

DEVELOPMENT OF GENERIC AND SECTORAL COMPETENCIES IN THE WATER SUPPLY AND SANITATION TRAINING SECTOR

Report to the
Water Research Commission

by

National Community Water and Sanitation Training Institute (NCWSTI)
P O Box 3101
Sovenga
0727

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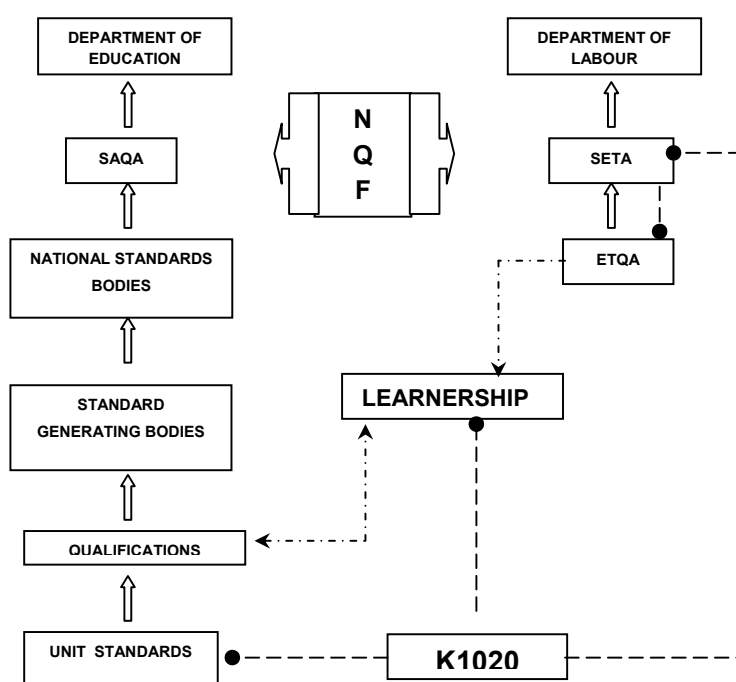
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EXECUTIVE SUMMARY

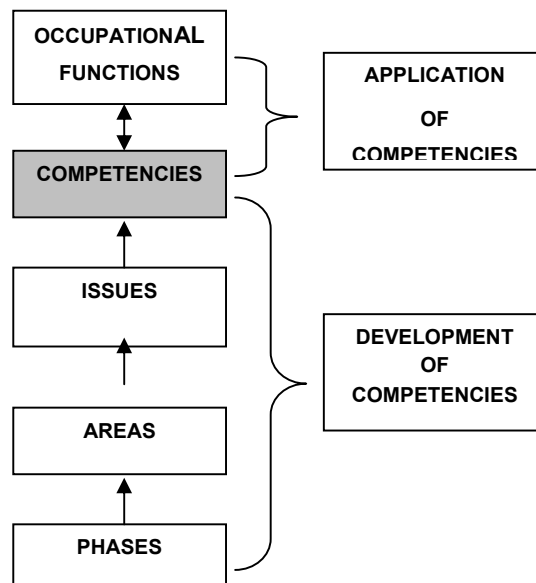
This report emanates from a project financed by the Water Research Commission. The idea of developing competencies was first conceived in 1998 by NCWSTI. A project proposal was submitted to the Water Research Commission and the project was approved in 1998 commenced in January 1999 and was completed in June 2001.

The aim of the research project was to develop generic and sectoral competencies for the community water supply and sanitation sector. However, during the research period a number of initiatives took place in parallel with the development of the competencies for this research project, which greatly influenced and to some extent altered the original project proposal e.g. the establishment of the interim committee for the Establishment of Standard Generating Bodies (SGB) and the establishment of the Water Chamber of the LGWSETA (Local Government, Water and Related Services Sector Education and Training Authority).

The following diagram indicates the relationship between this research project and these initiatives.



To achieve the outcome a process was developed by the research team. The final outcome for the research project was a database containing approximately 3625 competencies, 77 occupational functions, 12 Issues, 5 Areas and 6 Phases. The following flow diagram shows the relationship between the steps in the process.



The database is available in an electronic format. A user's manual (Appendix 1) is also available to use with the database of competencies which can be downloaded from the WRC website <http://www.wrc.org.za>

The research products, namely a database containing 3625 competencies linked to 77 “occupational functions” relevant to the water and sanitation sector can be applied in the water and sanitation sector in the following ways:

- Learnership and unit standard setting process;
- Training;
- Skills development;
- Development of qualification packages; and
- Quality control in training in the water and sanitation sector.

It is recommended that there is joint custodianship of the products by National Community Water and Sanitation Training Institute and Water and Related Services Sector Education and Training Authority (LGWSETA)

To ensure utilization and application of the competencies, to avoid duplication and to guarantee that the investment is not wasted the following further recommendation are proposed to take the products to the sector:

- Water service authorities should be informed about the products so that these could be used to empower employees.
- The project be linked to the learnership project sponsored by DANIDA.
- The project can be introduced to the sector by the following means:
 - Production of a brochure;
 - Production of a compact disc and user manual;
 - E-mail to databases supplied by organizations;
 - Presentations at workshops;
 - Websites – NCWSTI and WRC and linked to other relevant websites; and
 - Presentation of a paper at the ITN Conference.

