	Level 2	4	Registered
Elective	15287 Make-up an ammonium chloride solution in a metallurgical plant	Level 2	4	Registered
Elective	15290 Reclaim material from a tailings dam by means of high pressure monitoring	Level 2	3	Registered
Elective	15296 Deposit waste rock onto a waste dump by means of a belt conveyor system	Level 2	3	Registered
Elective	15297 Make-up an ammonium sulphate solution in a metallurgical plant	Level 2	4	Registered
Elective	15298 Make-up a hydrochloric acid solution in a metallurgical plant	Level 2	4	Registered
Elective	15300 Make-up ammonia solution in a metallurgical plant	Level 2	4	Registered
Elective	15301 Make-up a sodium bromate solution in a metallurgical plant	Level 2	4	Registered
Elective	15306 Make-up a sodium chlorate solution in a metallurgical plant	Level 2	4	Registered
Elective	15307 Slake lime	Level 2	4	Registered
Elective	15316 Make-up a sodium thiosulphate solution in a metallurgical plant	Level 2	4	Registered
Elective	15323 Make-up a flocculent solution in a metallurgical plant	Level 2	4	Registered
Elective	110114 Re-cloth a belt filter	Level 2	7	Registered
Elective	110117 Remove ferromagnetic material from a belt conveyor by means of an over belt magnet	Level 2	2	Registered
Elective	110155 Re-cloth a drum filter	Level 2	7	Registered
Elective	110160 Re-cloth a filter press	Level 2	7	Registered
Elective	110171 Maintain steel ball load in a mill by means of a suspended magnetic loading system	Level 2	3	Registered
Elective	110184 Separate liquid from solids by means of a pan-filter	Level 2	6	Registered
Elective	110195 Separate material by means of a centrifugal gravity concentration process	Level 2	5	Registered
Elective	110208 Produce briquettes from fine material	Level 2	5	Registered
Elective	110379 Separate material by means of a linear screen	Level 2	3	Registered
Elective	110407 Dispatch base metals	Level 2	4	Registered
Elective	110450 Replace stellar filter candles	Level 2	4	Registered
Elective	110454 Replace merrill filter bags	Level 2	4	Registered
Elective	115592 De-water material by means of a de-watering screen	Level 2	2	Registered
Elective	115616 Recover uranium from solution by means of chemical precipitation	Level 2	7	Registered
Elective	10537 Leach metal bearing material by means of heap leaching	Level 3	5	Registered
Elective	10538 Adsorb dissolved gold onto activated carbon	Level 3	5	Registered

Elective	10545 Adsorb a dissolved precious metal onto resin	Level 3	7	Registered
Elective	10546 Elute a precious metal from loaded resin	Level 3	7	Registered
Elective	10547 Leach gold-bearing material by means of chlorine	Level 3	9	Registered
Elective	11061 Separate material by means of conventional cell froth flotation	Level 3	10	Registered
Elective	11067 Extract a specific platinum group metal from a solution by means of a chemical process	Level 3	10	Registered
Elective	11661 Separate material by means of column froth flotation	Level 3	10	Registered
Elective	11663 Separate material by means of a wet high intensity magnetic separator (WHIMS)	Level 3	5	Registered
Elective	15294 Leach gold from a gravity concentrate by means of an inline leach reactor	Level 3	7	Registered
Elective	15302 Make-up a cyanide solution in a metallurgical plant	Level 3	6	Registered
Elective	15305 Dry material by means of a thermal process	Level 3	7	Registered
Elective	110418 Separate material by means of an electrostatic separator	Level 3	3	Registered
Elective	110424 Separate material by means of a dry high intensity magnetic separator	Level 3	3	Registered
Elective	11078 Control a milling and classification operation in a metallurgical plant	Level 4	17	Registered
Elective	15293 Oversee a crushing and screening operation in a metallurgical plant	Level 4	24	Registered
Elective	15313 Control a drying operation in a metallurgical plant	Level 4	13	Registered
Elective	15315 Control a sulphuric acid operation in a metallurgical plant	Level 4	13	Registered
Fundamental	7469 Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2	Registered
Fundamental	7479 Describe, represent and informally analyse shape and motion in 2- and 3-dimensional space	Level 2	4	Reregistered
Fundamental	7480 Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3	Registered
Fundamental	8962 Maintain and adapt oral communication	Level 2	5	Registered
Fundamental	8963 Access and use information from texts	Level 2	5	Registered
Fundamental	8964 Write for a defined context	Level 2	5	Registered
Fundamental	8967 Use language and communication in occupational learning programmes	Level 2	5	Registered
Fundamental	9009 Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	4	Registered
Fundamental	12444 Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Mineral Processing, Gold Extraction

