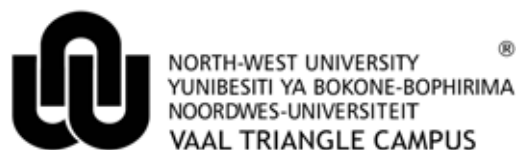


**The South African Water History Archival Repository
(SAWHAR) project at North-West University (Vaal) and a
historical overview of the Waterlit Collection**

Report to the
WATER RESEARCH COMMISSION

by

JOHANN TEMPELHOFF with a contribution by **GREY STOPFORTH**
on copyright
*South African Water History Archival Repository
North-West University, Vaal Triangle Campus*



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Water Research Commission
Private Bag X03
Gezina, 0031

orders@wrc.org.za or download from www.wrc.org.za

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Summary

This report consists of two sections. The first provides an overview of the progress made towards establishing the South African Water History Archival Repository (SAWHAR) at North-West University's Vaal campus in Vanderbijlpark. Details are provided of the organisational structure and lines of communication established with key stakeholders, such as information scientists at the University of South Africa, the National Archives Repository in Pretoria and the Water Research Commission (WRC).

Deliberations on the viability of a potential water history archive started in mid-2012 when a number of stakeholders in the water sector met with officials of the WRC in connection with research-related matters. At the time there was a need articulated for the conservation of South Africa's water heritage. Consequently a number of stakeholders were identified. These included officials in the department of water affairs (DWA), retired engineers who were former officials of the department, officials of the National Archives Repository (NAR) in Pretoria, representatives of an engineering consultancy that has done considerable research for the DWA, as well as some members of the management at the WRC.

In February 2013 a Water Dialogue sponsored by the WRC and focusing on the SAWHAR project, brought the initiative to the attention of stakeholders in the water sector and academia. There was considerable interest in proposals mooted for the establishment of an archive that made provision for the digitisation of material. Moreover, the idea was mooted that the SAWHAR initiative should become part of InterPARES, an international consortium of archival specialists with their headquarters at the University of British Columbia, in Canada.

Part of the SAWHAR project included a donation from the WRC of the Waterlit Collection (WLC) that had been developed at the Council for Scientific and Industrial Research (CSIR) between 1974 and the early 1990s. The collection was transferred from Pretoria to the library of NWU (Vaal) and ordered in a proper sequence as the first collection of SAWHAR in the first half of 2013.

Several archival collections have been donated to SAWHAR since 2012. These include a collection of documents that were substantial enough for the creation of an archive of the Standing Committee on Water and Sanitation (SCOWSAS). Other archives that started taking shape included an archive of SAWHAR itself; as well as the personal collections of material by former DWA officials and water sector researchers. An electronic collection of materials collected in South Africa by a Finnish scholar, on the country's water history, was also taken up as the first digital collection of SAWHAR.

A request by the WRC, for their documents to become part of the SAWHAR digital archive, has had a most favourable response from NWU (Vaal) and the recommendation is that attention be given to the development of a strategy to accommodate the WRC archive in the new knowledge and research commons on the campus.

In the report the need is discussed for a heuristic project aimed at collecting archival information that represents contemporary historical perspectives on water in South Africa. These sources need not necessarily be institutional in nature, but should be explorative and representative, specifically of community perspectives on the water

history of every-day life in South Africa. Much of the information will form part of indigenous and social knowledge emanating from personal historical memories and oral traditions.

At the outset of the SAWHAR project a number of concerns were articulated by senior representatives of South Africa's water sector, that much of the information on the DWA, at its Pretoria offices as well as the many regional offices of the department across South Africa, were in danger of getting lost. Members of the SAWHAR team held talks with senior officials of the NAR in connection with the storage of the government department's documents. It was evident that not all relevant materials from the department's head office had been transferred to the NAR in the twentieth century. With the exception of a few small archives, hardly any material on the department was housed at the NAR in Pretoria. The talks also pointed to the problem that the NAR did not necessarily have sufficient space to accommodate all the department's materials.

Based on deliberations with current and former officials of the DWA there is reason to believe that attention needs to be given to measures aimed at preserving a part of South Africa's water heritage as reflected in the DWA's documentation. It is recommended in the report that a research and reconnaissance team consisting of an experienced archivist, as well as an official of the department of water affairs, in collaboration with a qualified historian, visit a number of regional offices of the department of water affairs in South Africa to:

- a) Make an assessment of the department's local documentary material and how it is preserved.
- b) Compile a report on:
 - i. the condition of the documents in storage at the regional offices of the department;
 - ii. the relative importance of the available documentation;
 - iii. the need for archiving the material.
- c) Establish relations with regional offices of the National Archives Service to negotiate for the accommodation of archival material of the regional offices of the department of water affairs.

In a second phase a number of social science graduates should be appointed as officials in DWA. One requirement should be for them to have the subject of History as a major in addition to potential co-majors in Public Management, Library Science, Information Communications Technology, Political Science and/or International Politics. The graduates should also register for formal training, for example a postgraduate diploma in archival science, funded by the DWA.

Graduates of universities situated in the regions where the DWA documents are located should be encouraged to undergo a period of in-service practical training. The graduate officials should then work in close collaboration with the records department at DWA's Pretoria head office. In a second phase the officials (archivists-in-training) should be posted out to DWA's regional offices where they should begin the ordering of the regional departmental historical records under the supervision of a local records manager. The material – preferably closed files dating back at least 20 years – can then be transferred to the nearest regional branches of the national archives repository.

Ordering the records at the DWA's head office and at the regional offices, should be done in close collaboration with the relevant local or regional offices of the NAR management. In the case of the head office of DWA, the dealings will be directly with the Pretoria office of the NAR.

While ordering the hard copy archives, attention should simultaneously be given to the digitisation of the archives. It is advisable that the DWA take this responsibility. For material after 1980 there should be a significant corpus of digital documentary information available. That information should be consolidated with the assistance of officials in the respective information technology divisions.

A number of officials, preferably with a matric qualification, can be employed for the digitisation process. It is furthermore recommended that the archiving initiative in the DWA be done in the context of the InterPARES system of documentary storage with a view to potential consolidation into the larger system in the future.

In view of the fact that the objective is to develop SAWHAR as a digital archival repository, the first section of the report also deals with matters of copyright and digital documentation. While it is accepted that as an archival repository SAWHAR will focus primarily on the storage of primary documentary material for preservation and digitisation, there could be some legal implications if previously published material is copied and placed electronically at the disposal of researchers who are making use of the SAWHAR facilities. In principle the understanding is that SAWHAR is a not-for-profit initiative that aims to serve the interests of a research community in the water sector. Therefore all matters related to duplication and digitisation will be subject to the policy framework of NWU's libraries in respect of copyright rulings.

The history of the Waterlit Collection, which forms a seminal part of the SAWHAR project, is discussed in the second part of the report. The collection which is home to more than 300 000 items related to water was developed between 1974 and the early 1990s at the Council for Scientific and Industrial Research (CSIR) in Pretoria. By the 1990s the collection's catalogue was considered to be the largest of its kind in the world before its incorporation into an even larger international water database.

The historical overview of the WLC narrates the history of the manner in which a hard copy collection of materials such as the WLC was influenced by successive waves of information technology transformation. What started out as a basic collection of seminal reports, articles and postgraduate academic studies later became a collection of valuable sources, administered by as many as 400 library scientists working in different and diverse contexts. The historical discourse also makes disclosures on the way in which transformations in technology, ranging from the introduction of the personal computer alongside the institutional mainframe computer system, transformed the manner in which large amounts of data were stored. What began as storage on a CD-rom, later became part of a comprehensive catalogue that could be located and accessed on the internet.

