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**GOVERNMENT NOTICE**

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**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**

No. 986

19 October 2007

**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

**Environmental Science and Waste Management**

registered by Organising Field 10, Physical, Mathematical, Computer and Life Sciences, publishes the following Qualification and Unit Standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualification and Unit Standards. The full Qualification and Unit Standards can be accessed via the SAQA web-site at [www.saqqa.org.za](http://www.saqqa.org.za). Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualification and Unit Standards should reach SAQA at the address below and **no later than 19 November 2007**. All correspondence should be marked **Standards Setting – Environmental Science and Waste Management** and addressed to

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**SOUTH AFRICAN QUALIFICATIONS AUTHORITY**
**QUALIFICATION:**
**National Certificate: Environmental Noise Control**

SAQA QUAL ID	QUALIFICATION TITLE		
59325	National Certificate: Environmental Noise Control		
ORIGINATOR	PROVIDER		
SGB Environmental Sc/Mgt & Waste Mgt			
QUALIFICATION TYPE	FIELD	SUBFIELD	
National Certificate	10 - Physical, Mathematical, Computer and Life Sciences	Environmental Sciences	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	123	Level 5	Regular-Unit Stds Based

**PURPOSE AND RATIONALE OF THE QUALIFICATION**
**Purpose:**

This qualification equips Noise Control Officers (NCO) to deal with strategic issues around noise, as well as noise related concerns in town planning, where a 15 to 20 year perspective is essential, and the integration of various strategies important. This person will 'own' noise related policies, and take responsibility for the establishment of noise control zones, for endorsement by Council. The NCO also plays an advisory role; advising town planners, civil engineers, electrical engineers, and the Legal and Corporate Department with respect to noise and ways in which what they are doing impacts on environmental noise. The NCO also provides advice on the requirements for compliance with national standards and legislation.

Of particular concern is the development of new roads, where the NCO makes recommendations on surface, road placement in relation to residential areas and noise sensitive areas; new buildings, where advice includes positioning of equipment and noise mitigation. Advice to Town Planners ensures that proposed residential areas are appropriately developed, and that there is adequate focus on noise sensitive areas (SANS 100328), and protection of noise sensitive areas.

The NCO works with Acoustic Engineers, and will appoint them for specialist work which will include: the development of mitigation strategies and/or solutions to civil and other engineering controls. Acoustic Engineers, on the request of NCOs, specify noise control measures, design measures and recommends materials. The NCO takes responsibility for the recommended mitigation measures and their implementation. The NCO has an informed understanding of noise control, and can recommend measures, and interpret, verify and approve reports submitted by external experts. The NCO is familiar with terminology and concepts in the field, and is able to perform key calculations to verify measurements and findings with respect to propagation, modelling and/or prediction, and dispersion.

It is important to recognise that the legal mandate resides with the NCO who carries the legal responsibility.

There is a scarcity of skills in this area in the country as a whole, with a reliance on expert consultants. Appointed NCOs are required by current legislation to enforce noise control measures, but in many cases, they lack the expertise to evaluate the quality of the reports they receive, and make judgements in this regard. There is a huge case load at present, with many investigations required, and too few people qualified to process them. This qualification will

complement the existing professional expertise, and allow for greater focus and efficiency in the field.

The qualification will also provide for a variety of learning pathways - some Environmental Health Practitioners (appointed as NCOs) will be able to achieve this qualification as part of their tertiary study, delivered by institutions. Some will be able to have their practical skills, developed on the job, recognised through an RPL (Recognition of Prior Learning) process.

In particular, this qualification will be useful for:

- Environmental Health Practitioners working in municipalities.
- Noise control officers.
- Other professionals: Members of professional associations wishing to work in noise control.
- Persons in local authorities wishing to broaden their knowledge and experience in noise control.

Recipients of this qualification will be able to:

- Use mathematics to work with functions; shape and motion; and statistics and probability.
- Demonstrate knowledge of the physics of sound.
- Manage the impact of noise on communities.
- Implement noise management and control measures.

Noise Control Officers are senior managers who carry out their roles:

- In response to legal requirements.
- With independence in decision-making (able to advise the tribunal on noise issues).
- As head of a specialist unit responsible for measuring, and reporting.

Rationale:

Currently Environmental Health Practitioners do not receive adequate training in noise management as part of their initial training in environmental health. Degree programmes have traditionally not looked at noise. With rapid urbanization, noise is becoming an issue, and municipalities are faced with a growing challenge in this regard, as they are required to enforce noise related legislation. A significant part of the challenge is the lack of suitably qualified people.

Noise pollution is about the effect of noise on human beings. People in Local Authorities who work in the Noise Control Division of Integrated Pollution Control Departments are involved in the well-being of people and the internal and external environment. There are three main work roles in Noise Pollution and Assessment within Local Government:

- Field Workers (Assistant Environmental Health Practitioners): Catered for by unit standards within the National Certificate in Environmental Noise at NQF Level 4.
- Environmental Health Practitioners: Catered for by the National Certificate in Environmental Noise at NQF Level 4. These skills would be added on to the Environmental Health Practitioner qualification which should already be in place, and qualify practitioners as Noise Officers. The qualification is a stepping stone to the NQF Level 5 qualification which is a requirement for appointment as a Noise Control Officer.
- Noise Control Officers (NCO): The focus of this qualification. The NCO manages noise control holistically. It is a legal requirement that there be a NCO appointed for a local authority. The appointed person requires special training and certification for competence in Noise Management (clearly spelled out in the latest legislation).