SAQA QUAL ID	*QUALIFICATION TITLE*	
49044	National Certificate: Mineral Processing, Gold Extraction	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-3-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
124	Level 3	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a gold extraction plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of a Gold Extraction plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a Gold Extraction plant.

It is intended that qualifying learners are able to:

> Communicate effectively in the workplace and a variety of other contexts
> Communicate effectively in the workplace and a variety of other contexts in a second language.
> Apply mathematical principles in practical applications
> Sustain Health and Safety in the workplace.
> Control gold extraction processes
> Maintain equipment

Rationale

Gold Extraction focuses on milling, leaching with cyanide, extraction or precipitation and pyro-metallurgical recovery and/or refining of the gold.

This is the second qualification in a learning pathway designed for learners in the mining and minerals sector who want to follow a career in Gold Extraction in the areas of crushing, milling, leaching with cyanide, extraction or precipitation and pyro-metallurgical recovery and/or refining of the gold. The learning pathway commences with the National Certificate in Mineral Processing: NQF level 2 and progresses to NQF level 4 for candidates learning and working in a Gold Extraction plant. The qualification reflects the skills, knowledge and understanding required to function effectively within a Gold Extraction plant/metallurgical plant.

Gold Extraction operations require a sound knowledge of process control of crushing, milling, leaching, precipitation or extraction and smelting. The mining sector put emphasis on safety and a healthy working environment within the Gold Extraction plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and potential supervisory ability.

This qualification will enhance the status, productivity and employability of the learner within the Mining and Minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related fabrication and extraction field.

The National Certificate in Gold Extraction (L3) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.
The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 4 in Mineral processing or Metallurgy.

The National Certificate in Gold Extraction: NQF Level 3 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification are already competent in the following areas:
> SAQA level 2 national certificate in mineral processing (gold extraction) or equivalent qualification.

Recognition of Prior Learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 12 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Rules of Combination

Fundamental

> 20 Communications credits from the list specified
> 16 Mathematics credits from the list specified

Core

> 35 credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in the Gold Extraction Plant.

Elective

A total of 53 credits (minimum) to be obtained for this qualification from the list specified in annexure C, which must include those for competencies, required at the applicable workplace, not yet represented in the core.

Summary of credit composition

Fundamental - Core - Elective - Total
Level 3 - 36 - 35 - 53 - 124

Motivation for allocation of credits

> Due to the different process options employed in the Gold Extraction plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

> A minimum of credits are required to complete the qualification.

Motivation for the Level of the Qualification

> More than 72 credits towards unit standards included in this qualification are at level 3

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to control a Gold Extraction process and an ability to meet safety, health and environmental specifications
3. Demonstrate an understanding of how to oversee a thickening process in a gold extraction plant.
4. Leach gold in a Gold Extraction process
5. Maintain belt conveyor components.

Critical cross field outcomes

This qualification addresses the following critical cross-field outcomes. The way in which the critical cross-field outcomes are addressed is presented in detail in the unit standards outlined in the Annexures.