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Section 1

The South African Water History Archival Repository (SAWHAR) project at North-West University (Vaal)

Background

Plans for the establishment of the South African Water History Archival Repository (SAWHAR) were set in motion in 2012 when the Water Research Commission (WRC) indicated that it was prepared to provide funding. Following discussions with officials of the Water Research Commission (WRC), funding was requested for the establishment of the South African Water History Archival Repository (SAWHAR).¹

In a letter to the WRC a number of reasons were listed, suggesting that there might well be a need for a water archival repository.² It became evident that:

- senior officials, managers, specialist consultants and academic researchers were concerned about the loss of institutional memory in the country's water sector;
- many senior leaders in the water sector who had recently retired, or were in the process of retirement, were in possession of valuable primary source material and considered this to be of substantial value for researchers, planners and managers interested in contemplating the future from past experience;
- there was a notable absence of inventoried primary sources on water affairs in the central and regional offices of South Africa's national archival repositories; and
- although significant contemporary electronic database archives of the WRC and the Department of Water Affairs (DWA) are accessible on the

¹. The reading experience of this report can be enhanced by listening to the song Cusco by ES Posthumus on the Album *Unearthed* (Wigshop Records, 2001). A version of the music can be located at <http://www.youtube.com/watch?v=nxndOzCw2bg>

². SAWHAR, Outgoing correspondence. File 1/2012. (OC1/2012) 20120730. J Tempelhoff – WRC, Vanderbijlpark, 2012.07.30.

internet, non-digitised material in hard copy, especially relating to the period before 1980, is rapidly becoming inaccessible.³

In a separate flier outlining a preliminary strategy and budget to begin the project, it was explained that provision had to be made for:

- a workshop for a group of stakeholders to deliberate on the project;
- appointing an archivist as a consultant to start processing the acquisitions;
- developing an IT strategy for digitising SAWHAR;
- sundry expenses for travelling to meet with stakeholders in the project and with potential donors of material.

An amount of R400 000 was suggested as an appropriate amount to begin the initiative.⁴ In August 2012 the office of Prof. AMC Theron, Dean of the Faculty of Humanities at NWU (Vaal), made available an amount of R200 000 to launch the project.⁵ The NWU institutional financial administration division subsequently opened an account that is accessed through the secretary in the School of Basic Sciences.⁶ In September 2013 the Water Research Commission also gave notice that it would make available R200 000 towards the project.⁷

Heuristics: Information collecting

Advisory board

Before the SAWHAR team started heuristic procedures, a group of information specialists and water sector/research stakeholders was invited to act as an advisory committee on data collection.⁸

The primary group comprised:

- Prof. JWN Tempelhoff (chairperson and project leader);

³. SAWHAR, Outgoing correspondence, File 1/2012, (OC1/2012) 20120730, J Tempelhoff – WRC, Vanderbijlpark, 2012.07.30.

⁴. SAWHAR, OC1/2012, 20120728, J Tempelhoff, The South African Water History Archive, 2012.07.28.

⁵. NWU (Vaal) SBW Financial file.

⁶. SAWHAR, OC1/2012, 20120817, J Tempelhoff – Ms A Muller, Financial administration, NWU (Institutional), Potchefstroom.

⁷. SAWHAR, IC, 20130911, Mrs K Motsepe, WRC – JWN Tempelhoff.

⁸. See e.g. SAWHAR, AC, 20120824, J Tempelhoff – J Ferreira, Rand Water.

- Dr Ina Gouws, an academic colleague in Political Science, who has been part of the Research Niche for the Cultural Dynamics of Water (CuDyWat) since its inception in 2005; and
- Ms Lani van Vuuren of the Water Research Commission.

Invited experts included:

- Mr Jannie Ferreira (archivist Rand Water);⁹
- Ms Celeste Reynolds (archivist NWU, Potch);
- Ms Hendra Pretorius (librarian NWU, Vaal); and
- Ms Corrie Breitenbach (librarian and IT specialist NWU, Potch).

Ms Barbi Conradie, who had shortly before retired as archivist at Standard Bank in Johannesburg was brought in as a consulting archivist. She was asked to do a presentation on a water history archival repository.¹⁰ Ms Conradie was in the process of relocating to a retirement home in KwaZulu-Natal but agreed to do the work with the intention of potentially accepting an offer to work, on contract, towards getting the project off the ground. However, she was unable to continue with the work.

SAWHAR working committee

As of February 2013 a working committee was formed, primarily consisting of:

- Prof. Johann Tempelhoff (chair and researcher)
- Dr Claudia Gouws (researcher)
- Ms Marietjie Joubert (archivist)
- Ms Mita Mokoena (student assistant)
- Ms Uandwela Rabali (student assistant)

The committee held regular meetings to deliberate on matters relating to SAWHAR.

Communication with key stakeholders

In November 2012, Prof. Tempelhoff, and Dr Claudia Gouws¹¹ visited Pretoria and held talks with representatives of three relevant stakeholders. These included information scientists at the University of South Africa (UNISA); officials at the

⁹. Mr Ferreira subsequently asked to be excused. He was unable to secure permission from the management of Rand Water to participate in the project.

¹⁰. SAWHAR, Knowledge generation on archives (KGA) 1/2012, B Conradie, "SA Water History Archival Repository" (Report for NWU, August 2012).

¹¹. Dr Gouws graduated in October 2013 with a PhD in water history at NWU (Vaal). When she joined the archival project Dr Gouws was in the final phase of completing her PhD studies.

National Archive Repository in Pretoria; and Dr Inga Jacobs, at the Water Research Commission.

Collaboration with UNISA

Prof. TB van der Walt, of the department of Information Science at the University of South Africa indicated that he would be interested in participating with SAWHAR on a project aimed at creating a digital archive. He recommended that attention be given to joining forces with InterPARES an international consortium of archival scientists operating from the University of British Columbia in Vancouver, Canada,¹² with the objective of creating digital archives that can be accommodated in Cloud data storage systems. Prof. Van der Walt was willing to support the initiative and gave the undertaking to participate in a planned session to discuss the archival project with stakeholders in 2013.¹³

Subsequently SAWHAR and UNISA collaborated with InterPARES at a Water Dialogue arranged by the WRC. This was held in Vanderbijlpark on 22 February 2013.

In terms of the existing understanding with UNISA, a SAWHAR member, Claudia Gouws, participated in a training session between 6 and 10 May 2013 in Pretoria, presented by UNISA, partnering with InterPARES.¹⁴

Johann Tempelhoff and Claudia Gouws also attended the InterPARES Africa launch at UNISA in Pretoria on 27 November 2013.

National Archives Repository, Pretoria: Archives of the Department of Water Affairs

In a November 2012 interview, Mr Gerrit Wagener, assistant director of archival collections at the National Archives Repository (NAR) in Pretoria, disclosed that the archive of the Department of Water Affairs had not yet been organised and inventoried.¹⁵

It had earlier come to the attention of the SAWHAR team that students and researchers had been given access to what was described as the 'unordered' archives of the DWA for urgent research purposes. Researchers had apparently even been

¹². See InterPARES Project, *International Research on Permanent Authentic Records in Electronic Systems* at <http://www.interpares.org/welcome.cfm> (Accessed 2013.11.22).

¹³. SAWHAR, KGA 1/2012, 20121121. C Gouws, "Samesprekinge oor samewerking met UNISA, Nasionale Argief and WNK" (November 2012).

¹⁴. SAWHAR, OC 20130423, Komiteevergadering; Also see SAWHAR, InterPARES, Folder Claudia InterPARES training April-May 2013.

¹⁵. SAWHAR, KGA 1/2012, 20121121. C Gouws, "Samesprekinge oor samewerking met UNISA, Nasionale Argief and WNK" (November 2012).

allowed to remove documentation from the repository and return it later.¹⁶ In an effort to find clarity on these issues, members of SAWHAR asked to work closely with the National Archives in the interest of safeguarding South Africa's documentary heritage on water. Mr Wagener indicated that the NAR was prepared to participate and to give its support.¹⁷

In November 2013 further talks were held to deliberate on the archives of the DWA that still needed to be accommodated in the proposed archive, as well as the potential of using existing archival material on water as part of a project linking the NAR and SAWHAR with InterPARES on a website.¹⁸

The discussion with Mr Gerrit Wagener (currently assistant director responsible for sensitive records and client services) and Ms Erna-Marie Pretorius (assistant director, records management) shed some light on the role of the NAR in dealing with records of government departments. In terms of the existing legislation no government body i.e. any legislative, executive, judicial or administrative organ of state (including a statutory body) at the national level of government, may dispose of documents without the knowledge of the national archivist.¹⁹ The law states that:

no public record under the control of a government body shall be transferred to an archives repository, destroyed, erased or otherwise disposed of without the written authorisation of the National Archivist...²⁰

Some exceptions are made in the legislation, but in essence, government archivists explained that there should be communication between the responsible government departments and the NAR staff.²¹

Both archivists were in favour of collaboration with SAWHAR and were also willing to offer advice on matters of archival procedure. They also confirmed that they had not yet accessed all the available DWA records. They gave the assurance that they

¹⁶. It subsequently became evident that the researchers had in fact consulted material on a commission of investigation, ordered and inventoried earlier. However, what remained a problem was that the material was allowed to leave the premises of the archival repository. See NAR, Pretoria, S382/K310, Lys van die komitee van ondersoek i.s. gehalte van water aan die verre Wesrand 1967-1973.