Field workers (Assistant Environmental Health Practitioners NQF Level 3):

There is a need for officers at the level of field workers within the local authority to assist in the handling of noise nuisances within the communities and to report to the noise officers.

They apply the by-laws and facilitate issues between complainants and offenders where there is a noise nuisance. They are not involved in planning. They may issue an instruction for an investigation to be done by an expert. They need negotiation and conflict resolution skills, and good interpersonal skills. They work in response to complaints.

Environmental Health Practitioners (NQF Level 4):

Historically Environmental Health Practitioners require a diploma or degree for appointment by the Local Authority, without, or with minimal qualifications or recognized competence in noise management. They were required to follow instructions and report to Noise Control Officers.

The National Certificate: Environmental Noise (NQF Level 4) will provide the necessary knowledge and skill required by Noise Officers in Noise Control Divisions of Integrated Pollution Control Departments.

Noise Control Officers:

This NQF Level 5 National Certificate: Environmental Noise will build on the NQF Level 4 certificate. Noise Control Officers in management positions who hold the NQF Level 5 certificate also require a related tertiary qualification and registration with a professional council. They typically operate in Local Authorities as planners, supervisors and/or managers. Noise control is one of the core functions (KPA) for local government as defined in the new Health Act.

#### **RECOGNIZE PREVIOUS LEARNING?**

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#### **LEARNING ASSUMED IN PLACE**

It is assumed that learners are competent in:

- Communication at NQF Level 4.
- Mathematical Literacy at NQF Level 4.

Recognition of Prior Learning:

The Qualification may be obtained in whole or in part through the process of Recognition of Prior Learning. Learners who may meet the requirements of any Unit Standard in this Qualification may apply for recognition of prior learning to the Relevant ETQA, and will be assessed against the assessment criteria of the exit level outcomes of this qualification and specific outcomes for the relevant Unit Standard/s.

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

Access to the Qualification:

Access is open to all learners, but, it is preferable that they first obtain the FETC: Environmental Noise Practice before accessing this qualification.

#### **QUALIFICATION RULES**

- All unit standards in the Fundamental Component (12 credits) are compulsory.

- All unit standards in the Core Component (60 credits) are compulsory.
- Learners must choose unit standards totalling at least 51 credits from the Elective Component.
- Total credit value of the Qualification is 275.

### **EXIT LEVEL OUTCOMES**

1. Demonstrate knowledge of the physics of sound.
2. Manage the impact of noise on communities.
3. Implement noise management and control measures.

Critical Cross-Field Outcomes:

This qualification addresses the following critical cross-field outcomes, as detailed in the associated unit standards:

- Identifying and solving problems in which responses indicate that responsible decisions using critical and creative thinking have been made.
- Working effectively with others as a member of a team, group, organisation or community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual, mathematical and/or language skills in the modes of oral/written persuasion.
- Using science and technology effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrating and understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

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**

Associated Assessment Criteria for Exit Level Outcome 1:

- Sound is discussed in terms of the key characteristics of power, mechanical energy and force. The operation of sound generating equipment is explained in terms of these characteristics.
- Calculations of the speed of sound in different mediums are accurate. Reasons for the differences in speed are explained in accordance with generally accepted scientific understanding.

Associated Assessment Criteria for Exit Level Outcome 2:

- Noise is classified and described in terms of its impact on communities, and noise measurement reports verified in terms of regulations as they apply to these classifications.
- Processes and procedures for dealing with alleged noise infringement in a specific Local Authority are ensured to be compliant with national and provincial legislation, and appropriate to the needs at local level.

Associated Assessment Criteria for Exit Level Outcome 3:

- Input and/or guidance provided to local government departments with respect to noise, and noise-related planning requirements is consistent with international best practice, and appropriate in terms of challenges facing local communities.
- Principles of acoustics and acoustic screening, building design, transportation noise, and vibration control are applied to noise management decisions, to promote best practice from a planning and mitigation perspective.
- Guidance provided on legislation and regulations to Local Authorities is consistent with national and provincial strategic thinking on noise control, as well as international best practice.

#### Integrated Assessment:

Assessment should take place within the context of:

- Given Quality Assurance policies, procedures and processes.
- A guided and supported learning environment.

Assessment will take place according to the detailed specifications indicated in the unit standards above.

Over and above the achievement of the specified unit standards, evidence of integration will be required as per the broad criteria above, all within the context of an active learning environment.

Assessors should note that the evidence of integration (as above) could well be presented by candidates when being assessed against the unit standards, thus there should not necessarily be separate assessments for each unit standard and then further assessment for integration. Well designed assessments should make it possible to gain evidence against each unit standard while at the same time gain evidence of integration.