Consistency of exit level outcomes with critical crossfield outcomes

1. Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made.
Relates to all Exit level outcomes

2. Working effectively with others as a member of a team, group, organization and community.
Relates to the following Exit level outcomes:
> Communicate and solve problems in a variety of ways
> Demonstrate an understanding of how to oversee a thickening process in a gold extraction plant
> Maintain belt conveyor components

3. Organising and managing oneself and one's activities responsibly and effectively
Relates to all Exit level outcomes

4. Collecting, analyzing, organizing and critically evaluating information.
Relates to all Exit level outcomes

5. Communicating effectively using visual, mathematical and/or language skills
Relates to all Exit level outcomes

6. Using science and technology effectively and critically, showing responsibility toward the environment and health of others
Relates to all Exit level outcomes

7. Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation
Relates to the following Exit level outcomes:
> Communicate and solve problems in a variety of ways

8. Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:□
> Reflecting on and exploring a variety of strategies to learn more effectively
Relates to all Exit level outcomes
> Participating as responsible citizens in the life of local, national and global communities
Relates to all Exit level outcomes
> Being culturally and aesthetically sensitive across a range of contexts
Relates to all Exit level outcomes
> Exploring education and career opportunities

Relates to all Exit level outcomes
> Developing entrepreneurial opportunities
Relates to all Exit level outcomes

Learning programmes directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:
> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life of local, national and global communities
> Being culturally and aesthetically sensitive across a range of social contexts
> Exploring education and career opportunities; and developing entrepreneurial opportunities

ASSOCIATED ASSESSMENT CRITERIA

1. > Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2. > The process is monitored and controlled according to Gold Extraction specifications
> A clean and safe work environment is maintained
> Problems relating to the Gold Extraction process are solved using sector acceptable procedures

3. > The process is monitored and controlled according to Gold Extraction specifications
> A clean and safe work environment is maintained
> Problems relating to the Gold Extraction process are solved using sector acceptable procedures

4. > Gold is leached according to Gold Extraction specifications
> Problems relating to the leaching process are solved using sector acceptable procedures

5. > Conveyor components are maintained according to specified requirements.
> Problems relating to belt conveyor maintenance are solved using sector acceptable procedures

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

National Qualification sites on the Internet were explored in order to find qualifications related to Gold Extraction.

> Australia: National Training Information Services (www.ntis.gov.au) MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz) Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

In New Zealand separate Gold and Alluvial Gold qualifications were found.

This proposed Gold Extraction qualification is much more generic since it incorporates all gold recovery processes.

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral Processing/Metallurgy NQF Level 4). The fundamental unit standards should give the learner access to any qualification at NQF level 4, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:
> To be registered as an assessor with the relevant ETQA.

The assessor must have completed:
> A similar qualification or from the same family of qualifications, at or above the level of the qualification.

Assessors should keep the following general principles in mind when designing and conducting assessments:

1. Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
2. Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.

All assessments should be conducted in line with the following well documented principles of assessment as defined below:
Principles of assessment:
> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range Statements
□
The unit standards provide the details of the ranges within which candidates are required to perform

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
Core	12483 Perform basic first aid	Level 2	4	Reregistered
Core	9574 Maintain belt conveyor components	Level 3	6	Registered
Core	10536 Leach metal bearing material in a pressure vessel	Level 3	6	Registered
Core	14798 Respond to hazardous conditions or emergencies	Level 3	10	Registered
Core	114951 Describe how to manage substance abuse and addiction in the workplace	Level 3	2	Registered
Core	14986 Demonstrate knowledge and understanding of fire exposures in order to manage the potential fire risk	Level 4	3	Registered
Core	14993 Demonstrate knowledge and understanding of the Mines Health and Safety Act, (Act 29 of 1996) and its application	Level 4	4	Registered
Elective	9562 Crush material by means of an impact-type crusher	Level 3	5	Registered
Elective	9570 Reline a mill	Level 3	12	Registered
Elective	9575 Replace conveyor belting	Level 3	6	Registered
Elective	9586 Extract a metal from a solution by means of solvent extraction	Level 3	5	Registered