¹⁷. SAWHAR, KGA 1/2012, 20121121. C Gouws, "Samesprekinge oor samewerking met UNISA, Nasionale Argief and WNK" (November 2012).

¹⁸. SAWHAR, KGA 1/2012, 20121121. C Gouws, "Samesprekinge oor samewerking met UNISA, Nasionale Argief and WNK" (November 2012).

¹⁹. SAWHAR, NARS, 20131120, J Tempelhoff, Interview Wagener and Pretorius, National Archives Repository, Pretoria 2013.11.20.

²⁰. RSA, *National Archives and Records Service of South Africa Act*, NO. 43 of 1996, as amended by the *Cultural Laws Amendment Act*, 36 of 2001, Section 13 (Management of Public Records), subsection 2(a).

²¹. SAWHAR, NARS, 20131120, J Tempelhoff, Interview Wagener and Pretorius, National Archives Repository, Pretoria 2013.11.20.

were also aware of the importance of DWA's documentation. However there were monetary and human resource constraints on South African archives working under the auspices of the Department of Arts and Culture. As a rule, user demand determines if and when archival collections are prepared for public user access.²² The National Archives Repository in Pretoria has not in recent years experienced any significant demand for water-related materials.

At the time of the meeting we were able to locate four inventories of archives dealing with water in the Pretoria Archival Repository. These are:

- a commission report of 1950/1 dealing with proposed water legislation;²³
- a commission report of 1966/68 on water matters;²⁴
- a commission of inquiry into the quality of water on the West Rand in the period 1967 to 1973,²⁵ and
- a list of documents of the water planning commission for the Eastern Transvaal 1977 to 1979.²⁶

Water Research Commission

Talks were also held with Dr Inga Jacobs at the Water Research Commission in Pretoria. In November 2012 she indicated that they would be interested in having the filing system of the WRC digitised and recommended that this process should be extended back to 1971. The WRC has a vast amount of information. The space taken up by these documents was now required for staff office accommodation.²⁷

At the time of a later visit to the WRC, Johann Tempelhoff looked at some of the files with Inga Jacobs. Most of the material has a bearing on research projects funded by the WRC since its inception. These include the minutes of board meetings of the WRC; and administrative documentation dealing with committees responsible for overseeing research in a variety of fields in South Africa's water sector.

²². SAWHAR, NARS, 20131120, J Tempelhoff, Interview Wagener and Pretorius, National Archives Repository, Pretoria 2013.11.20.

²³. SANA, S299, K.122, Inventaris van die Sekretaris van die Kommissie van Ondersoek insake die Waterwette van die Unie van Suid-Afrika, 1950-1951 (1971).

²⁴. SANA, S311, K220, Inventaris van die Argief van die Sekretaris van die Kommissie van Ondersoek insake Wateraangeleenthede, 1966-68 (1972).

²⁵. SANA, S382, K310, Lys van die komitee van ondersoek i.s. gehalte van water aan die verre wesrand 1967-1973 (1977).

²⁶. SANA, S409, K362, Lys van die Waterbeplanningskommissie vir die Oos-Transvaal 1972-1979 (No date).

²⁷. SAWHAR, KGA 1/2012, 20121121. C Gouws, "Samesprekinge oor samewerking met UNISA, Nasionale Argief and WNK" (November 2012).

InterPARES collaboration

In February 2013 colleagues from UNISA and SAWHAR along with an InterPARES representative, held the first deliberations on collaboration.

The InterPARES representative, Mr Adam Jansen, arrived on 19 February from the United States of America. He holds a Masters degree from the Massachusetts Institute of Technology (MIT) in information science and is the recipient of a four-year fellowship in the School of Library, Archival, and Information Studies at the University of British Columbia (UBC). At the time of his visit he was the contractor in charge of digitising the State Archives of Hawaii. Previously, as a government archivist in the USA, he played a key role in the digitisation of the archives of four US state archives – among others the Archives of Washington State on which he worked for seven years.²⁸

On 20 February, accompanied by Mr Jansen, the SAWHAR team held talks in Pretoria, together with the UNISA colleagues, on a workshop to be held at North-West University's Vaal campus the next day, i.e. prior to the Water Dialogue sponsored by the Water Research Commission for stakeholders of the Department of Water Affairs (DWA) at the Emerald Casino Resort in Vanderbijlpark that was due to be held on 22 February.

On 21 February, Adam Jansen presented a colloquium for a small NWU (Vaal) audience of computer and library information specialists on archival science and the current digitisation trends. He provided an overview of the activities of InterPARES and then discussed the concept of digital archives. He explored the lifecycle of archival material (create, use, store, and dispose) and what it means to archive in the electronic age. Working from many classical principles of archival practice, he explained the need for disciplinary integration while simultaneously exploring new ways of storing and preserving documentary materials.²⁹

WRC Water Dialogue

The WRC Water Dialogue, dedicated to talking about archiving South Africa's water heritage and the current trend towards digitised archives, was held at the Emerald Casino Hotel Resort in Vanderbijlpark on 22 February 2013. More than 50 people attended the event.

Johann Tempelhoff provided an outline of the proposed SAWHAR project, explaining that the primary objective was to collect archival material that could support research, especially on the proud heritage of water in South Africa. Over and above official documentation the aim was also to retrieve cultural traditions related

²⁸. SAWHAR, KGA 1/2013, WRC 201302. Workshop, c201302, Short CV Adam Jansen.

²⁹. SAWHAR, InterPARES, 20130221. C Gouws, Notes on A Jansen, closed workshop.

to water in the country. Importantly, it was stressed that the archive had to become a digital platform that would be readily accessible by means of the internet.

InterPARES' Adam Jansen spoke about digital archives and highlighted the issues of:

- making and maintaining digital archives; and
- the preservation of records.

In the initial process of establishing an archive, decisions have to be taken on the need for the correct software and easily accessible file formats. Digital material created from hardcopy information has to remain accessible over an extended period of time (literally forever). Furthermore they have to remain stable and fixed. The digitised material also has to contain information to ensure that it is possible to determine its integrity. It is moreover essential to arrange the digital groups into logical systems. The material has to be protected from unauthorised actions and potential corruption. Trustworthiness of the digital record is of course a prime requirement.³⁰

In their presentations Prof. TB van der Walt and Ms Isabel Schellnack-Kelly outlined the salient reasons why, in the face of numerous water-related crises facing South Africa, greater attention needs to be given to developing a digital archival system. They reiterated the value of archives as a means of promoting transparency, accountability and preserving the collective memory of society. In their view, archives in the 21st century must represent a modern environment in which materials are stored under superb conditions and are made accessible in a sustainable manner. By citing examples of South Africa's water boards they explained that an archive is of significant value for water sector managers, engineers, scientists, researchers and administrators.³¹

From the questions asked and responses from the speakers, it was evident that in the water sector there is a very real need for a South African Water History Archival Repository (SAWHAR). In the ensuing discussion a number of important matters came to the fore. The opinions and suggestions underlined the following points:

- There has to be continuous accessibility to the contents of SAWHAR. This can be interpreted as a reliable internet connection to the information available at SAWHAR.
- Water history should form part of education programmes (curricula) at schools at both primary and secondary levels. In other words, there is a

³⁰. A Jansen, "Preserving records in the digital age", Paper presented at the Water Research Commission Water Dialogue, Emerald Casino Resort Hotel, Vanderbijlpark, 2013.02.22; SAWHAR, InterPARES, 20130222, C Gouws, Notes on workshop.

³¹. TB van der Walt and IS Schellnack-Kelly, "South Africa's water heritage and its future preservation: establishing a water research archive for water-related information sources". Paper presented at the Water Research Commission Water Dialogue, Emerald Casino Resort Hotel, Vanderbijlpark, 2013.02.22.

call for greater attention to water history at tertiary education institutions, featuring in under- and postgraduate university training, a matter that is already receiving attention at NWU.

- The information must be available on the internet (see above).
- There must be free access (subject to organisational supervision) to the information.³²

Public and stakeholder participation in talking about the proposed SAWHAR project proved to be a valuable point of departure and elicited significant discussion and email correspondence between researchers, potential donors and members of the SAWHAR team.