#### Assessment Principles:

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-plays 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 and manageable methods that are integrated into real work-related 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**

Qualifications from the following countries and/or bodies were sourced for a comparison with this qualification:

- World Health Organisation.
- International Associations:

- International Institute of Noise Control Engineering (I-INCE).
- Scotland.
- New Zealand.
- United States of America.
- INTER-NOISE Congresses.
  - United Kingdom.
  - Switzerland.
  - Australia.
  - Africa.

The following information indicates international involvement in and commitment to noise control and noise management:

The World Health Organisation:

The WHO provides the following guidelines on noise and noise management:

- Stages in Noise Management.
- Noise Exposure Mapping.
- Noise Exposure Modelling.
- Noise Control Approaches:
  - Mitigation measures (Road traffic noise, Railway noise and noise from trams, Aircraft noise, Machines and Equipment, Noise control within the sound transmission path, Noise protection at the receiver's site )
  - Precautionary measures (Land use planning, Education and public awareness).
- Evaluation of Control Options
- Management of Indoor Noise:
  - Government policy on indoor noise.
  - Design considerations.
  - Indoor noise level control.
  - Resolving indoor noise problems.
- Priority Setting in Noise Management:
  - Noise policy and legislation.
  - Examples of noise policies.
  - Noise emission standards have proven to be inadequate.
  - Unsustainable trends in noise pollution future policy planning.
  - Analysis of the impact of environmental noise.
  - Cost-benefit analysis.
  - Review of standard setting.
  - Enforcement of noise standards: Low-noise implementation plans.
- Conclusions on Noise Management.

International Associations:

The International Institute of Noise Control Engineering (I-INCE) was founded in 1974. It is a worldwide consortium of organizations concerned with noise control, acoustics and vibration. The primary focus of the Institute is on unwanted sounds and on vibrations producing such sounds when transduced. I-INCE is the sponsor of the INTER-NOISE Series of International Congresses on Noise Control Engineering held annually in leading cities of the world. I-INCE also co-sponsors symposia on specialized topics within the I-INCE field of interest. The quarterly magazine Noise/News International is jointly published by I-INCE and the Institute of Noise Control Engineering of the USA (INCE/USA). In 1992, I-INCE instituted a program to undertake technical initiatives on critically-important issues of international concern within the I-INCE field of interest. This initiative has resulted in three reports and six ongoing Technical Study Groups.



#### Draft Guidelines and Codes of Practice:

What is evident is that many nations are confronting the issue of noise and noise management. This is supported from the number of national guidelines being published, as well as codes of practice issued. The following are samples, and is not intended to be comprehensive.

#### Draft Scottish Noise Management Guide (October 24, 2005):

Chapter headings in the Guide include:

- Local authority noise management framework.
- Delivering the noise service.
- Public awareness and education initiatives.
- Review of noise service.

#### New Zealand: "Noise in the Workplace: Approved Code of Practice for the Management of":

The purpose of this code is to provide practical guidance in meeting the requirements of the Health and Safety in Employment Act 1992 and the Health and Safety in Employment Regulations 1995. This process involves the identification and the management of noise hazards in the workplace. A consequence of proper control and management of the problem of excessive noise will be a reduction in the incidence of hearing loss arising from noise exposure in workplaces.

Chapter headings in the Guide include:

- Part 2: Noise Hazard Identification.
- Part 3: Noise Hazard Assessment.
- Part 4: Control of Noise Hazards.
- Part 5: Protection Against Noise Hazards.
- Part 6: Training and Education.
- Part 7: Audiometry.
- Part 8: Designers, Manufacturers and Suppliers of Plant.
- Part 9: Designers, Manufacturers and Suppliers of Hearing Protectors.

#### United States of America:

Title: Examination of Noise Management Approaches in the United States:

Abstract: This report is intended to serve as a reference document on noise management approaches used in the United States. Emphasis has been placed on identifying and evaluating the full range of techniques and measures which are available when selecting a noise management strategy.

Broadening the range of choice is a first step in moving toward the resolution and prevention of noise/land use conflicts. Awareness of the available options is of critical importance when individual actors in an issue have limited unilateral power to achieve objectives.

The first three chapters of the report provide background material designed to aid in the understanding of noise management issues. A brief description of the noise problem in the U.S. is given, followed by a discussion on conceptual approaches to noise/land use issues. Some basic concepts of sound and the measurement and assessment of noise are reviewed. In addition, the management application of noise descriptors, relating human responses to noise exposure levels, is examined. In Chapter III, a change is made from describing the noise environment, to describe the legal framework of statutory and cause law that shapes

management policy. Chapters 4 through 6 are devoted to identifying and evaluating management approaches.

International conference on noise:

The INTER-NOISE Congresses are the largest international gathering of experts in noise control engineering each year. The INTER-NOISE Congresses have been held each year since 1972 at venues around the world. The Congresses include a large technical program consisting of papers and posters on all topics of noise control engineering. Papers summarizing these presentations are collected into a Proceedings document that is available for reference after the Congress. The Congresses also include an exhibition of the latest products and instrumentation for noise control engineering.