ACKNOWLEDGEMENTS

This is a report on a research project funded by the Water Research Commission and entitled:

DEVELOPMENT OF GENERIC AND SECTORAL COMPETENCIES IN THE WATER SUPPLY AND SANITATION TRAINING SECTOR

The Steering Committee responsible for this research project consisted of the following persons:

Dr N Mjoli	Water Research Commission
Dr SA Mitchell	Water Research Commission
Mr C Crawford	Department of Water Affairs and Forestry
Mr TM Madgwick	Umgeni Water
Ms A Potter	Mvula Trust
Mr Z Mbanguta	Department of Education
Ms C Pratt-Moloto	Department of Water Affairs and Forestry
Mr T Moeketsi	Department of Water Affairs and Forestry
Mr P Ntsime	Department of Water Affairs and Forestry
Mr T Pule	Department of Health
Mr C Jappie	LGWSETA
Mrs CM Smit	Water Research Commission Committee Services

Funding support from the Water Research Commission (WRC) is gratefully acknowledged. The Commission is also thanked for recognizing the importance of building capacity in the area of training and development.

This research project was only possible with the co-operation of the following individuals within the NCWSTI: Mr James O'Donovan, Mrs Vhutshilo Masibigiri, Mr Martin Nyirenda, Mrs Ursula Moodie, Dr A Shaker, and Mr Kojo Spio.

The following individuals are acknowledged gratefully for their inputs:

- o The Steering Committee Members for the Establishment of Standard Generating Body (SGB for water) for their inputs.
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- o The administrative staff of the NCWSTI, Flora Kgoahla, Sarah Mathobela, Jane Makgoba and Olga Ledwaba.
- o And all the other individuals who participated in the brainstorming sessions.

ABBREVIATIONS

ABET	Adult Basic Education and Training
CBT	Competency-based training
CO ₂	Carbon Dioxide
COD	Chemical Oxygen Demand
CWSS	Community Water Supply and Sanitation
DO	Dissolved Oxygen
DWAF	Department of Water Affairs and Forestry
ETQA	Education and Training Quality Assurance
Fe	Iron
GP	Grinder Pump
HRD	Human Resources Development
ISD	Institutional and Social Development
LGWSETA	Local Government Water and Related Services Sector Education and Training Authority
MLSS	Mixed Liquor Suspended Solids
N	Nitrogen
NCWSTI	National Community Water and Sanitation Training Institute
NH ₃	Ammonia
NQF	National Qualifications Framework
NSB	National Standards Bodies
OFID	Occupational Function ID
OHS	Occupational Health and Safety
P	Phosphorus
(PO ₃) ₄	Phosphate ion
RAS	Return Activated Sludge
SABS	South African Bureau of Standards
SAQA	South African Qualifications Framework
SDGS	Small Diameter Gravity Sewer
SETA	Sector Education and Training Authority
SGB	Standards Generating Bodies
SGB	Standards Generating Body
STEP	Septic Tank Effluent Pump
VIP	Ventilated Improved Pit
WRC	Water Research Commission

NOTES ON TERMINOLOGY

The following terms that have been used throughout the research project and are gleaned from various literature sources;

- **Community** – People living in a specific geographic location which can be identified as a town or village.
- **Competence** – is the ability to perform a particular activity to a prescribed standard. It is a wide concept which embodies the ability to transfer skills and knowledge to new situations within the occupational area. It includes those qualities of personal effectiveness that are required in the workplace to deal with co-workers, managers and customers
- **Competencies** - are internal capabilities that people bring to their jobs; competencies are simply a description of skills, knowledge, attitudes, and values required for effective performance in a work situation.
- **Competency** - a competency can also be defined as an area of knowledge or skill that is critical for producing key outputs.
- **Core competencies** – Core competencies refer to performance dimensions, key success criteria, and success formulas. The belief behind them is that certain skills, traits, and attitudes will predispose individuals and companies to success
- **Credits** – are described as recognition by an accredited body that a learner has satisfied the outcomes of a unit of learning expressed as a credit value at a specified level.
- **Development** - In this research project, development is defined as a phase that involves the construction of competencies to be used by learners.
- **Generic competencies** – in this context, are the knowledge, skills, attitudes, values, motivations, and beliefs people must have in order to be successful in a career in the water and sanitation sector.
- **Knowledge** – knowledge is what people need to know, such as subject matter, concepts, or facts, in order to do a job

- **Occupational Functions** – also known as occupational roles, are a common grouping of competencies.
- **Qualifications** – are the formal recognition of the achievement of the required number and range of credits and such other requirements at specific levels of the NQF as may be determined by the relevant bodies registered for such purposes by SAQA.
- **Skill or abilities** – what people must know in order to perform a job. Skills can include hand skills, thinking skills, social skills, teamwork and economic skills. Skills can be sub-divided into hard-skills (those which are easily observable) and soft-skills (those that are more intangible and difficult to qualify).
- **Training** - Training is viewed as nothing less than the act of creating a more superior competence than existed before, and the end result will be employees who emerge with confidence and commitment; employees committed to improving themselves on an on-going basis; employees who are able to perform, and more important, want to perform the things you have taught them to do. Training must encompass performance improvement.

Values are deep-seated, pervasive standards that influence almost every aspect of our lives.

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1 BACKGROUND TO THE RESEARCH PROJECT

The research project was conceived in 1998 in order to solve problems in training and capacity building by ensuring quality controlled training provision in the water and sanitation sector. The need for the development of competencies for the water and sanitation sector was identified and a project proposal was submitted to WRC, which was approved toward the end of 1998. The research was commenced in January 1999.