The Waterlit Collection (WLC)

In 2013, a considerable amount of time was invested on the Waterlit Collection (WLC). The history of the WLC itself is a separate project currently under way and it will therefore not be discussed extensively here.³³ Suffice to say that the collection was started at the Council for Scientific and Industrial Research (CSIR) where the National Institute for Water Research (NIWR) was established in 1958.³⁴ The institute was also instrumental in the establishment of the South African Water Information Centre (SAWIC) in the CSIR's library and information section, where provision was made in 1974/5 for the development of the Waterlit Collection – a collection of diverse publications, manuscripts, conference papers, reports, books and journals, dealing with matters related to the broad interdisciplinary field roughly outlined as water studies.³⁵

The WLC can be classified as a typical special collection. A collection of this nature consists of materials that have evolved in libraries and documentary repositories in all parts of the world. There seems to be consensus that a special collection would typically comprise 'research resources worthy of significant development', primarily at university libraries,³⁶ but also at research institutions, such as South Africa's CSIR.

³². SAWHAR, InterPARES, C Gouws, Digital recording of Water Dialogue, Emerald Casino Hotel, Vanderbijlpark, 2013.02.22.

³³. SAWHAR has received from the WRC the File Collection: WRC K6/1. Suid-Afrikaanse Navorsings Ondersteuningsdienste: Suid-Afrikaanse Inligting-sentrum vir Water.

³⁴. PJ Aucamp, *The water industry in South Africa* (South African Water Information Centre, Pretoria, 1978), p. 15.

³⁵. PJ Aucamp, *The water industry in South Africa* (South African Water Information Centre, Pretoria, 1978), p. 14.

³⁶. LJ French, "What are special collections?" in Blog: *Educator + Infonista + Historian*, 27 September 2012 at http://www.laurajfrench.com/2012_09_01_archive.html (Accessed 2013.11.24).

Transfer of WLC and unpacking

The logistics of transferring the WLC from the Water Research Commission's offices to North-West University's Vaal campus in Vanderbijlpark posed a number of problems. Originally the agreement was that the WRC would see to it that about 280 cardboard boxes (600mm x 450mm x 300mm), each weighing about 20kg, would be delivered to NWU.³⁷ By February 2013 the WRC asked SAWHAR to do the work. A Pretoria transport contractor agreed to make the delivery and by mid-March 2013 the boxes were comfortably settled in a somewhat crowded space in a library reading room. For the SAWHAR team the arrival of the WLC was a major moral boost and there was great excitement. The first project was on hand and the archivist, Marietjie Joubert, immediately took charge of unpacking and sorting the contents of the cartons.

The conundrum presenting itself was that:

- a) although the WLC was comprehensive and without doubt of vital importance for South Africa's history of water science, it was not a conventional archival collection, but a library collection; and
- b) space was at a premium in the NWU (Vaal) library where a population of more than 6 000 students use the facility daily. The existing library has been scheduled for replacement by a new library building that was scheduled for completion in late 2013.

Furthermore, the collection came without a data list of contents. Nor, apparently, was the collection sorted/ordered, although it later transpired that some sorting had taken place (see below). Ms Joubert duly began the slow process of unpacking the cardboard boxes and working systematically through each box file.

All the box files, as well as every single document in the collection, had originally been numbered. This transpired after Ms Joubert had discovered a pamphlet to the effect that the collection had been ordered according to a comprehensive thesaurus of keywords. This meant that the entire collection could be placed in a logical sequence on the available shelf space in the library.

Ms Joubert, according to a self-timing project she devised, was able to unpack 10 large cardboard containers per day and it meant that she worked through between 55 and 60 box files in one shift. All the materials were described as 'artificial' documents, suggesting in archival terminology that they were all secondary sources.³⁸

³⁷. SAWHAR, WLC 20130306, M Joubert, "Waterlit Collection and the Alen Conley collection" (March 2013).

³⁸. SAWHAR, WLC 20130316, Email correspondence: M Joubert – J Tempelhoff, 2013.03.16. Waterlit Archive.

In 44 working days, between 11 March and 6 June 2013,³⁹ Ms Joubert unpacked 274 cardboard crates and arranged 1 750 box files in numerical order. She also created a working inventory with a basic taxonomy of the types of documents in the WLC.⁴⁰

Primary description of the WLC

From Ms Joubert's assessment it was possible to determine that:

The Waterlit Collection was a set of research resources relating to the subject: 'Water'.

All items (documents) in the box files were numbered. They were further sorted into groups and into certain series from specific institutions (see below under the broad classification of the contents of the WLC). There was a comprehensive thesaurus of keywords of relevant terms. However, it was difficult to determine when and how there were deviations in the system.

It appears that the documents were originally packed systematically into the cardboard crates but that the order was disrupted in the process of storage and transportation.

In the WLC there are very few primary sources, or items that can be classified specifically as archival records.

What is evident is that the collection forms part of a core set of materials which can be used by researchers on the subject of water.

The WLC is of substantial research value to the proposed water archival repository.

The time-span of the material basically covers the period 1940–2002.

The contents were identified as primarily consisting of:

- journals, magazines, books, booklets, brochures, information pamphlets, brochures and newsletters;
- academic theses and dissertations submitted to institutions of higher learning for graduate purposes;
- research reports, studies, articles, assessments, programmes, projects, surveys, analyses and investigations;
- technical notes and reports;
- annual reports and yearbooks;
- guides and guidelines, handbooks and lectures;
- manuals, sourcebooks and strategy proposals;

³⁹ . SAWHAR, WLC 20130527, Waterlit summary of contents.

⁴⁰ . SAWHAR, WLC, 20130315 Prelim inventory; SAWHAR, WLC, 20130605 M Joubert – J Tempelhoff, 2013.06.05. Quotation for phase 2 of the Waterlit Project.

- congress, seminar and symposium papers and proceedings, and reports on workshops;
- government gazettes, bills, laws and policies;
- data lists, other lists, biographies, registers, catalogues, indexes and directories; and
- video cassettes, and a few photographs that form part of research reports.

Large series of printed materials in the collection appear to have emanated from specific institutions. These include:

- WRC research reports and related publications;
- research and project reports, technical guides, seminars and CSIR workshops;
- specific CSIR research reports (especially those under the heading: Estuaries of the Cape);
- CSIR Red Data books;
- Rand Water Board (Rand Water) research and annual reports, analyses and technical notes;
- South African National Scientific Programme reports;
- Natal Water Services Advisory Board: research and annual reports;
- technical reports from the Department of Water Affairs;
- research papers from the Institute of Water Pollution Control, South Africa;
- reports of the South African Oceanographic Research Institute;
- World Bank research reports, publications, technical papers and discussion papers;
- US Environmental Protection Agency (EPA): Environment and Technology series and Ecological Research Studies series;
- EPA water pollution control research series;
- technical bulletins, research reports, manuals, economic and technical reviews, annual reports and scientific reports from Environment Canada;
- water supply geological surveys from the US Department of the Interior;
- technical papers of the US Army Coastal Engineering Research Centre;
- research and project reports, manuals and technical papers from the World Health Organisation (WHO);

- technical papers, research publications and conference papers of the Australian Water Resources Council.⁴¹

Grouping the documents

In a second phase, beginning on 3 July 2013, the box files were sorted and organised into groups using the existing primary codes: PAM, B, C, D, and W. At the time, it was uncertain if these codes had been allocated by information specialists at the CSIR, Rhodes University, or the WRC, where the WLC had been held before being transferred to NWU (Vaal).⁴²

The search for a list of contents

The SAWHAR team was aware from the outset that all the titles in the WLC had at one point in time been listed on the websites of SABINET and later also on the international databases of EBSCO.⁴³ Currently Waterlit forms part of Waters & Oceans Worldwide, a database that covers a wide array of international research in the field of water. The database has more than 1,8 million citations and abstracts dating back to the 1970s and it is said to be an essential resource ‘for those dealing with all aspects of water and water-related subjects’.⁴⁴

For the SAWHAR team the problem was that it was virtually impossible, based on the document number, to find a single source in the electronic catalogue that could be located in the hard copy collection. The research team then communicated with officials at the WRC and also those at the CSIR, specifically retired researchers⁴⁵ who had been involved with the project, in an effort to locate more information on a hard copy or electronic catalogue.