Countries have responded with their own legislation and guidelines for noise management. This in turn has led to education and training with respect to noise.

United Kingdom:

In 1974 the UK established The Institute of Acoustics as a professional body for those working in acoustics, noise and vibration. It amalgamated the Acoustics Group of the Institute of Physics and the British Acoustical Society. The Institute of Acoustics is a nominated body of the Engineering Council, offering registration at Chartered and Incorporated Engineer levels.

The range of interests of members within the world of acoustics embraces aerodynamics, architectural acoustics, building acoustics, electroacoustics, engineering dynamics, noise and vibration, hearing, speech, underwater acoustics, together with a variety of environmental aspects.

The Institute works closely with other professional bodies in related fields, including CIEH, REHIS and IOSH and the Association of Noise Consultants.

The Institute offers an education programme, comprising a postgraduate Diploma in Acoustics and Noise Control and several Certificate of Competence courses.

Through specialist Institute of Acoustics working groups, support is given to the development of legislation in these areas, and in UK, European and International Standards development. The Institute is a founding member of the European Acoustics Association (EAA), a member society of the International Institute of Noise Control Engineering (I-INCE) and a member of the International Commission for Acoustics (ICA):

Certificate of Competence in Environmental Noise Measurement:

A five-day course which provides delegates with a basic knowledge of the methodology of environmental noise measurement, including the use and accuracy requirements of sound level meters and analysers. It enables them to be aware of the significance of measurement data against the framework of standards and legislation for environmental noise.

Certificate of Competence in Workplace Noise Risk Assessment:

This Certificate course aims to provide a recognised course of education and training to enable persons to carry out workplace noise assessments in a competent manner, as required by the Control of Noise at Work Regulations 2005. It is designed to provide a background of basic acoustics combined with 'hands on' practical experience of industrial noise measurements and associated assessment of workplace noise exposure.

Diploma in Acoustics and Noise Control:

The Institute of Acoustics' postgraduate Diploma in Acoustics and Noise Control has been run since 1975. It is usually studied on a part-time basis, over one year. The Diploma course was set up to provide specialist academic training for membership of the Institute of Acoustics and over the years the course has become well established as providing high level training in real-world practical acoustics. As a result, the Diploma is widely recognised as the leading specialist qualification for the professional practitioner in acoustics. It is recognised by a number of UK universities as providing partial exemption from their requirements for the award of MSc degrees.

The normal minimum requirement for admission to the Diploma course is a degree in a science, engineering or construction-related subject or an Environmental Health Officer's Diploma.

The elements making up the programme (as trained by the universities) are:

- The General Principles of Acoustics Module.
- Two Specialist Option Modules.
- A Project.

These elements may be taken individually, e.g. over a period of two years, but to gain the Diploma, students must pass all of them.

The two Specialist Option Modules are chosen from:

- Architectural & Building Acoustics.
- Law & Administration.
- Noise Control Engineering.
- Transportation Noise.
- Sound Reproduction.
- Measurement & Instrumentation.
- Vibration Control.

Which options run depend upon the choices made by the students and the availability of suitable staff. However, the first four options are usually available.

MSc in Acoustics and Noise Control:

The MSc is designed to provide graduates with the knowledge and skills to work in environmental acoustics, whether in consultancy, local/central government or in research. The course also aims to provide employers with a supply of suitably qualified graduates.

The programme is designed to take graduates with an engineering or numerate science degree and give them specialist skills and knowledge in environmental acoustics. Acoustics is currently a skills shortage area, so good graduates will be in a very strong position in the jobs market. Students have the option to transfer between MSc Environmental Acoustics and MSc Audio Acoustics after completing the first four modules, which for full time students will be at the end of Semester 1.

The content focuses on Environmental Noise Measurement where candidates will learn how to take reliable measurements of environmental noise, how to apply acoustic theory and knowledge of standard practice to work out what, where and how to measure. They will be given a practical test with a sound level meter as part of the assessment, and will be given the opportunity to obtain the Institute of Acoustics Certificate of Competence in Environmental Noise Measurement. Details on content include:

Noise control:

- Knowledge to select appropriate noise control options for realistic environmental noise scenarios, and to justify their selections.

#### Mathematics and Vibrations:

- Competency at mathematics to understand how audio systems work.

#### Acoustics:

- Fundamental understanding of the physics behind the behaviour of sound - sound; vibration; sound generation and propagation; measurement (time and frequency).

#### Transducers and sound reinforcement:

- Design of appropriate transducers to transform electronic signals to acoustic waves; behaviour of these waves in rooms and outdoors; appropriate application of loudspeakers for music reproduction, sound reinforcement and public address.

#### Psychoacoustics:

- Human auditory perception: pitch perception, localisation and masking and how these are used in perceptual coding and spatial audio; measuring human response to audio signals.

#### Digital signal processing:

- Digital systems: transforming signals from analogue to digital representations and vice versa; manipulation of digital signals by filtering; exploration of convolution, Fourier transformation and filter design.