The following deficiencies in the training and capacity building initiatives of the water and sanitation sector were identified at the time in the project proposal:

- There were no clear, adequate goals and standards for training;
- Training programs were fragmented;
- Uncoordinated communication and liaison between the various training organizations which were offering training in the sector;
- There were no formal forums to co-ordinate planning and assessment of the courses offered;
- The course contents, duration, standards and techniques used, differed considerably in such a way that skills acquired in one context were difficult to utilize in other contexts, even within the same sector;
- Courses tended to be inappropriate in terms of present and future needs of the sector.

It was envisaged that the development of competencies for the water and sanitation sector would address these deficiencies. However, during the period that this research was undertaken initiatives to create forums and means to quality control training e.g. Standards Generating Bodies (SGBs) and the Water Chamber of the LGWSETA and the development of unit standards, were initiated. It was realized that the process of developing competencies could not be done in isolation from the activities of the Water Chamber of the LGWSETA and the SGB. This research project therefore had to run in parallel and had to be complementary to all these new initiatives.

The following flow diagram illustrates the relationship of this project to the other initiatives in the sector.

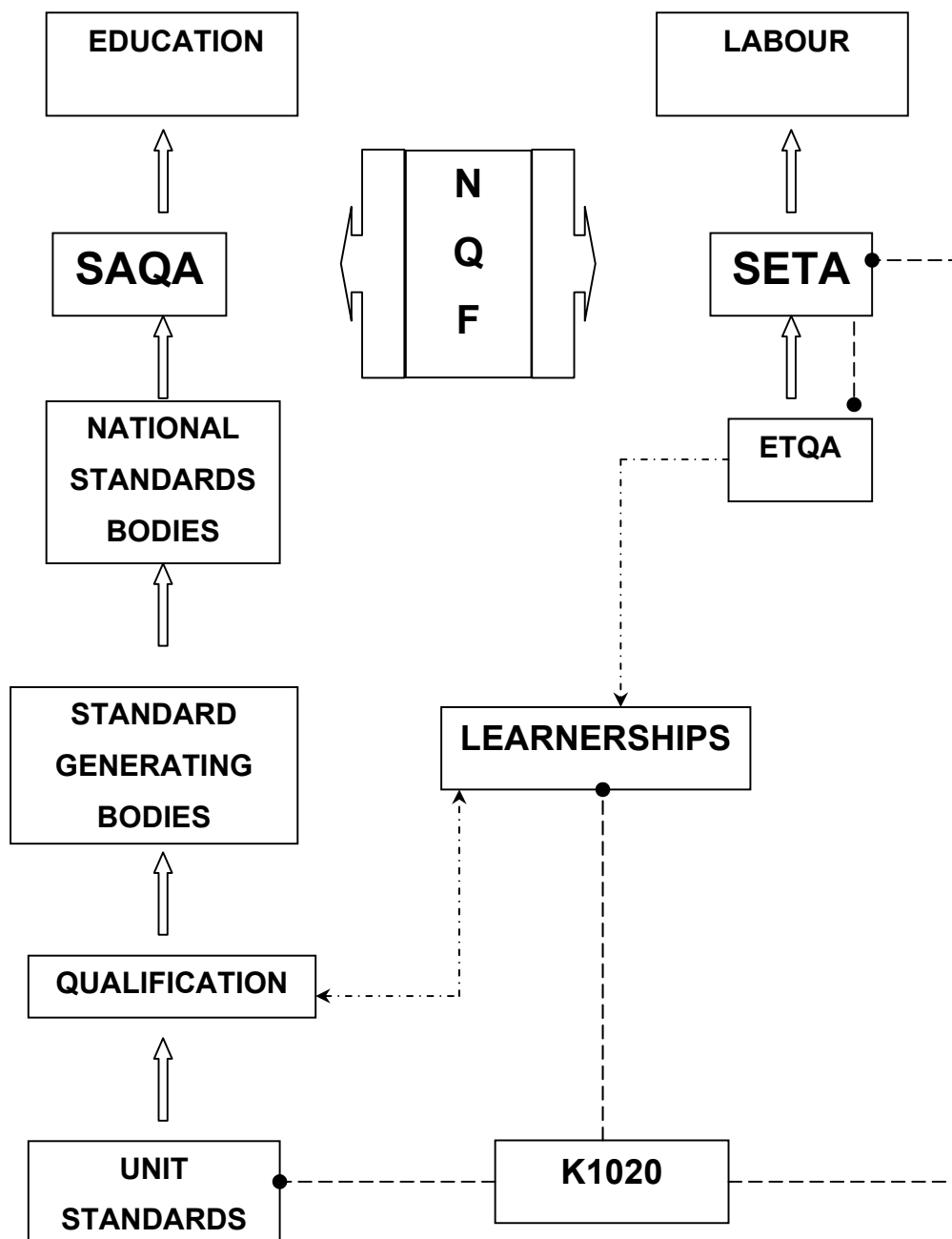


Diagram 1: The project K1020 in relationship to the NQF process

The competencies developed will be public domain and this research project will support and supplement the learnership processes as well as the unit standard setting process for the Local Government Water and Related Services SETA (LGWSETA) and the Committee for the Establishment of the Standard Generating Bodies (SGB) as reference material. The research project was informed of all the developments in the education and training sector by NCWSTI's involvement in the activities of the both the LGWSETA and the SGB.

2 RESEARCH PROJECT AIMS

The aims for the research project as per the project proposal are as follows:

1. develop generic, sectoral and target modular based competencies;
2. develop a model which is believed to be able to facilitate co-ordination and standardization of training;
3. to collect and evaluate all available information on the existing training competencies, both international and national (literature survey);
4. identify the shortcomings in the existing competencies in use in water and sanitation training; and
5. design and develop modular based competencies which are appropriate to and in accordance with sectoral needs and the National Qualifications Framework.