As the ordering of the physical collection gained momentum there was a growing need to have more details on the titles. At one stage a miniature scanner was ordered from Israel to experiment with the compilation of a useful data list.⁴⁶ This did not solve the problem.

⁴¹. SAWHAR, WLC 20130527, M Joubert, “Waterlit collection: summary of contents” (2013.05.27).

⁴². SAWHAR, WLC 20130706, M Joubert.

⁴³. SAWHAR, WLC 20130705, Email correspondence: R Sutton – J Tempelhoff, 2013.05.07.

⁴⁴. EBSCOhost, *Waters & Oceans worldwide*, at <http://ehis.ebscohost.com.nwulib.nwu.ac.za/ehost/search/advanced?sid=5b0fa036-ee3a-4ee2-9f00-5a63c10eee85%40sessionmgr4&vid=2&hid=115> (Accessed 2013.11.17).

⁴⁵. SAWHAR, WLC 20130703, Tina James, Pretoria (Audionote interview); SAWHAR, WLC 20130709, P Aucamp, Pretoria (Audionote interview).

⁴⁶. SAWHAR, OC 20130423, Komiteevergadering.

Members of the research group then explored a number of websites, but could not gain access to anything that significantly linked NWU (Vaal)'s WLC with the EBSCO database. The web-based database displayed no document numbers.

A number of telephone calls were made to various librarians at the CSIR. Names were secured of people who could perhaps provide the relevant information. Eventually, the research group received a catalogue that had been on one of the old servers at the CSIR.⁴⁷ The problem was that this catalogue was incomplete. It listed only 78 278 titles dealing with the period from 1992 to about 1998.⁴⁸ The research team was aware that there had to be more than 300 000 titles. Unfortunately this catalogue, the first electronic catalogue that surfaced, was also only a partial lead.

The research team then managed to secure a set of files at the offices of the WRC. These files deal with the administration, management and finances of the WLC.⁴⁹ Comprising five volumes, they were classified under the rubric 'Research Support Services' at the South African Water Information Centre (SAWIC), and referred to the period between 1982 and 2002.⁵⁰

It was discovered that between 1975 and 1992 the WLC database was stored in a mainframe computer system (IBM370/158) at the CSIR. However, as of 1988, in view of the global shift towards personal computer system software, information became available on the DOS system. This operating system was used for personal computers running on floppy discs. In 1993 the WLC information scientists transferred the database to a CD-rom after an agreement had been concluded between the SAWIC and Compact Cambridge, a company based in the USA. In the same year Compact Cambridge was absorbed into SilverPlatter International, another company specialising in database distribution. By this time, SilverPlatter already controlled the databases of Aquatic Sciences and Fisheries Abstracts.

The contract agreement between SAWIC and SilverPlatter was not exclusive and in 1993 another agreement was concluded with the NISC Corporation in the USA for Waterlit data to be combined with Canada's Aquaref and Delft Hydro, which is based in the Netherlands. In 1996 the name was changed to Water Resources Worldwide.⁵¹ At one point in time the WLC was given to Rhodes University where the JLB Smith Institute linked the WLC with a host of other water-related database groups. That part of the history of the WLC should also be in the files secured from the WRC.

⁴⁷. SAWHAR, WLC, 2013 06-07 Catalogue search diary (2013.06.19-2013.07.05).

⁴⁸. SAWHAR, WLC, 20130604. CSIR electronic database of WLC.

⁴⁹. The files still have to be inventoried, but have provisionally been named, based on the existing system of the WRC, as WRC K6/1. Volumes 1-5.

⁵⁰. SAWHAR, WRC, K6/1/0/1 Navorsingsondersteuningsdienste: Suid-Afrikaanse Inligtingsentrum vir Water Vergaderings, Vols. 1-5.

⁵¹. SAWHAR, WRC, K6/1/0/1, Vol. 2, Minutes of a meeting of the Steering Committee: project Waterlit database development, 1999.08.06. File 5/99. Anon., "Waterlit – past, present and future: overview of a unique South African product", pp. 3-4.

In August 2013 a copy of the SilverPlatter CD-rom was located at the Ferdinand Postma NWU library in Potchefstroom. On this system there were no links to the physical documents of the WLC. The list does however contain upwards of 300 000 source references.

An important finding by members of the SAWHAR team was that there are numerous items in the WLC that are not yet digitised. This was evident from searches on the websites of journals, libraries and lists of published theses and dissertations as well as EBSCO's database, Waters & Oceans Worldwide.

The WLC as a special collection

Key questions⁵² that should be posed when consideration is given to the creation of a special collection are:

1. What are the current strengths and scope of the collection?
2. What are the 'high spots' and what supports research/teaching at the relevant institution?
3. Is the collection unique?
4. How does the collection fulfil the mission of the institution?
5. Are there similar collections which will increase research potential?
6. Are there possibilities to acquire complementary materials and resources?

Responses to these questions are summarised briefly below.

1. **Current strength and scope of the collection:** The WLC is a collection of more than 300 000 items that were used extensively by the water research community in South Africa in the period 1974 to about 2002 in a transitional phase of IT development in South African libraries. The physical collection, as it is at present, is a historically 'frozen' assembly of material that can be linked up with related existing electronic materials in water studies, locally as well as internationally.
2. **'High spots' and support for research/teaching at NWU:** The collection, because of its comprehensive nature, has 'high spot' source materials which are particularly useful to natural science researchers. Researchers can form an impression of the foundations of water research in South Africa and the sources consulted by leading water researchers

⁵². LJ French, "What are special collections?" in Blog: *Educator + Infonista + Historian*, 27 September 2012 at http://www.laurajfrench.com/2012_09_01_archive.html (Accessed 2013.11.24).

from the 1970s, when South Africa's water research made marked headway.

3. **A unique collection:** The collection is unique in the sense that it was compiled at a time when South Africa was politically isolated as a result of its racially-based policies in the apartheid era. Nevertheless, water researchers and information scientists were able to construct, until WLCs absorption into other databases, one of the most comprehensive international collections on water studies.
4. **WLC and the mission of NWU's SAWHAR:** North-West University's Vaal campus management has made a firm commitment to the SAWHAR project. The WLC is a cornerstone of the project. Water studies research is currently a growing field of investigation at all campuses of North-West University. The mission of SAWHAR is typically to work towards providing a service to researchers in the water sector. However, because of the valuable historical information contained in the WLC, it is also compliant with the objective of SAWHAR of aspiring to preserve the country's water research heritage.
5. **Similar collections:** There are collections of water research documents, especially those of the Water Research Commission, that are electronically accessible. Many libraries also have comprehensive, but separate, book and journal collections. The WLC is unique in the sense that it is a truly interdisciplinary collection of materials assembled for use by researchers in the field of water studies. Given the fact that there is an increasing trend towards digitisation, the WLC can easily be interfaced with related research materials, for example at the DWA, CSIR and other universities in South Africa.
6. **Complementary materials and resources:** The SAWHAR project is aimed at developing an archival collection of source materials with a strong focus on digitisation. The WLC will be a treasure trove of secondary source materials. These are compatible with archival sources that typically comprise primary source material. Furthermore, the collection will complement other resources such as audiovisual material that will also form part of the archive.

Training of SAWHAR team members

Considerable effort was made to provide learning-in-practice experience for participants in the SAWHAR project.

Ms Marietjie Joubert, who joined the SAWHAR project at the beginning of 2013, is an experienced museumologist with many years of experience as a heritage expert and curator of municipal museums in the Gauteng Province of South Africa. In recent years she also branched into working on archive material and was responsible for ordering the archives of the Emfuleni Local Municipality's Vaal Teknorama Museum. In 2013 she registered for a postgraduate qualification in archival studies at the University of South Africa. She completed her studies at the end of 2013.

From the outset there was consensus in the research group that SAWHAR would be aligned with the NWU institutional archival system that has been developed at the

archive of NWU (Potch). Consequently Ms Joubert has communicated extensively with Ms Annette Kellner and Ms Celesté Reynolds at the NWU (Potch) archive.

Dr Claudia Gouws, who completed her PhD studies in water history in 2013, has been active in the SAWHAR research group since the beginning of 2013. She participated in an InterPARES training session at the University of South Africa in May 2013.

Ms Mita Mokoena, a Masters student in Water Studies at NWU (Vaal) joined the group early in 2013, but she had to withdraw after taking ill with a virus infection that affected her eyesight. She will hopefully be able to resume work in the team in 2014.