#### Numerical techniques:

- Use of numerical techniques to understand complex mathematical systems; techniques including Boundary Element, Finite Element, Statistical Energy Analysis and geometric room acoustic models.

#### Room Acoustics:

- Correct acoustical design to make the space comfortable to use and reproduced sound audible and intelligible; design of spaces for non-electronic sound sources.

#### NEBOSH qualifications.

The National Examination Board in Occupational Safety and Health is an independent awarding body attracting more than 20,000 candidates each year. NEBOSH was founded in 1979. Noise and noise management is treated as an aspect of Occupational Safety and Health.

The NEBOSH Specialist Diploma in Environmental Management is a professional level qualification designed to develop the environmental management skills of health, safety and environmental practitioners and other suitable candidates. Candidates are required to hold the IEMA Certificate in Environmental Management (or equivalent qualification) and would benefit from relevant Health and Safety qualifications and would ideally have environmental experience in industry. Upon completion of the course, candidates are assessed by written examination and will also need to submit an environmental audit report within an agreed time limit.

#### Topics Include:

- Understanding of techniques for monitoring air, water, waste and noise emissions.
- Understanding of environmental auditing in effective pollution control management.
- Detailed knowledge of air pollution control, effluent treatment and disposal of hazardous waste and environmental noise control.
- Selection of the best practicable environmental options using dispersion modelling.
- Environmental impact assessment.
- Risk assessment and cost benefit analysis.

The Open University (UK)-T308:

Environmental monitoring, modelling and control: This course is about strategies for controlling environmental pollution. By the end of the course learners are able to define and describe:

- The principles and concepts of solid wastes management, noise control, air quality management and water treatment.
- The computer modelling of environmental situations.
- The economic assessment of projects.

Noise, one of the course components, begins by reviewing basic concepts such as units, criteria and indices, legal and social control and planning. The technical aspects of noise control including prediction schemes and sound insulation of buildings are important topics. There are case studies of public enquiries and of industrial noise.

T308 is a Level 3 course, which makes intellectual demands appropriate to the final year of an honours degree. T308 is a compulsory course in the:

- Diploma in Pollution Control.

T308 is a specified course in the:

- BA (Hons) or BSc (Hons) Environmental Studies.
- BSc (Hons) Technology.
- BSc (Hons) Natural Sciences.
- Advanced Diploma in Environmental Decision-Making.

Switzerland:

Swiss Acoustical Society: Schweizerische Gesellschaft für Akustik/Société Suisse d'Acoustique (SGA/SSA):

The Swiss Acoustical Society was established in 1971. The majority of the members are consultant engineers and practitioners, mostly in the field of environmental noise protection; only a small minority is doing research.

The aim of the society is the promotion of acoustics in Switzerland by supporting studies and research in the area of acoustics, by exchange of experience between experts, by taking positions on questions of noise control legislation, and by strengthening the cooperation of acousticians over the language borders in this multilingual country.

Four to five times a year the society's newsletter - bilingual in French and German - informs the members about news and topics on acoustics in Switzerland and abroad and covers lectures, courses, congresses, new publications, interesting web pages, and job offers. There is no formal education in Acoustics in Switzerland. Therefore the society offers to its individual members the possibility to pass an examination for the title "Akustiker SGA" and thereby provides proof of their qualifications in acoustics.

Regarding the fields of acoustics SGA's members are interested in, noise control leads with building acoustics and room acoustics coming second. A majority of the members is interested in measuring technique, one third of the members list physical acoustics among their interests and one quarter name musical acoustics and electro-acoustics. This priority is reflected in the choice of subjects treated at the society's events.

SGA/SSA is member of the European Acoustics Association EAA, the International Commission of Acoustics ICA and the International Institute of Noise Control Engineering I-INCE.

New Zealand:

The NZQA has one unit standard related directly to noise control, at Level 3:

- "Demonstrate knowledge of hearing conservation in the workplace".

There is a Diploma qualification offered at Level 6:

- NZIM Diploma in Health and Safety Management, at Level 6.

The Diploma in Health and Safety Management aims to provide current practical and realistic health and safety information.

The course is designed for people whose area of responsibility within industry or government includes health and safety. This may include, but are not restricted to, safety coordinators, risk advisers, occupational health nurses, and human resource managers, training officers, engineers, production supervisors, union officials and insurance personnel.

Programme content includes Management Integrating Health and Safety; Safety and other relevant Compliance Legislation; Employee Health, Welfare and Wellbeing; Employee Development through Training and Involvement; Specialised Workplace Health and Safety Management (of which Noise Management is a part); Hazard Risk Management; and Accident and Incident Management.

The stated Learning Outcomes of the Diploma indicate that successful learners will be able to apply their Noise Management competence:

- Critically assess the effectiveness and value of workplace health and safety within their own organisation.
- Identify and prioritise health and safety training to facilitate responsibility fulfilment within their organisation.
- Use essential 'minimum standard' concepts to respond strategically to workplace health and safety management.
- Develop skills and behaviours which add value to existing skills and knowledge.
- Work openly and positively toward the evaluation and development of workplace health and safety projects.
- Initiate practical systems management and strategies to address health and safety issues.
- Generate positive attitudes towards health and safety and its management within the organisation.