Due to all the developments in the standardization of training, in the water and sanitation sector in South Africa, these objectives were revisited and reaffirmed as the research project developed and the new initiatives were introduced. Aim 2 was removed to ensure that the research project did not assume the functions delegated to other organizations such as Local Government Water and Related Services SETA (LGWSETA) and the Committee for the Establishment of the Standard Generating Bodies (SGB). However, the research project would complement and inform the work done by Local Government Water and Related Services SETA (LGWSETA) and the Committee for the Establishment of the Standard Generating Bodies (SGB).

3 LITERATURE SURVEY

A literature survey was done both nationally and internationally, using the Internet as well as books and documents. The literature survey was performed to avoid duplication and also to obtain guidance from other role players and departments in the education and training sector.

The literature review included:

- the developments within the South African Education and Training sector with special reference to the roles and responsibilities of each structure;
- how other organizations and individuals have developed competencies; and
- the unit standards/competencies developed by other organizations both nationally and internationally.

Information was received from many areas including countries such as South Africa, New Zealand, and Australia. All attempts to gather information on competencies from other African countries failed. Internet searches on other developing countries e.g. Malaysia also did not deliver any competencies in the water and sanitation sector.

From the literature survey a number of definitions of competencies and approaches to the development of competencies, as well as competencies developed by other organizations were reviewed. This review of competencies resulted in NCWSTI adopting the following definition for competencies:

competencies are a description of skills, knowledge, attitudes, and values required for effective performance in a work situation. Competencies detail the outcomes of work and should be stated as clearly as possible so that the outcomes they describe are the best that they can be.

It was also established that a comprehensive set of competencies should reflect the following characteristics:

- The competencies should ensure that the learning processes are focused on helping people learn the skills and knowledge required by the sector.

- The competencies should promote flexibility. Learning can take place in a variety of settings and there may be a variety of methods used, but as long as the learners can demonstrate competence.
- Competencies should be nationally consistent with the requirements of the sector in which they are applied, so that people who learn the skills in one place will be able to relocate anywhere in the country and remain confident that they will be employable.

From the literature survey the linkages between this research program and the learnership and unit standard setting processes were established. Credits for learnerships and qualifications are based on unit standards. Several unit standards are needed to produce a learnership or qualification. The competencies that have been developed will be able to inform the title of the unit standard, the range statement as well as the assessment criteria and therefore indirectly inform the learnership and qualification processes.

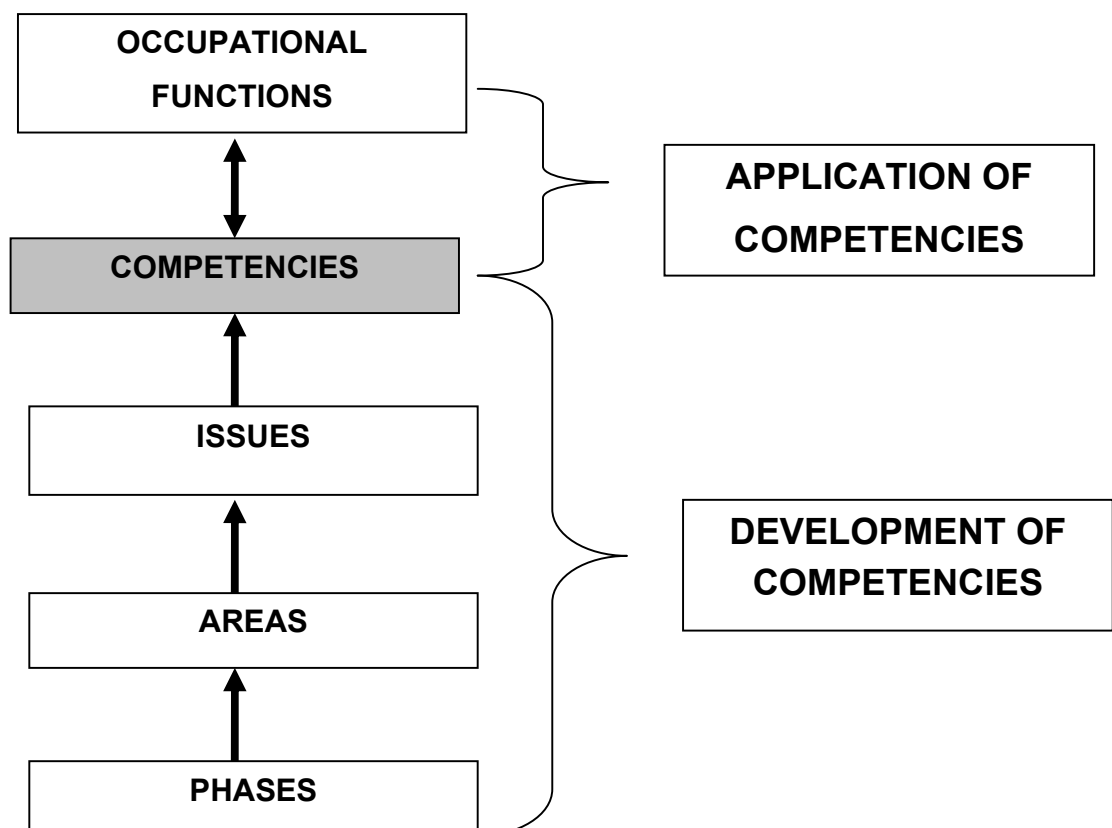
4 MATERIALS AND METHODOLOGY

4.1 Method

The final product for the research project was approximately 3625 competencies. To achieve this outcome a process was developed by the research team. This process can be divided into the following steps:

- Identification of phases in the water and sanitation sector;
- Identification of areas;
- Identification of issues per area;
- Identification of the competencies per area;
- Identification of occupational functions within the water and sanitation sector
- Linking the competencies to occupational functions

Diagram 2: The following is a schematic presentation of how the competencies are linked to the phases, areas, issues, and how the competencies and occupation functions are linked.