Ms Uandwela Rabali, a Masters student in Water Studies at NWU (Vaal) also joined the research group in the second semester of 2013.

For the student SAWHAR team members the opportunity to work in the system should make them familiar with the material. This, in turn will prove beneficial for their personal research work.

On 19 and 20 August 2013, Claudia Gouws, Marietjie Joubert, Uandwela Rabali and Johann Tempelhoff attended a heritage digitisation workshop at the NWU (Potch) archive, presented by ETHER, an IT-based archival initiative under the guidance of Mr Roger Layton who is well known in South Africa as an IT specialist in the heritage sector. Mr Layton, a former IT lecturer at the University of the Witwatersrand, has been involved since the late-1990s in advising the government on heritage policy, specifically in the field of developing a digitisation programme in the heritage sector of the country.

In the South African heritage sector ETHER currently provides a viable support and advisory service for archival digitisation on a national basis. Since the beginning of the year it has been part of countrywide deliberations among archivists employed by state, and by semi-state repositories. Archivists at universities, municipalities and private institutions have also been part of the discussions.⁵³

In short: following the trends currently observed in the European Union (EU),⁵⁴ the United Kingdom and the USA,⁵⁵ there is a growing need for the digitisation of heritage – specifically related to material in archival repositories. In the near future digitisation may well be a requirement specified by government to all its departments

⁵³. SAWHAR, KGA, 20130824 ETHER workshop. J Tempelhoff, Prof. L du Plessis, vice-rector NWU (Vaal), and Ms E Steyn, campus registrar, NWU (Vaal), 2013.08.24.

⁵⁴. See European Union (EU), *Europeana* at <http://www.europeana.eu/portal/> (Accessed 2013.11.24).

⁵⁵. See, for example The Internet Archive: digital library of free books, movies, music and wayback machines at [encrypted connection] archive.org.

and related institutions (such as universities),⁵⁶ for the conservation of the country's heritage and greater accessibility for researchers and other interested persons to the relevant documentation and resources.⁵⁷ The National Research Foundation (NRF) in collaboration with the Carnegie Corporation of New York, conducted an audit on South African digitisation initiatives and recommended that amongst others the departments of science and technology; and those of arts and culture, give close attention to digitisation for the more effective dissemination and use of heritage and research knowledge.⁵⁸

Currently SAWHAR has frequent contact with ETHER. Members of the group have taken note of training opportunities that will be made available in 2014.

There were also deliberations with Ms Petria de Vaal Marais, a professional archivist who conducts training sessions in many parts of South Africa. The training is costly, but is of value to new workers in the archival sector who still have to undergo professional training in the field. This training will be also be open to outside participants.

Digital technology for SAWHAR

In 2013 attention was given to the acquisition of technology for the digitisation of SAWHAR hardcopy materials. Based on information and discussions at the ETHER digitisation workshop, consideration was given to specific equipment.⁵⁹ Essentially, two types of digital scanning technology are necessary for the archive. They are:

1. 1 x A4-size form-feed scanner; and
2. 1 x Prisma scanner for book scanning.

A form-feed scanner⁶⁰ can be used for scanning basic A4 loose sets of documents. One machine is already in operation on the NWU (Potch) campus. It is capable of carrying a substantially large workload.⁶¹

⁵⁶. SAWHAR, KGA, 20130824, ETHER workshop. J Tempelhoff, Prof. L du Plessis, vice-rector NWU (Vaal), and Ms E Steyn, campus registrar, NWU (Vaal), 2013.08.24.

⁵⁷. SAWHAR, Digitisation, 20130819-20. ETHER digitisation workshop. Copy of Department of Arts and Culture (DAC), National policy on the digitisation of heritage resources. (Final draft for public review August 2010, Version 8.) The policy is still subject to approval by the national legislature.

⁵⁸. R Page-Shipp, An audit of South African digitisation initiatives: ongoing and planned (National Research Foundation, Pretoria, 2011).

⁵⁹. SAWHAR, Digitisation, 20130819-20. ETHER: Hand-outs, 7. Scanners and cameras.

⁶⁰. Epson is considered a reputable and reliable manufacturer. See EPSON workforce DS-7500 scanner at <http://www.epson.co.za/za/en/viewcon/corporatesite/products/mainunits/overview/10878> (Accessed 2013.11.25).

For the purposes of scanning items in the WLC, the Prisma scanner is considered a viable option. The scanner is a multi-purpose device that can scan pages of up to A3 size. In view of the significant cost (about €25 000) the objective is to use the scanner in such a manner that it is accessible to all the NWU campus and institutional archival repositories.⁶² Also, the device must be put to use as effectively as possible for research and teaching purposes. SAWHAR submitted a formal request for funding for 2014 to the NWU (Vaal) campus management in this regard.⁶³ Funding support was also requested in the form of a research application to the National Research Foundation (NRF) in October/November 2013.⁶⁴

Software options

At an early stage the SAWHAR team gave attention to working within the InterPARES system. This software is free and highly effective. At NWU's Potchefstroom campus the archivists have resorted to using DSpace, a basic system software primarily intended for library sciences. They did, however, find it feasible and worth the effort to make their digitisation plans within this framework because of the in-house availability of IT-expertise and the benefit of conforming to a unitary system.

Members of SAWHAR also searched the web for other software specifically designed for archives. They were interested in locating software that could be used for creating a virtual museum in an archival system – similar to what has been done on the EU's Europeana platform.

In November 2013, archivists from several South African repositories met with representatives of the International Council of Archives (ICA) which held demonstrations of version 2.0 of the ATOM free archival software.⁶⁵ The ICA supports the new system. The archives of the Nelson Mandela Foundation as well as the Desmond Tutu archival collection have already used earlier versions of this software. Based on the fact that the ICA has given its stamp of approval to the system, there was blanket support among South African archivists for the new and much more user-friendly freeware. In fact, the NAIRS system used by the National Archival Information Repository of South Africa will soon migrate to the ATOM 2.0 platform. Furthermore, NWU's Potchefstroom archival repository is gearing to

⁶¹. Telephone discussion with Ms Celesté Reynolds NWU (Potch) archive, 2013.11.21.

⁶². SAWHAR, Digitisation. ETHER, The Ether initiative quotation, September 2013.

⁶³. SAWHAR, OC, 20131014. JWN Tempelhoff – Prof. L du Plessis, Strategic funding request: SAWHAR – Waterlit digitisation.

⁶⁴. Tempelhoff Personal Archive (TPA), Navorsingsadmin 2013: NRF 2013-4, 20131004, Copy Fin NRF Online submission.

⁶⁵. For more on the ICA see ICA.org, *International Council on Archives* at <http://www.ica.org/3/homepage/home.html> (Accessed 2013.11.25).

accept the new system once they have concluded discussions with the university's IT division.⁶⁶

There have been deliberations with the School for Information Technology at NWU (Vaal) for postgraduate student participation in planning and executing the SAWHAR digitisation project. These talks will be resumed in early 2014, once the SAWHAR has settled into the new library building.

Following deliberations with colleagues at the University of South Africa in November 2013, it is recommended that SAWHAR engage with the InterPARES Phase 3 Trust Thrust. Part of the programme entails building up an African chapter of the InterPARES consortium. NWU's SAWHAR initiative can thereby become part of a project which has substantial merit.⁶⁷

The new NWU (Vaal) library building

SAWHAR will be housed in the NWU (Vaal) library in Vanderbijlpark. The campus is situated on the banks of the Vaal River with a 3km riverfront. When the campus was relocated from central Vanderbijlpark in 1983, the name of the university was still the Potchefstroomse Universiteit vir Christelike Hoër Onderwys (PUCHO). Traditionally, the students at the Vanderbijlpark campus were called 'Pukke' a nickname, much the same as that of the Maties (University of Stellenbosch), Ikeys (University of Cape Town), Kovies (University of the Free State) and Tukkies (University of Pretoria). However, once the Vanderbijlpark campus had settled down in its new location on the banks of the Vaal River, members of staff and students alike began calling themselves the 'Watunis', suggesting that they were part of the Vaal Triangle's 'Water University'. Despite the name change to the North-West University, the name 'Watuni' still resonates, especially with some NWU (Vaal) alumni. It therefore seems fitting that in the spirit of the university being aware of its unique location on the banks of the Vaal River, there should also be space in its library for an archive dedicated to water.⁶⁸

The new NWU Vaal knowledge and research commons was officially taken into use on 6 March 2014.