Elective	9587 Produce bullion by means of a furnace	Level 3	5	Registered
Elective	10537 Leach metal bearing material by means of heap leaching	Level 3	5	Registered
Elective	10538 Adsorb dissolved gold onto activated carbon	Level 3	5	Registered
Elective	10547 Leach gold-bearing material by means of chlorine	Level 3	9	Registered
Elective	11061 Separate material by means of conventional cell froth flotation	Level 3	10	Registered
Elective	15294 Leach gold from a gravity concentrate by means of an inline leach reactor	Level 3	7	Registered
Elective	15302 Make-up a cyanide solution in a metallurgical plant	Level 3	6	Registered
Elective	110443 De-aerate a solution by means of Crowe tower	Level 3	12	Registered
Elective	110445 Reline a mill by means of a hydraulic relining machine	Level 3	8	Registered
Fundamental	7456 Use mathematics to investigate and monitor the financial aspects of personal, business and national issues	Level 3	2	Registered
Fundamental	7458 Find the derivatives of a range of simple functions and apply these to problems involving tangents to curves and rates of change	Level 3	2	Reregistered
Fundamental	7460 Use structured models to describe, represent and analyse shape and motion in 2- and 3-dimensional space	Level 3	4	Registered
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Registered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Registered
Fundamental	8970 Write texts for a range of communicative contexts	Level 3	5	Registered
Fundamental	8971 Analyse and respond to a variety of literary texts	Level 3	5	Registered
Fundamental	9012 Investigate life and work related problems using data and probabilities	Level 3	5	Registered
Fundamental	14086 Work with a wide range of patterns and basic functions and solve related problems	Level 3	3	Registered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

National Certificate: Platinum Metals Refining

SAQA QUAL ID	*QUALIFICATION TITLE*	
49047	National Certificate: Platinum Metals Refining	
SGB NAME	SGB Mining and Minerals	
ABET BAND	*PROVIDER NAME*	
Undefined		
QUALIFICATION CODE	*QUAL TYPE*	*SUBFIELD*
MET-2-National Certificate	National Certificate	Fabrication and Extraction
MINIMUM CREDITS	*NQF LEVEL*	*QUALIFICATION CLASS*
160	Level 2	Regular-Unit Stds Based
SAQA DECISION NUMBER	*REGISTRATION START DATE*	*REGISTRATION END DATE*

PURPOSE OF THE QUALIFICATION

This qualification is aimed at persons who work or intend to work within a Platinum Metals Refining plant and who seek recognition for essential skills in this area.

The key skills, knowledge and understanding reflected in this qualification are that of conducting the essential operations associated with efficient and safe operation of the platinum metals refining metallurgical plant. This qualification is designed to be flexible and accessible and empowers the learner to acquire and demonstrate knowledge, skills, attitudes and values required to work safely and effectively in a platinum metals refining plant.

It is intended that qualifying learners are able to:

> Communicate effectively in the workplace and a variety of other contexts
> Communicate effectively in the workplace and a variety of other contexts in a second language
> Apply mathematical principles in practical applications
> Sustain occupational health and safety in the workplace
> Conduct materials handling activities in a platinum refinery
> Control metals refining processes in a platinum refinery
> Dissolve metals (platinum group metals stream)
> Separate metals (platinum group metals stream)
> Blend metals (platinum group metals stream)
> Conduct Process control activities (Base Metals Stream)
> Dissolve metals (Base Metals Stream)
> Handle hazardous substances (Base Metals Stream)

Rationale for the qualification:

Platinum metals refining focuses on precious metals and base metals refining processes.

This is the first qualification in a learning pathway designed for learners in the mining and minerals sector who want to follow a career in Platinum Metals Refining in the areas of precious metals and base metals refining. The qualification reflects the skills, knowledge and understanding required to function effectively within a Platinum Metals refining plant/metallurgical plant.

Platinum Metals Refining operations require a sound knowledge of materials transporting and handling and process control in both precious metals and base metals refining operations. The mining sector put emphasis on safety and healthy working environment within Platinum metals refining plant/metallurgical plant. Workers are appointed based on their technical knowledge, experience and operational skills.