Australia:

In Australia, there appear to be few courses devoted entirely to acoustics; rather it is seen as complementing a wide range of subjects. Advice to those at school is to have a broad range of background subjects at secondary school with a knowledge of basic mathematics and some skills in computing essential (computers are used in all aspects of the design, measurement, and data analysis in acoustics).

While not all people working in acoustics have extensive formal qualifications, some basic training is necessary. Projections in Australia suggest that there will be an increasing demand for people with formal qualifications in the acoustics work force, rather than the "self-trained" workers who have only done a few short courses during their career. Learning should place an emphasis on basic physics and mathematics and include an understanding of wave-motion, basic computing and some electronics and instrumentation. Courses which include a study of optics and electromagnetic theory are useful, as many of the basic ideas and laws developed in these areas are directly transferable to acoustics. Individuals may wish to complement these studies with areas such as architecture, the life sciences including biology or psychology and/or an arts subject like music.

Candidates are advised to extend their studies after obtaining a basic degree and undertake additional work towards a Masters or even a Doctoral degree in acoustics. A number of Universities include acoustics among the areas offered for such training. The following list indicates some types of Faculties and the kind of research topics which may be undertaken:

- Mechanical Engineering: Research into the effects of vibration in various structures, production of turbulent sound from flowing fluids, active noise control.
- Physics: Interaction of sound with materials, basic properties of acoustic materials, behaviour of musical instruments.
- Biology: Communication between living organisms by means of sound, effects of noise on the behaviour of marine and land-based animals - including man.
- Psychology: Problems of speech and hearing and the intelligibility of communication.

Africa:

There is little or no published evidence of comprehensive approaches in Africa to noise control and noise management, apart from South Africa. The isolated examples that appear are in relation to international airports.

South African legislation provides clear guidelines for noise management, and this is reflected in the different municipalities and their policies and regulations. There is a move to develop unified national strategies and approaches to the management of noise in South Africa.

Existing education and training initiatives:

OAITC and UNISA have developed short certificate courses, centering on environmental science and environmental management, to provide tuition for persons who have an interest in the environment. These short courses will be useful for:

- People whose function in the workplace is to undertake environmental audits and or assessments.
- Engineers who wish to include environmental considerations in their development planning.
- People practicing waste management.
- Environmental impact assessors.
- Occupational and environmental hygienists.
- Environmental, health and safety officers.
- Any person whose work involves environmental and ecological assessments.

Learners successfully completing the short courses will gain credits towards UNISA's National Diploma in Environmental Science and Environmental Management.

- Environmental Science & Environmental Management, at NQF Level 5.

Companies and individuals may elect to choose individual modules or the entire learning programme:

- Module 1: Environmental management systems.
- Module 2: Environmental aspects and impacts.
- Module 3: Waste disposal and waste management.
- Module 4: Occupational and environmental noise.
- Module 5: Environmental chemistry and industrial ecology.
- Module 6: Environmental legislation.
- Module 7: Toxicology.
- Module 8: The Kyoto Protocol and the Clean Development Mechanism.

Conclusion:

- It is clear that noise and noise management is viewed as an increasingly important part of planning and development in the future. There are many examples of qualifications at tertiary level, but an obvious need also for access to these qualifications.
- This qualification will provide access to the field, and enable people in local government in particular, to play a vital and informed role in noise management. It provides for immediate skills needs in the sector, as well as progression into more specialist roles.

### **ARTICULATION OPTIONS**

This qualification articulates with the following qualifications:

Vertically with:

- Advanced University Diploma: Occupational Health, NQF Level 6.
- Advanced Diploma: Occupational Health Care, NQF Level 6.
- National Diploma: Environmental Health, NQF Level 6.
- Generic BA Qualification and most of the programmes for Environmental management and Sciences that are registered against it.

Horizontally with:

- ID 58625: National Certificate: Occupational Safety, NQF Level 5.
- ID 58786: National Diploma: Occupational Safety, NQF Level 5.

### **MODERATION OPTIONS**

- Providers offering learning towards this qualification or the component unit standards must be accredited by the relevant ETQA.

- Moderation of assessment will be overseen by the relevant ETQA according to moderation principles and the agreed ETQA procedures.

### **CRITERIA FOR THE REGISTRATION OF ASSESSORS**

- Assessors must be registered as assessors with the relevant ETQA. Assessors should be in possession of a qualification in Environmental Noise at NQF Level 6 or above.