4.1.1 IDENTIFICATION OF PHASES IN THE WATER AND SANITATION SECTOR

The identification of the phases was based on the domains of the Interim Committee for the Establishment of Standard Generating Body (SGB), which are:

- planning and design,
- construction,
- operation,
- maintenance, and
- management and training.

However, it was felt that these domains did not include all the phases in the project cycle and the NCWSTI adopted the following phases namely:

- design;
- implementation;
- maintenance;
- monitoring and evaluation;
- operation; and
- planning.

4.1.2 IDENTIFICATION OF AREAS

To align the competencies to the water and sanitation sector the following broad areas were identified and then linked to the phases:

- environmental sanitation;
- wastewater treatment;
- water resources;
- water supply; and
- water treatment.

Example:

If the phase is design this could apply to the following areas environmental sanitation; wastewater treatment; water resources; water supply; and water treatment.

4.1.3 IDENTIFICATION OF ISSUES PER AREA

The next linkage is the issues to the area. The following is a list of the issues identified:

- Social
- Cultural
- Health and Hygiene
- Gender
- Environmental
- Technical
- Economic
- Financial
- Institutional
- Management
- Political
- Monitoring and evaluation

Example:

In the phase **Implementation** in the area of **Environmental Sanitation** the following issues need to be addressed: social; cultural; health and hygiene; gender; environmental; technical; economic; financial; institutional; management; political and monitoring and evaluation.

4.1.4 IDENTIFICATION OF THE COMPETENCIES PER AREA

The next step in the process was the identification of the competencies.

The competencies were developed using several approaches identified in the literature survey namely the bottom-up approach, the functional analysis approach and the occupational function approach.

As per the project proposal the competencies needed to be further sub-divided into generic and sectoral competencies. It was realised by the research team that these two types of competencies are interdependent ,therefore it was difficult to separate one from the other. This resulted in the use of both types of competencies, generic and water-specific (sectoral), in many of the occupational functions developed.

For a detailed list of the 3625 competencies developed please refer to the compact disc in volume 2: User's manual.

4.1.5 IDENTIFICATION OF OCCUPATIONAL FUNCTIONS WITHIN THE WATER AND SANITATION SECTOR

To make the competencies more practical to the sector they were also linked to “occupational functions” which were selected by the researchers based on the premise that these “occupational functions” are considered to be the most important in the water and sanitation sector. The following is a list of these occupational functions:

- Administering health& safety procedures
- Archiving (record keeping)
- Assessing environmental impact of water supply project
- Billing
- Collecting revenue
- Community development
- Community mobilization and awareness creation
- Conducting feasibility studies
- Constructing toilets
- Contracting and construction
- Customer care and public relations
- Design a water supply project
- Designing
- Designing toilets
- General administration duties
- General book keeping duties
- General cleaning

- General financial management
- General house-keeping duties
- General management duties
- General secretarial duties
- Install electrical equipment
- Install mechanical equipment
- Install water distribution system
- Laboratory duties
- Local governance
- M&E a water supply project
- Maintain electrical equipment
- Maintain electronic equipment
- Maintain mechanical equipment
- Maintain wastewater treatment plant
- Maintain water distribution
- Maintaining toilets
- Manage a water supply project
- Manage contracts
- Manage effluent
- Manage ground water
- Manage procurement of materials
- Manage sludge
- Manage water treatment plant
- Managing alternative water resources
- Managing community health
- Managing construction
- Managing environmental health
- Managing extraction of ground water
- Managing extraction of surface water
- Managing human resources
- Managing information technology

- Managing labour relations
- Managing occupation health and safety procedures
- Managing solid waste
- Managing water catchment areas
- Meter reading
- Monitoring and controlling quality of water
- Operate and maintain wastewater collection systems
- Operate electrical equipment
- Operate mechanical equipment
- Operate pumps
- Operate wastewater treatment plant
- Operate water collection systems
- Operate water treatment plant
- Operating toilets
- Pipe laying
- Planning distribution systems
- Plumbing
- Prepare budgets
- Prepare financial statements
- Recharge ground water
- Regulating catchment areas
- Soil types testing
- Supervise budgets
- Supervising personnel
- Surveying surface grades
- Surveying water resources
- Training and capacity building
- Trenching
- Write a business plan

4.1.6 LINKING THE COMPETENCIES TO OCCUPATIONAL FUNCTIONS

The final step in the process was linking the competencies to the occupational functions. Many of the competencies are generic and are linked to several occupational functions whereas the sectoral competencies are only linked to specific occupational functions. However, the competencies per occupational function are a combination of both generic and sectoral competencies.

Example:

The occupational function **general administration duties** may have generic competencies that apply to the occupational function in other areas such as mining, irrigation etc. However, if the person were operating in the area of wastewater treatment this person would have to have certain sectoral competencies that are sector specific.

4.2 Materials

To do justice to the research work done by the team, an electronic format of the research project was developed to ensure optimal use of the competencies developed. The database that was developed is stored on a compact disc (CD). A user's manual is also available to use with the CD.