This qualification will enhance the status, productivity and employability of the learner within the mining and

minerals industry as well as contribute to the quality, production rate and growth. This allows for access, progression, portability and mobility within and between the different Mineral processing areas in the Mining and Minerals industry.

In the Mining and Minerals sector, employees are appointed on technical knowledge (operations), experience and potential supervisory ability. It is therefore assumed that learners attempting this qualification are competent in numeric and communication skills and/or technically competent on a specific aspect of metallurgical operations or related refining field.

The National Certificate in Platinum Metals Refining (L2) is designed to meet the needs of learners in the Mining and Minerals sector (or those who wish to enter the Mining and Minerals sector) who require technical expertise and essential knowledge needed to earn a formal qualification in mineral operations. The qualification facilitates access from previously disadvantaged groups and other learners to acquire the technical knowledge and skills that are required.

The qualification adds value to a learner, enriches the learner by giving the learner status, recognition, licensing and improves their marketability and employability. The qualification opens access to additional learning at NQF level 3 in Mineral processing or Metallurgy.

The National Certificate in Platinum Metals Refining NQF Level 2 provides benefit to society and economy through enhanced citizenship, increasing social and economic productivity, providing specifically skilled people and transforming and redressing the legacies of inequity.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that candidates embarking on learning towards this qualification have already achieved the qualfication:
> Introduction to Mining and Mineral Sector Certificate

Recognition of prior learning

This qualification can be achieved wholly or in part through recognition of prior learning in terms of the criteria laid out in item 12 above.

Evidence can be presented in a variety of forms, including international or previous local qualifications, reports, testimonials mentioning functions performed, work records, portfolios, videos of practice and performance records.

All such evidence should be judged according to the general principles of assessment described in the note to assessors.

QUALIFICATION RULES

Fundamentals:

> 20 Communications credits from the list specified
> 16 Mathematics from the list specified

Core:

> 49 Credits from the list specified
The unit standards in the core cover the main generic skills and knowledge required by people working in a Platinum Metals Refining workplace.

Electives:
A total of 75 credits to be obtained for this qualification must be selected from either one of the following streams: Platinum group metals refining, or Base metals refining.

Summary of credit composition

Fundamentals - Core - Elective - Total
> Level 1--2--2
> Level 2-36-24-50-110

> Level 3--3-27-30
> Level 4--20--20
Total-36-49-77-149

Motivation for allocation of credits

Due to the different process options employed in the Platinum Metals Refining plants, it is not possible to include the credits towards such processes in the common core and provision is therefore made in the electives for these.

A minimum of 160 credits is required to complete the qualification.

Motivation for the Level of the Qualification

Mote than 72 credits towards unit standards included in this qualification are at level 2

EXIT LEVEL OUTCOMES

1. Communicate and solve problems in a variety of ways
2. Demonstrate an understanding of how to control a Platinum Metals Refining process and an ability to meet safety, health and environmental specifications.□
3. Transfer and handle material in a Platinum Metals Refinery
4. Demonstrate an understanding of how to dissolve metals in a platinum metals refining process
5. Separate metals in a Platinum Metals Refinery
6. Blend material in a Platinum Metals Refinery
7. Handle hazardous substances in a Platinum Metals Refinery

Critical cross-field outcomes

This qualification addresses the following critical cross-field outcomes. The way in which the critical cross-field outcomes are addressed is presented in detail in the unit standards outlined in the Annexures.