⁶⁶. SAWHAR, NARS, 20131120, J Tempelhoff, Interview Wagener and Pretorius, National Archives Repository, Pretoria 2013.11.20; Telephone conversation Johann Tempelhoff – Celesté Reynolds, 2013.11.21.

⁶⁷. See JWN Tempelhoff and G Stopforth, Consolidating SAWHAR: locating sources, developing hard copy/digital archives and matters of copyright, (WRC Project 1032 of 2013/14, Version 1.3, Vanderbijlpark), pp. 10-12.

⁶⁸. P de Klerk and PL Möller, "Ontstaan en ontwikkeling van die Vaaldriehoekcampus" in ES van Eeden, ed., *In U lig: Die Pu vir CHO van selfstandigwording tot samesmelting, 1951-2004*, (Noordwes-Universiteit, Potchefstroom, 2006), pp. 443-484.

The SAWHAR archives

In addition to the WLC, SAWHAR currently has a number of other archival collections.

Digital archives

SAWHAR AOTA digital archive⁶⁹

This is an electronic collection of documents dealing with the operations of SAWHAR that has been developed and was used for the compilation of this report. It is a basic archive aimed at keeping track of the administration of SAWHAR. Correspondence, minutes of meetings, acquisitions and knowledge-based information on archives, along with some of the digital content of archival collections, form part of the AOTA at this point in time.

Experimental heuristic case studies

A number of projects were identified as case studies to promote a better understanding of organising and arranging the archives of SAWHAR.

The SCOWSAS archive

Dr Victor Munnik, a former policy researcher at Mvula Trust, and currently a private consultant in the water sector, donated a set of documents to SAWHAR in early 2013. He assembled this random collection of documents while he was employed at Mvula Trust. The content deals largely with the Standing Committee on Water Supply and Sanitation (SCOWSAS), an extra-parliamentary forum established in 1992. Much of the work by SCOWSAS before 1994 made it possible for the DWA to become one of the first government departments to be up and running after the country's multiracial democratic elections in 1994.⁷⁰

In the course of 2013 the need was identified to undertake a single case study to form an impression of the nature of SAWHAR's future activities. It is accepted that apart from the preservation of documentary materials, a significant amount of time and energy will have to be dedicated to ordering collections of documents and related materials into archival collections. Therefore, once the basic organisation of the WLC was completed, the archivist, Ms Marietjie Joubert, began ordering the SCOWSAS collection. The documents arrived in a number of medium-sized cardboard boxes. Although much of the material could be classified as primary sources, they were all in printed format. No hand-written documents formed part of the collection – an

⁶⁹. SAWHAR, Digital archive, 1/2012-3, Archive of the Archive (AOTA).

⁷⁰. K Eales, "Water services in South Africa", in B Schreiner and R Hassan (eds), *Transforming water management in South Africa: designing and implementing a new policy framework* (Springer Science + Business Media, Dordrecht, Heidelberg, London and New York, 2011) p. 40.

evolving trait in archival collections since the advent of the personal computer in the 1980s.

Ms Joubert ordered the collection and placed the documents in box file containers extending over 0,75m of shelf space. By November 2013 an elementary inventory had been created of the collection and it was possible to form an impression of the workings of SCOWSAS, a committee that laid the groundwork for the transformation of South Africa's water sector in the early 1990s, some time before the formal transition to a multiracial dispensation in April 1994.

At the end of November the SCOWSAS collection was transferred to Potchefstroom where Ms Celesté Reynolds, the NWU archivist and her assistants started re-working the archive. The material had to be sifted again to eliminate duplication. There was also an extensive re-evaluation to ensure that the essential content of the material maintained cohesion in the new format.

ABBYY Adobe Acrobat Pro XI software was used on an EPSON Workforce DS 70 000 Multi scanner with an automatic feeder, up to size A3. All the material was scanned at 300 dpi (in colour). In total 3372 A4 pages were scanned, using 366,13MB of disc space.⁷¹

The time spent on re-ordering and scanning the collection amounted to about 100 hours. If this process is included in the so-called preparation phase for the digitisation of an archival collection, every single document scanned required at least 1,8 minutes of preparation.

A set of guidelines had to be determined to expedite the process of preparation, ordering, thinning out, and scanning the documentation in the collection. For example there had to be direction on the particular way faxed documents were scanned and ordered. There were also many duplicate copies of documents. Whereas duplicates serve a purpose in a hard copy collection, the 'bookmark function' of the duplicate falls by the wayside. It becomes merely another duplicate in an electronic search process. At most, two copies of each document should be kept in storage (because of space constraints). The one should be a 'working copy' while the second is held over as the prime source.⁷²

The original inventory created for the SCOWSAS archive was in a Word format document. This was changed to an Excel format file, making it easier to conduct checks. The whole collection, in the process of being re-ordered and digitised, underwent three sets of checks for accuracy and quality.

The lessons SAWHAR learnt from ordering the SCOWSAS collection were:

- ensure that the records are described properly;

⁷¹ . SAWHAR, SCOWSAS, Report: digitalisering verslag, SCOWSAS 1/1-1/4, C Reynolds, NWU Argivaris, Potchefstroom, 2014.01.22.

⁷² . SAWHAR, SCOWSAS, digitalisering verslag, SCOWSAS 1/1-1/4, C Reynolds, NWU Argivaris, Potchefstroom, 2014.01.22.

- make sure they are posted in the correct order; and
- all materials must be returned physically to the collection after they have been scanned.⁷³

It is estimated that the cost of ordering and scanning the SCOWSAS collection was about R17 000 and R34 000 respectively. However, because SAWHAR forms part of the NWU archival repositories, the service was performed free of charge.⁷⁴ The original ordering process conducted by Ms Joubert required about 40 hours. Ordering the SCOWSAS archive can therefore be estimated to have taken at least 150 hours for completion.⁷⁵

The Harri Mäki archive

Dr Harri Mäki spent a year (2009) in South Africa as a post-doctoral fellow at NWU. He completed his doctoral thesis in 2008 on South African water history.⁷⁶ He is currently still conducting research in the field of water studies. He has made available to SAWHAR a number of the documents he personally collected and scanned over an extended period of research undertaken in South Africa.⁷⁷ The archive comprises a significant collection of valuable secondary sources covering the period from 1840 to 1920. This archive is valuable for researchers working in the field of the water history of urban South Africa in the nineteenth and early twentieth century.

These records were all transferred electronically over the internet with the use of Dropbox. In December 2013/January 2014, Johann Tempelhoff will be visiting the University of Tampere (where Dr Mäki is based) and will use the opportunity to check and collate the SAWHAR Harri Mäki collection with that held personally by Dr Mäki.

Personal archival collections

From preliminary discussions and explorations it is evident that there is a considerable amount of valuable archival material which can be acquired from water professionals.

⁷³ . SAWHAR, SCOWSAS, digitalisering verslag, SCOWSAS 1/1-1/4, C Reynolds, NWU Argivaris, Potchefstroom, 2014.01.22.

⁷⁴ . SAWHAR, SCOWSAS, digitalisering verslag, SCOWSAS 1/1-1/4, C Reynolds, NWU Argivaris, Potchefstroom, 2014.01.22.

⁷⁵ . One archivist (initial ordering) = 100 hours; 2 archivists (final ordering and digitisation) x 50 hours = 100 hours.

⁷⁶ . H Mäki, Water, sanitation and health: the development of the environmental services in four South African cities, 1840-1920 (Juvenes Print, Tampere, Finland, 2008).

⁷⁷ . SAWHAR, DA 1/2013, Härrri Mäki Archive (HMA).

However, a major problem experienced with material held personally by researchers is that more often than not they contain very little primary source material. Most of these collections comprise books, reports, magazines and other items that would ideally be more appropriate in a library collection.

Thus far it has been impossible to begin organising personal archival collections because of the limited available space in the old library. But from mid-November 2013 the shift to the new NWU (Vaal) library began and sufficient space will be available for the archivist to organise and order these collections.

Much of the material received needs to be weeded out.

The Will Alexander archive

Prof. Will Alexander worked for many years as civil engineer in the Department of Water Affairs. After his retirement from the civil service he joined the academic staff at the University of Pretoria, before he finally retired in about 2000. In preliminary talks with a staff member of the WRC, Prof. Alexander indicated that he would be prepared to donate a significant portion of his archival material to SAWHAR. On 25 July 2012 an initial interview was held with him. A second meeting took place two weeks later. On both occasions Prof. Alexander handed over a number of personal documents. Amongst others there is a collection of notebooks he used to write draft copies and research notes on a weekly email he distributed to several hundred interested water researchers in South Africa and overseas. SAWHAR also secured a number of digital documents that were digitised for him by the Faculty of Engineering at the University of Pretoria.