### **NOTES**

### **UNIT STANDARDS**

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	252384	Demonstrate knowledge of the physics of sound	Level 5	8
Fundamental	242726	Facilitate meetings/workshops effectively to achieve	Level 5	4



	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
		organisational outcomes		
Core	252381	Apply principles of acoustics and acoustic screening to noise management decisions.	Level 5	10
Core	252420	Classify noise and verify noise measurement reports	Level 5	6
Core	252387	Demonstrate understanding of, and apply principles to mitigate, transportation noise	Level 5	6
Core	252382	Develop and apply processes and procedures for dealing with alleged noise infringement in a Local Authority	Level 5	8
Core	252371	Provide guidance on legislation and regulations to Local Authorities	Level 5	6
Core	252378	Provide input and guidance to local government departments with respect to noise, and noise-related planning requirements	Level 5	10
Core	252377	Demonstrate understanding of building design and the implications for occupational and environmental noise	Level 6	6
Core	252379	Demonstrate understanding of vibration control	Level 6	8
Elective	14927	Apply problem solving strategies	Level 4	4
Elective	242816	Conduct a structured meeting	Level 4	5
Elective	13952	Demonstrate basic understanding of the Primary labour legislation that impacts on a business unit	Level 4	8
Elective	242658	Demonstrate knowledge and application of the nature of risk and the risk management process	Level 4	4
Elective	13945	Describe and apply the management of stock and fixed assets in a business unit	Level 4	2
Elective	117708	Describe governance and control issues within business systems operations	Level 4	4
Elective	117730	Describe the alignment of the business system to the business strategy and objectives	Level 4	4
Elective	242822	Employ a systematic approach to achieving objectives	Level 4	10
Elective	242813	Explain the contribution made by own area of responsibility to the overall organisational strategy	Level 4	5
Elective	115499	Gather, record and interpret business related information	Level 4	4
Elective	242821	Identify responsibilities of a team leader in ensuring that organisational standards are met	Level 4	6
Elective	115500	Inform client of planned process and follow-up on requests	Level 4	4
Elective	242810	Manage Expenditure against a budget	Level 4	6
Elective	119265	Manage risk in own work environment	Level 4	2
Elective	114589	Manage time productively	Level 4	4
Elective	242829	Monitor the level of service to a range of customers	Level 4	5
Elective	242819	Motivate and Build a Team	Level 4	10
Elective	115498	Resolve client requests and queries	Level 4	4
Elective	242817	Solve problems, make decisions and implement solutions	Level 4	8
Elective	243267	Apply and continuously improve company policies and procedures	Level 5	10
Elective	252037	Build teams to achieve goals and objectives	Level 5	6
Elective	15231	Create and use a range of resources to effectively manage teams, sections, departments or divisions	Level 5	4
Elective	115855	Create, maintain and update record keeping systems	Level 5	5
Elective	252027	Devise and apply strategies to establish and maintain workplace relationships	Level 5	6
Elective	15224	Empower team members through recognising strengths, encouraging participation in decision making and delegating tasks	Level 5	4
Elective	252024	Evaluate current practices against best practice	Level 5	4
Elective	117854	Facilitate meetings to deal with conflict situations	Level 5	8
Elective	115823	Gather and manage information for decision-making	Level 5	5
Elective	15229	Implement codes of conduct in the team, department or division	Level 5	3
Elective	15223	Implement training needs for teams and individuals to upgrade skills levels	Level 5	3
Elective	243265	Manage assets of a business unit	Level 5	12
Elective	116928	Manage diversity in the workplace	Level 5	14
Elective	252034	Monitor and evaluate team members against performance standards	Level 5	8
Elective	117845	Restore and build relationships in dealing with conflict	Level 5	8
Elective	15220	Set, monitor and measure the achievement of goals and	Level 5	4

ID	UNIT STANDARD TITLE	LEVEL	CREDITS
	objectives for a team, department or division within an organisation		



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Provide guidance on legislation and regulations to Local Authorities***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252371	Provide guidance on legislation and regulations to Local Authorities		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>	<b>SUBFIELD</b>		
10 - Physical, Mathematical, Computer and Life Sciences	Environmental Sciences		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	6

**SPECIFIC OUTCOME 1**

Demonstrate knowledge and understanding of the legislation, regulations, protocols and procedures that apply to noise infringements.

**SPECIFIC OUTCOME 2**

Benchmark South African provisions for noise control with international standards.

**SPECIFIC OUTCOME 3**

Provide input and guidance to Local Authorities on legislation and regulations governing noise management.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:**

***Demonstrate understanding of building design and the implications for occupational and environmental noise***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252377	Demonstrate understanding of building design and the implications for occupational and environmental noise		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>		<b>SUBFIELD</b>	
10 - Physical, Mathematical, Computer and Life Sciences		Environmental Sciences	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 6	6

**SPECIFIC OUTCOME 1**

Demonstrate knowledge of internal acoustics in relation to noise control.

**SPECIFIC OUTCOME 2**

Demonstrate an understanding of building design in relation to environmental noise.

**SPECIFIC OUTCOME 3**

Provide input to planning and/or problems related to building design and noise.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:**

*Provide input and guidance to local government departments with respect to noise, and noise-related planning requirements*

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252378	Provide input and guidance to local government departments with respect to noise, and noise-related planning requirements		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>	<b>SUBFIELD</b>		
10 - Physical, Mathematical, Computer and Life Sciences	Environmental Sciences		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	10

**SPECIFIC OUTCOME 1**

Contribute to strategic policy documents dealing with noise control.