Consistency of exit level outcomes with critical crossfield outcomes

> Identifying and solving problems in which responses display that responsible decisions using critical thinking have been made. Equivalent to all exit level outcomes
> Working effectively with others as a member of a team, group, organization and community. Equivalent to exit level outcomes 1 and 2.
> Organising and managing oneself and one's activities responsibly and effectively. Equivalent to exit level outcomes 1 and 2.
> Collecting, analyzing, organizing and critically evaluating information. Equivalent to exit level outcomes 1, 2, 3, 4, 5, and 6.
> Communicating effectively using visual, mathematical and/or language skills. Equivalent to exit level outcome 1.
> Using science and technology effectively and critically, showing responsibility toward the environment and health of others. Equivalent to all exit level outcomes
> Demonstrating an understanding of the world as a set of related systems by recognizing that problem contexts do not exist in isolation. Equivalent to exit level outcome 1.
> Contributing to the full personal development of each learner and the social and economic development of society at large, by making it an underlying intention of the programme of learning to make an individual aware of:
Reflecting on and exploring a variety of strategies to learn more effectively. Equivalent to all exit level outcomes
Participating as responsible citizens in the life of local, national and global communities. Equivalent to all exit level outcomes
Being culturally and aesthetically sensitive across a range of contexts. Equivalent to all exit level outcomes
Exploring education and career opportunities. Equivalent to all exit level outcomes
Developing entrepreneurial opportunities. Equivalent to all exit level outcomes

Learning programs directed towards this qualification will also contribute to the full personal development of each learner and the social and economic development of the society at large, by making individuals aware of the importance of:
> Reflecting on and exploring a variety of strategies to learn more effectively
> Participating as responsible citizens in the life and local, national and global communities
> Being culturally and aesthetically sensitive across a range of social context

> Exploring education and career opportunities and developing entrepreneurial opportunities.

ASSOCIATED ASSESSMENT CRITERIA

1.
> Oral and written communication is successfully engaged in a business environment
> Problems are understood and solved to indicate critical and creative thinking
> Business principles are understood and applied as they apply to a business environment

2.
> The process is monitored and controlled according to Platinum Metals Refining specifications.
> A clean and safe work environment is maintained
> Problems relating to the Platinum Metals Refining process are solved using sector acceptable processes and procedures.

3.
> Liquids are transferred and handled in a platinum metals refinery according to Platinum Metals Refinery specifications
> Waste material is handled in a platinum metals refinery according to Platinum Metals Refinery specifications
> Problems relating to the transfer and handling of materials in a Platinum Metals Refining Process are solved using sector acceptable processes and procedures

4.
> Metals are dissolved according to platinum metals refining specifications
> Problems relating to dissolution of metals in a Platinum Metals Refining Process are solved using sector acceptable processes and procedures

5.
> Metals are separated according to platinum metals refining specifications
> Problems relating to the separation of metals in a Platinum Metals Refining Process are solved using sector

6.
> Materials are blended according to platinum metals refining specifications
> Problems relating to the blending of material in a Platinum Metals Refining Process are solved using sector

7.
> Hazardous substances are handled according to platinum metals refining specifications
> Problems relating to the handling of hazardous substances in a Platinum Metals Refining Process are solved using sector

Integrated Assessment

Integrated assessment provides a requirement for learners to display an ability to integrate practical performance, actions, concepts and theory across unit standards to achieve competence in relation to the purpose of this qualification. For award of the qualification, a candidate must achieve each unit standard as per item 12 above.

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Identifying and solving of problems, working in a team work, organising one-self, using applied science and implication of actions and reactions in the world as a set of related systems must be assessed during any combination of practical, foundational and reflexive competencies assessment methods and tools to determine the whole person development and integration of applied knowledge and skills.

Applicable assessment tool(s) to establish the foundational, reflexive and embedded knowledge to problem solving and application of the world as a set of related systems within the manufacturing and maintenance field.
A detailed portfolio of evidence is required to prove practical, applied and foundational competencies of the learner.
Assessors and moderators should develop and conduct their own integrated assessment by making use of a range of formative and summative assessment methods. Assessors should assess and give credit for the evidence of learning that has already been acquired through formal, informal and non-formal learning and

work experience.
Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

To qualify, a candidate must achieve the combination of unit standards defined for each exit level outcome as per the given rules of combination. The assessment criteria for each unit standard are defined within each unit standard. Integration of skills will be demonstrated through the achievement of the core decorating standards.

Assessment should be in accordance with the following general and specific principles:

The initial assessment activities should focus on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. Where assessment at title level is unmanageable, then the assessment can focus on each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.