4.2.1 AIM OF THE WATER & SANITATION COMPETENCIES DATABASE

The primary aim of the database is to facilitate rapid sampling and management of competencies related to “occupational functions” or jobs in the water and sanitation sector.

4.2.2 OBJECTIVES

Together with the objectives of the whole research project, the database performs the following functions:

- o To provide a representative and comprehensive list of competencies for a particular job/position (here known as “occupational functions”) in the sector;
- o To develop a system for rapid determination of training requirements in the sector using expected competencies and available competencies.

- To act as a tool for bench-marking in as far as expected competencies in the sector are concerned.

4.2.3 AVAILABILITY OF MATERIALS

For further enquiries regarding the user's manual and the compact disc please contact:

- Water Research Commission
PO Box 824
Pretoria 0001
Tel No:
Email:
- National Community Water and Sanitation Training Institute
PO Box 3101
Sovenga 0727
Tel No: (015) 268 3270
Email: ncwsti5@lantic.net or ncwsti@pixie.co.za

5 DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

This section will outline the achievement of the aims of the project, research products developed, benefits to the sector, recommendations for further research and conclusions drawn from the findings.

5.1 Achievements of research project aims

All the research projects aims but one were achieved. The research aim not achieved was because it became the function of the interim committee for the Establishment of Standard Generating Bodies (SGB) and the Water Chamber of the Local Government, Water and Related Services Sector Education and Training Authority (LGWSETA).

According to the aims of the research project the following outputs were achieved:

- Approximately 3625 generic, sectoral and target competencies were developed;
- 77 occupational function in the water and sanitation sector were identified;
- all available information on the existing training competencies, both international and national were collected to avoid duplication of efforts;
- shortcomings in the existing competencies in use in water and sanitation training were identified and developed; and
- competencies were developed that are appropriate to and in accordance with sector needs and the National Qualifications Framework.

5.2 Research products achieved

The following research products were the outcome of this research project:

- A literature survey - done both nationally and internationally, in and also outside the water sector
- 3625 competencies (both generic and sectoral) developed for the sector.
- competencies developed for seventy-seven (77) “occupational functions”.

- In addition the researchers also looked at other areas, for example the development of unit standard and established how the competencies developed could be of assistance to the process of unit standard setting and possibilities of further research.

5.3 Application of research products

The research products, namely 3625 competencies linked to 77 “occupational functions” relevant to the water and sanitation sector can be applied in the water and sanitation sector in the following ways:

5.3.1 LEARNERSHIP AND UNIT STANDARD SETTING PROCESS

- The research project will contribute to capacity building in the water sector through the unit standard setting processes and the learnership processes.
- The competencies will serve as reference material for the process of learnership and unit standard setting for the sector.
- The competencies can inform the title, range statements and assessment criteria of the unit standards.
- A learnership is made up of several unit standards so the competencies could indirectly inform the learnership process.
- Qualifications are composed of credits obtain against unit standards. The competencies could provide the basis of a national system for industry-specific qualification packages, and facilitate greater access to public sector training provisions relevant to the sector.
- Developing quality assurance guidelines for the water and sanitation sector.
- Developing a common and clear understanding of outcomes across the industry through competency certification.
- Developing a national system for industry-specific qualifications.

5.3.2 TRAINING

- The research project will contribute to capacity building in the water sector through the learning needs analysis and in the development of training programs for the sector.

- The lists of competencies related to the “occupational functions” can be used to determine training needs or learning needs.
- The competencies developed will allow for greater efficiency in delivery and reduce the duplication of training or teaching effort, enhance accountability of education and training providers for outcomes, and also encourage skills development that is broad and relevant to the future.
- The competencies may be used in the process of measuring training results that are linked to the assessment criteria of the unit standards.
- Facilitation of greater access to public sector training provisions relevant to the sector.
- Instilling greater confidence in industry as a result of assessment based on standards.
- Ensuring greater efficiency in delivery and reduce the duplication of training or teaching effort.
- Enhancing accountability of education and training providers for outcomes.
- Developing a process for measuring training results.
- Assisting the design of competency-based training (CBT) program both in formal settings and on-the-job training and in the assessment of such training program.

5.3.3 SKILLS DEVELOPMENT

- The research project will provide a basis for common and clear understanding of outcomes across the industry through competency certification, and allow for better identification and match of overall skills needed for the industry.
- Competencies can also be used when doing job analysis and performance appraisal.
- Identifying and matching of overall skills needed for the industry.
- Encouraging skills development that is broad and relevant to the future.
- Encouraging workers to assess their own training needs by indicating which tasks they would like to know more about, which skills they would like to improve;
- Comparing the present level of performance against the desirable benchmark that can then help to determine immediate training and development needs.

5.3.4 GENERAL

- The competencies can be used when planning the strategic direction of the organization (for example long-term career planning, performance management), since they offer a clear understanding of the required standards of performance.
- A clear set of competencies will help the interviewers to get the right person for the advertised job, by identifying all the various tasks, knowledge, skills, abilities and responsibilities that a successful candidate must have.

This research project did not only contribute to the sector but also contributed to the capacity building of the staff of NCWSTI. The benefits for NCWSTI were opportunities for capacity building of NCWSTI staff in the following ways:

- NCWSTI staff were given training on how to generate unit standards. This was done to ensure that the process of development of competencies would be complimentary and supportive of the unit standard setting process of the SGB.
- The NCWSTI is engaging in experiential training of individual students on issues like research, administration and Internet use towards their diplomas from various training organizations. The students receiving practical experience at the NCWSTI were involved in the research project as support staff and thereby gained experience in research. The administrative staff involved in this research project are Jane Makgoba, Sarah Mathobela, Florah Kgoahla and Olga Ledwaba.