**SPECIFIC OUTCOME 2**

Develop and maintain noise management systems.

**SPECIFIC OUTCOME 3**

Establish mechanisms for planning around sound and noise.

**SPECIFIC OUTCOME 4**

Provide input to planning from a noise perspective.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate understanding of vibration control***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252379	Demonstrate understanding of vibration control		
<b>ORIGINATOR</b>			<b>PROVIDER</b>
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>			<b>SUBFIELD</b>
10 - Physical, Mathematical, Computer and Life Sciences			Environmental Sciences
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 6	8

**SPECIFIC OUTCOME 1**

Demonstrate understanding of vibration and noise.

**SPECIFIC OUTCOME 2**

Assess vibration and interpret results.

**SPECIFIC OUTCOME 3**

Recommend measures to limit vibration-related noise.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	ID	QUALIFICATION TITLE	LEVEL	STATUS	END DATE
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:**

***Apply principles of acoustics and acoustic screening to noise management decisions.***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252381	Apply principles of acoustics and acoustic screening to noise management decisions.		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>		<b>SUBFIELD</b>	
10 - Physical, Mathematical, Computer and Life Sciences		Environmental Sciences	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	10

**SPECIFIC OUTCOME 1**

Demonstrate understanding of acoustics and acoustic screening.

**SPECIFIC OUTCOME 2**

Demonstrate knowledge of acoustic screening material.

**SPECIFIC OUTCOME 3**

Demonstrate knowledge of screening methods.

**SPECIFIC OUTCOME 4**

Apply principles to particular screening scenarios.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:**

***Develop and apply processes and procedures for dealing with alleged noise infringement in a Local Authority***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252382	Develop and apply processes and procedures for dealing with alleged noise infringement in a Local Authority		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>	<b>SUBFIELD</b>		
10 - Physical, Mathematical, Computer and Life Sciences	Environmental Sciences		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	8

**SPECIFIC OUTCOME 1**

Develop by-laws for dealing with noise infringements.

**SPECIFIC OUTCOME 2**

Develop and maintain municipal office protocols and procedures.

**SPECIFIC OUTCOME 3**

Implement and monitor noise control.

**SPECIFIC OUTCOME 4**

Facilitate the development of policy in response to noise legislation.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	





## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Demonstrate knowledge of the physics of sound***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252384	Demonstrate knowledge of the physics of sound		
<b>ORIGINATOR</b>	<b>PROVIDER</b>		
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>	<b>SUBFIELD</b>		
10 - Physical, Mathematical, Computer and Life Sciences	Environmental Sciences		
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	8

**SPECIFIC OUTCOME 1**

Demonstrate knowledge of scientific principles of sound.

**SPECIFIC OUTCOME 2**

Demonstrate understanding of the speed of sound and implications for noise measurement.

**SPECIFIC OUTCOME 3**

Demonstrate understanding of noise measurement.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Fundamental	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:**

***Demonstrate understanding of, and apply principles to mitigate, transportation noise***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252387	Demonstrate understanding of, and apply principles to mitigate, transportation noise		
<b>ORIGINATOR</b>		<b>PROVIDER</b>	
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>		<b>SUBFIELD</b>	
10 - Physical, Mathematical, Computer and Life Sciences		Environmental Sciences	
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	6

**SPECIFIC OUTCOME 1**

Demonstrate understanding of transportation noise.

**SPECIFIC OUTCOME 2**

Discuss noise prevention and mitigation measures for transportation noise.

**SPECIFIC OUTCOME 3**

Provide input to planning to balance environmental, economic and political issues with respect to transportation noise.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	



## SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**UNIT STANDARD:*****Classify noise and verify noise measurement reports***

<b>SAQA US ID</b>	<b>UNIT STANDARD TITLE</b>		
252420	Classify noise and verify noise measurement reports		
<b>ORIGINATOR</b>			<b>PROVIDER</b>
SGB Environmental Sc/Mgt & Waste Mgt			
<b>FIELD</b>			<b>SUBFIELD</b>
10 - Physical, Mathematical, Computer and Life Sciences			Environmental Sciences
<b>ABET BAND</b>	<b>UNIT STANDARD TYPE</b>	<b>NQF LEVEL</b>	<b>CREDITS</b>
Undefined	Regular	Level 5	6

**SPECIFIC OUTCOME 1**

Classify noise in terms of legal descriptions and impact.

**SPECIFIC OUTCOME 2**

Identify and apply the regulations and standards that govern the limits and responses to different noise types.

**SPECIFIC OUTCOME 3**

Demonstrate understanding of, and verify noise measurements.

**SPECIFIC OUTCOME 4**

Demonstrate understanding of noise mitigation.

**QUALIFICATIONS UTILISING THIS UNIT STANDARD**

	<b>ID</b>	<b>QUALIFICATION TITLE</b>	<b>LEVEL</b>	<b>STATUS</b>	<b>END DATE</b>
Core	59325	National Certificate: Environmental Noise Control	Level 5	Draft - Prep for P Comment	