Evidence must be gathered across the entire range specified in each unit standard, as applicable. Assessment activities should be as close to the real performance as possible, and where simulations or role-players are used, there should be supporting evidence to prove that the candidate is able to perform in the real situation.

All assessments should be conducted in accordance with the following universally accepted principles of assessment: use appropriate, fair manageable methods, that are integrated into real work or learning situations; judge evidence on the basis of its validity, currency, authenticity and sufficiency; ensure assessment processes are systematic, open and consistent.

INTERNATIONAL COMPARABILITY

International Comparability

National qualification sites on the Internet were explored in order to find qualifications related to Platinum Metals Refining.
> Australia: National Training Information Services (www.ntis.gov.au)
> MNM 20203 certificate II in metallurgical mining operations.
> New Zealand: The New Zealand Qualification Authority (www.nzqa.govt.nz)
> Extractive metallurgical processes Metalliferous gold
> Scotland: The Scottish Qualification Authority (www.sqa.org.uk)
> USA: The Quality Assurance System of Higher Education (www.cqaie.org.us)

It was clearly evident that those found were not suitable since no Platinum Metals Refining is mentioned. In New Zealand only Gold and Alluvial Gold qualifications could be found. These qualifications have very little in common with Platinum Metals Refining

ARTICULATION OPTIONS

The qualification allows for both horizontal (persons with qualifications at the same or higher levels can pursue this qualification for career orientation) and vertical (persons completing this qualification can proceed to a relevant National Certificate: Mineral processing/Metallurgy NQF Level 3). The fundamental unit standards should give the learner access to any qualification at NQF level 3, subject to entry requirements of the individual provider offering such learning.

MODERATION OPTIONS

Anyone assessing a learner or moderating the assessment of a learner against this qualification must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA.

Assessment and moderation of assessment will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.

Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

For an applicant to register as an assessor, the applicant needs:

To be registered as an assessor with the relevant ETQA..
The assessor must have completed:
> A similar qualification or from the same family of qualifications, at or above the level of the qualifications.

Assessors should keep the following general principles in mind when designing and conducting assessments:
> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the unit standards to ensure assessment is integrated rather than fragmented. The aim is to declare the person competent in terms of the qualification purpose. Where assessment at across titles or at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
> All assessments should be conducted in line with the following well documented principles of assessment as defined below:

Principles of assessment:

> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence. In particular, the method of assessment is sensitive to language diversity.
> Manageable: The methods used make for easily arranged, cost-effective assessments that do not unduly interfere with learning.
> Integrated into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the Standard; i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions of actual performance as closely as possible
> Authentic: The assessor is satisfied that the work being assessed is attributable to the person being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Assessment candidates understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar to the judgement that would be made by other assessors.

NOTES

Range statements

The unit standards provide the details of the ranges within which candidates are required to perform

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	*LEVEL*	*CREDITS*	*STATUS*
Core	9823 Perform basic life support and/or first aid procedures in emergencies	Level 1	5	Registered
Core	13167 Identify potential hazards and critical safety issues in the workplace	Level 1	2	Registered
Core	14656 Demonstrate an understanding of sexuality and sexually transmitted infections including HIV/AIDS	Level 1	5	Registered
Core	9022 Transfer a fluid by means of a centrifugal pump	Level 2	3	Registered