5.4 Recommendations

It is recommended that there is joint custodianship of the products by National Community Water and Sanitation Training Institute and Water and Related Services Sector Education and Training Authority (LGWSETA)

The competencies developed can be used as a support mechanism by the learnership committees, interim committee for the Establishment of Standard Generating Bodies (SGB) and the Water Chamber of the Local Government, Water and Related Services Sector Education and Training Authority (LGWSETA) in the following areas:

- Generation of unit standards for the water and sanitation sector;
- Development of qualification packages;

- Learnerships; and
- Quality control in training in the water and sanitation sector.

To ensure utilization and application of the competencies, to avoid duplication and to guarantee that the investment is not wasted the following further recommendation are proposed to take the products to the sector:

- Water service authorities should be informed about the products so that these could be used to empower employees.
- The project be linked to the learnership project sponsored by DANIDA.
- The project can be introduced to the sector by the following means:
 - Production of a brochure;
 - Production of a compact disc and user manual;
 - E-mail to databases supplied by organizations;
 - Presentations at workshops;
 - Websites – NCWSTI and WRC and linked to other relevant websites; and
 - Presentation of a paper at the ITN Conference.

5.5 Synopsis

This project report outlines the background to the project, shows the relationship between this project and the other initiatives in the sector, states the project aims and gives a brief overview of the literature survey that was done.

The materials and methods are also discussed as well as the application and utilisation of the research products by the water and sanitation sector. It is essential that this document is used in conjunction with volume 2: User's manual for the competencies for the water and sanitation sector. And the compact disc containing the 3625 competencies developed.

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APPENDIX 1: USER'S MANUAL FOR THE COMPETENCIES FOR THE WATER AND SANITATION SECTOR

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INSTRUCTOR'S MANUAL FOR THE COMPETENCIES FOR THE WATER AND SANITATION SECTOR

The project team realized during Phase 2 of the research project that, to do justice to the research work done by the team, an electronic format of the research project would need to be developed to ensure optimal use of the competencies developed. A database was developed and this is included on a CD.

1 AIM OF THE WATER & SANITATION COMPETENCIES DATABASE

The primary aim of the database is to facilitate rapid sampling and management of competencies related to “occupational functions” or jobs in the water and sanitation sector.

2 OBJECTIVES

Together with the objectives of the whole research project, the database performs the following functions:

- o To provide a representative and comprehensive list of competencies for a particular job/position (here known as “occupational functions”) in the sector;
- o To develop a system for rapid determination of training requirements in the sector using expected competencies and available competencies.
- o To act as a tool for bench-marking in as far as expected competencies in the sector are concerned.

3 DEFINITIONS:

- o Main Switchboard: also referred to as the Main Menu; it has the title of Competencies Board. It functions to integrate accessibility of the various information in the database.
- o Occupational functions: is a field in the database representing more than job title of an organization. An Occupational function may have different job-titles depending on the Organization.
- o Competencies: A list of knowledge and skills needed in performing a specific task.

- o Issues: These are aspects of a competency related to the broader applicability to the sector. Examples of Issues include Technical, social, gender, etc.
- o Phases: These refer to when do we apply a specific competency e.g. in planning phase, designing, implementation, etc.
- o Areas: There are four main areas in the water and sanitation sector; these are water treatment, water supply, wastewater treatment, and environmental sanitation.
- o Shortcut: An icon on the desktop used for launching applications fasts.

4 LISTS OF IDS FOR OCCUPATIONAL FUNCTIONS, ISSUES, PHASES AND AREAS

These lists must be used with the Compact Disc

4.1.1 LIST 1: OCCUPATIONAL FUNCTIONS AND THEIR OFIDs

OFID	Occupational Function
1	Planning distribution systems
2	Assessing EI of water supply project
3	Conducting feasibility studies
4	Write a business plan
5	General book keeping duties
6	Billing
7	Collecting revenue
8	Maintain water distribution
9	Install water distribution system
10	Manage contracts
11	Operate pumps
12	Manage a water supply project
13	Trenching
14	Pipe laying
15	Design a water supply project
16	M&E a water supply project
17	Monitoring and controlling quality of water
18	Community mobilization and awareness creation
19	Archiving (record keeping)
20	Meter reading
21	Training and capacity building

OFID	Occupational Function
22	Customer care and public relations
23	Administering health& safety procedures
24	Managing labour relations
25	Managing extraction of ground water
26	Managing extraction of surface water
27	Managing information technology
28	Supervising personnel
29	General cleaning
30	General house-keeping duties
31	Maintain electrical equipment
32	Maintain mechanical equipment
33	Plumbing
34	Laboratory duties
35	Manage procurement of materials
36	Prepare budgets
37	Supervise budgets
38	Prepare financial statements
39	General administration duties
40	General secretarial duties
41	General management duties
42	Managing occupation health and safety procedures
43	Managing human resources
44	Surveying water resources
45	Surveying surface grades
46	Soil types testing
47	Local governance
48	Community development
49	Managing community health
50	Managing environmental health
51	Managing construction
52	Contracting and construction
53	General financial management
54	Operate water treatment plant
55	Manage water treatment plant
56	Manage sludge
57	Manage effluent
58	Designing
59	Manage ground water
60	Recharge ground water
61	Operate wastewater treatment plant
62	Maintain wastewater treatment plant
63	Managing alternative water resources
64	Managing water catchment areas
65	Operate and maintain wastewater collection systems

OFID	Occupational Function
66	Regulating catchment areas
67	Designing toilets
68	Constructing toilets
69	Operating toilets
70	Maintaining toilets
71	Managing solid waste
72	Maintain electronic equipment
73	Install mechanical equipment
74	Install electrical equipment
75	Operate electrical equipment
76	Operate mechanical equipment
77	Operate water collection systems

4.1.2 LIST 2: ISSUES AND THEIR ISSUEIDS

IssuesID	Issues
1	Social
2	Cultural
3	Health and Hygiene
4	Gender
5	Environmental
6	Technical
7	Economic
8	Financial
9	Institutional
10	Management
11	Political
12	Monitoring and evaluation

4.1.3 LIST 3: AREAS AND THEIR AREAIDS

OFAREAID	Occupational FAREA
1	Water treatment
2	Water supply
3	Wastewater treatment
4	Environmental sanitation
5	Water resources

4.1.4 LIST 4: PHASES AND THEIR PHASEIDS

PhasesID	Phases
1	Planning
2	Design
3	Implementation
4	Operation
5	Maintainance
6	Monitoring & Evaluation

5 ABOUT THE WATER & SANITATION SECTORAL COMPETENCIES DATABASE

The database is a “relational”, consisting of the following interrelated objects:

- o **Tables**
- o **Queries**
- o **Forms**
- o **Reports**
- o **Macros**

Information is captured using **Forms**, and is stored in **Tables**; all searches for information are carried out using **Queries** while **Reports** function to output the outcome of a search.

Tables are fundamental to the functions of a Access database; it is through tables that the relationship among different pieces of information is indicated. Each table consists of Fields, which contain a piece of information for each competency. This database has the following tables (Table 1):

Table 1: List of Tables and their fields available in the database.		
	Table	Available fields
1	Competencies	Competencies, Competency ID, Occupational function ID, Phases, Issues
2	Occupational functions	OFID, Occupational function, Area ID
3	Areas	Area ID, Area
4	Phases	Phase ID, Phase
5	Issues	Issue ID, Issue

6 FUNCTIONS OF THE DATABASE

The Database performs the following functions:

- o It stores a list of up-gradable **Competencies** in an easily accessible format;
- o It provides a quick way of searching for competencies relating to a particular Job in the sector;
- o Provides an easy way of entering data into the database for any of the fields listed in **Table 1** above;
- o You can print out **Reports** on different aspects of the database, such as competencies for a plant manager in the water supply sector.

7 HOW TO OPERATE THE DATABASE

The database was developed using **MS Access 2000** and operates on **Windows** platform. The procedure for operating Water & Sanitation Competencies Database is similar to that of other Windows based applications.

OPENING THE DATABASE

The simplest way is to create a **Shortcut** which can be placed on the **Desktop**.

To Create a shortcut to Competencies board

- o In **My documents**, select the filename of the database (**Competencies board**)
- o **Click** the right button on your **Mouse**;
- o Select **“Create shortcut”** from the popup **Menu**;
- o Drag the **Shortcut** to the **Desktop**)
- o **Double-clicking** on the **Shortcut** to the database opens the database.

However, you can also open the database by

- o Launching **MS Access** from the **Start** button, then Programs and clicking on MS Access.
- o Opening the Water & Sanitation Competencies Database therein saved under the filename **“Competencies Board”** .

THE MAIN SWITCHBOARD

Opening the Competencies Board database leads to the **Main Switchboard Window**, a **Menu** list that provides various entry and exit options into the database.

The Main switchboard has the following items:

ENTER DATA is used for entering data into tables using forms

VIEW COMPETENCIES allows the user to look at competencies without changing anything to them.

PRINT REPORTS allows the user to print out competencies in selected options.

EXIT DATABASE allows the user to exit the water and sanitation competencies database.

8 ENTERING DATA INTO THE DATABASE

Clicking on the **Enter data** button on the Competencies Board Menu opens a submenu shown below. This menu allows you to enter or edit information in any of the **Tables** (Table 1).

Clicking items on this menu opens Forms on which you capture info into the database.

Enter Competencies:

Opens a form for capturing information on Competencies;

Enter Phases:

This opens a form for capturing or editing “Phases”

Enter Issues:

This opens a form for capturing or editing “Issues”;

Enter Areas:

This form opens a form for entering or editing “areas”

Enter Occupational Functions:

This allows users to enter or edit information about occupational functions

When finished entering or editing data, click “Return to Main Menu” on the submenu.

9 VIEWING REPORTS

To View the various reports, Click “View Competencies” on the Main Switchboard;
From the submenu that appears, select the report that you want to view.

Clicking on “View Competencies by area and function” for example, will prompt you to Enter an
“arealD” followed by “OFID” an Occupational function”

When finished, click “Return to Main Menu” , which sends you back to the Main Switchboard.

10 PRINTING REPORTS

To Print reports:

From the Main Switchboard,
Click Print Reports;
Choose the report to print from the list.

- o Print all competencies
- o Print Competencies by areas and functions

When finished printing reports, press “Return to Main Menu” in order to Exit the submenu.

11 EXITING THE DATABASE

To Exit the Database:

Click Exit Database from the Main Switchboard.

12 CONTACT DETAILS

- o Water Research Commission
PO Box 824
Pretoria 0001
Tel 012 330 0340
- o National Community Water and Sanitation Training Institute
PO Box 3101
Sovenga 0727
015 268 3270