Core	9624 Take representative samples of slurries and liquids in a metallurgical process	Level 2	4	Registered
Core	9635 Take a representative sample of solid material in a metalurgical process	Level 2	4	Registered
Core	9964 Apply health and safety to a work area	Level 2	3	Reregistered
Core	11662 Transfer fluid by means of a positive displacement pump	Level 2	2	Registered
Core	114104 Handle production waste	Level 2	3	Registered
Core	9636 Determine the pH of a liquid by means of a pH meter	Level 3	2	Registered
Core	11105 Monitor and control a metallurgical plant from a control room	Level 4	20	Registered
Elective	9584 Concetrate metal bearing liqour by means of an evaporator	Level 1	2	Registered
Elective	9024 Separate liquid from solids by means of a thickener	Level 2	3	Registered
Elective	9565 Control feed distribution by means of a mobile system	Level 2	2	Registered
Elective	9566 Seperate liquid form solids by means of a filter press	Level 2	6	Registered
Elective	9573 Maintain a cyclone	Level 2	2	Registered
Elective	9579 Regenerate resin	Level 2	4	Registered
Elective	9585 Recover gold from solution by means of chemical precipitation	Level 2	4	Registered
Elective	9588 Calcine metal bearing concentrate	Level 2	2	Registered
Elective	9626 Perform measurements using volumetric equipment	Level 2	2	Registered
Elective	10571 Separate material by means of a cyclone	Level 2	4	Registered
Elective	10576 Separate material by means of a vibrating screen	Level 2	4	Registered
Elective	10577 Separate liquid from solids by means of a vacuum drum filter	Level 2	6	Registered
Elective	10578 Separate liquid from solids by means of a belt filter	Level 2	6	Registered
Elective	10580 Separate liquid from solids by means of a pressurised drum filter	Level 2	6	Registered
Elective	11062 Off-load xanthate from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	11063 Off-load ammonia from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	11095 Handle caustic soda safely in a metallurgical plant	Level 2	4	Registered
Elective	11096 Handle sulphuric acid safely in a metallurgical plant	Level 2	4	Registered
Elective	11103 Handle bulk oxygen safely in a metallurgical plant	Level 2	4	Registered
Elective	11650 Control the water reticulation in a metallurgical process	Level 2	4	Registered
Elective	11655 Determine relative density by means of a density scale	Level 2	3	Registered
Elective	11777 Off-load a petroleum product from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	110402 Separate liquid from solids by means of a vacuum tank filter	Level 2	4	Registered
Elective	110412 Control water quality in a cooling system	Level 2	6	Registered
Elective	115579 Off-load liquid oxygen from a tanker into a bulk storage facility	Level 2	4	Registered
Elective	9562 Crush material by means of an impact-type crusher	Level 3	5	Registered
Elective	9570 Reline a mill	Level 3	12	Registered
Elective	9574 Maintain belt conveyor components	Level 3	6	Registered
Elective	9575 Replace conveyor belting	Level 3	6	Registered
Elective	9576 Separate material by means of a dense medium cyclone	Level 3	6	Registered
Elective	9586 Extract a metal from a solution by means of solvent extraction	Level 3	5	Registered
Elective	9587 Produce bullion by means of a furnace	Level 3	5	Registered
Elective	10536 Leach metal bearing material in a pressure vessel	Level 3	6	Registered
Elective	11067 Extract a specific platinum group metal from a solution by means of a chemical process	Level 3	10	Registered
Elective	11069 Control medium density in a dense medium separation process	Level 3	6	Registered
Elective	11081 Dissolve precious metals in an acid medium	Level 3	5	Registered
Elective	115566 Blend platinum group metal liquors	Level 3	6	Registered
Elective	11078 Control a milling and classification operation in a metallurgical plant	Level 4	17	Registered
Fundamental	7469 Use mathematics to investigate and monitor the financial aspects of personal and community life	Level 2	2	Registered
Fundamental	7479 Describe, represent and informally analyse shape and motion in 2- and 3-dimensional space	Level 2	4	Reregistered
Fundamental	7480 Demonstrate understanding of rational and irrational numbers and number systems	Level 2	3	Registered
Fundamental	8962 Maintain and adapt oral communication	Level 2	5	Registered

Fundamental	8963 Access and use information from texts	Level 2	5	Registered
Fundamental	8964 Write for a defined context	Level 2	5	Registered
Fundamental	8967 Use language and communication in occupational learning programmes	Level 2	5	Registered
Fundamental	9009 Apply basic knowledge of statistics and probability to influence the use of data and procedures in order to investigate life related problems	Level 2	4	Registered
Fundamental	12444 Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts	Level 2	3	Registered