This material was transferred to the Potchefstroom campus of NWU in February 2014, where it is currently in the process of being ordered and turned into a hardcopy archive, with a view to digitisation in a final phase.

The collection should cover about 4 metres of shelf space.

Alan Conley collection

Mr Alan Conley, a well-known retired engineer, informed SAWHAR in 2012, through the offices of the WRC's Lani van Vuuren, that he would be willing to part with his documents, collected over many years as a senior management official at the DWA. Marietjie Joubert visited him on 5 March 2013 and made an assessment of Mr Conley's collection. The collection is estimated to be about 5m² comprising information dated between 1910 and 2000.⁷⁸ Subsequently, Johann Tempelhoff conducted an interview with Mr Conley. In addition to being one of the leading engineers at the DWA in the 1980s he was editor/author of a major work on the

⁷⁸. SAWHAR, PA, 03/2013. Conley, 20130306, M Joubert, "Waterlit Collection and the Alen Conley collection" (March 2013).

DWA.⁷⁹ Members of the SAWHAR team held an interview with him in which he provided an outline of his career as a water engineer.

On 30 July 2013, Claudia Gouws, Marietjie Joubert, Uandwela Rabali and Gustaf Tempelhoff visited Mr Conley at his home in Pretoria and collected the first of two loads of documents of the Conley collection. A further consignment was transferred to Vanderbijlpark in September 2013.

In early November 2013 Mr Conley informed the research group that he would complete the sifting of the remaining 30 percent of the material for the group to collect.

At the time of the 30 July visit, Claudia Gouws conducted an interview with Mr Conley.⁸⁰ An edited version of the interview recording will be prepared as a podcast to accompany the posting of the archive on the website once it has been finalised.

By the end of February about 75 per cent of the collection had been collected from the donor's residence in Pretoria.

The Peter Ashton collection

Dr Peter Ashton, who retired in September 2012 from South Africa's Council for Scientific and Industrial Research (CSIR), indicated in 2013 that he was prepared to donate some of the material he had accumulated during a long career at this institution.

On 27 February 2014 Johann Tempelhoff and Martin Ginster, a senior researcher of CuDyWat, spent a day interviewing Dr Ashton. He indicated that once he started sorting out his materials he was sure there would be documents he would gladly donate to SAWHAR. At the time of the interview he provided SAWHAR with some 200 electronic copies of articles and reports he had written over a period spanning 37 years as water researcher at the CSIR in Pretoria.⁸¹

The Hugo Hiddema collection

In August 2013 Mr Hugo Hiddema informed Johann Tempelhoff that he would be retiring from the Trans-Caledon Transfer Authority (TCTA) as a legal specialist. Before joining the authority responsible for the Lesotho Highlands Water Project (LHWP), Mr Hiddema worked at the DWA for 25 years. He currently lives near Mossel Bay and indicated that if he visited Gauteng in the near future he would make

⁷⁹. Department of Water Affairs, *Management of the water resources of South Africa* (Department of Water Affairs, Pretoria, 1986).

⁸⁰. SAWHAR, PA, Podcasts, 20130730, A Conley interview MP3.

⁸¹. SAWHAR, PA Pete Ashton Archive. TOA 20140227, Digital recording and notes interview P. Ashton, 602 Flax Street, Garsfontein Extension 6, Pretoria.

an appointment to discuss his collection of documents, many dealing with the Lesotho Highlands Water Project, which he agreed to hand over to SAWHAR.⁸²

The way forward: ordering the personal archives

The SAWHAR team is currently working on a strategy of outsourcing the development of the personal archives to students as contractors to operate under the supervision of the NWU's archivists. The archivists exercise great care in overseeing this process and regularly conduct relevant checks. Once a collection has the stamp of approval from the archivist it will be scanned for digitisation. In this way students gain insight into the information that is available in the various collections. This awareness and familiarity with the content may well guide the students in their decision to conduct research for subsequent postgraduate studies.

Currently (2014) two students who completed their BA studies with History as major in 2013, have been identified to work as contractors. They will work under the strict supervision of the NWU archivists.

Business archives: AECOM archives

At the WRC's Water Dialogue on SAWHAR, Mr Abri Vermeulen an engineer employed by the consulting firm AECOM (Pretoria) communicated with the researchers. Mr Vermeulen, a former DWA engineer, was concerned about the prospect of losing valuable information on South Africa's water sector.⁸³ Later in the year he contacted SAWHAR saying that he had communicated with the management of AECOM, which was planning to move to an open-plan office system. The company, formerly the well-known consulting engineering firm BKS, now wanted to dispose of many of its hard copy materials of projects undertaken for the DWA over the years. They were also interested in digitising the material.

Mr Vermeulen facilitated a meeting with Mr Johan Rossouw, one of the long-serving consulting engineers at AECOM. In October 2013, SAWHAR was once again invited over for talks at AECOM's Hatfield offices. We had telephoned Mr Vermeulen previously and told him that in terms of the guidelines and forms compiled for the NWU (Potch) archive, SAWHAR has very simple contractual arrangements with donors.

We explained to the AECOM group that we had their interests as an engineering company at heart, as well as those of the DWA, for whom they had worked as consultants. Subsequently we submitted our basic agreement to one of the legal

⁸². SAWHAR, PA, H Hiddema, 20130825, Notes of telephone conversation: J Tempelhoff – H Hiddema, 2013.08.25.

⁸³. Mr Vermeulen donated a number of electronic sources of reports and guidelines of the DWA that he had co-authored. These sources no longer are readily available. See SAWHAR, PA, Abri Vermeulen.

advisors of AECOM for scrutiny. It was felt that this agreement would serve the interests of AECOM as well as those of NWU's SAWHAR and the potential users.⁸⁴

In subsequent communications with Mr Vermeulen we reached consensus on the fact that AECOM was a consultant working for the DWA. In principle the materials the company had in its possession belonged to the state and was by implication also the property of the people of South Africa, who had a right of access to the material. We asked the company to consider the matter and said we would then pursue it further.

The AECOM study is valuable for SAWHAR in that it makes the team aware of the importance of the respect and mutual support between the donor and recipient of valuable information. These dealings will hopefully in future enable SAWHAR to communicate effectively in this regard and collect materials from other consulting firms in the South African water sector.

Institutional archives: Water Research Commission

During deliberations with stakeholders in the water sector the matter of the documents of the WRC also came up for discussion. There currently exists a need for the digitisation of the WRC's records, dating back to the early 1970s. A senior manager of the WRC asked the SAWHAR team to give attention to the potential for the digitisation of the WRC materials. The matter has been discussed with member of NWU's Vaal campus management and there is significant interest in a venture of this nature.

In view of the fact that the WRC will be relocating to a new building in the near future, there is a sense of urgency in making work of creating a digital storage facility for the early material of the institution.

At the same time there exists at NWU(Vaal) an interest in developing an archival facility that can serve in the needs of a growing community of researchers in the field of water studies. The addition of the WRC archive top SAWHAR can make a significant contribution to the preservation of South Africa's water science history.

It is therefore recommended that special attention be given to the WRC project.

Heuristics and the need for special water-related material

Collecting information has been relatively easy. A number of private collections were donated, or are in the process of being donated to SAWHAR. Since 2012 materials in varying quantities have been received from a number of donors, all involved in a variety of ways in South Africa's water sector, predominantly in the twentieth century.

⁸⁴. SAWHAR, Consult archives, Donor AECOM. Correspondence: J Tempelhoff – B Schröder, AECOM, 2013.10.31.

While SAWHAR is intended primarily as an archival repository dedicated to the history of water in South Africa, there is a need to take care of striking a balance between materials from the formal sector (i.e. official documents) and materials that emanate from South Africans at large. In other words there is a need for material that enables water researchers to explore the dynamics of ordinary people interacting with water in a variety of ways – especially in everyday life.

This shift in emphasis is vital because much of the information we have on South Africa's political and administrative history for the greater part of the last 300 years has been ordered into archives that reflect the governance of a colonial state. South Africa has a long tradition of parliamentary government. The introduction of colonial governance, in the latter part of the Dutch era in the 17th century, and also that of the British after 1806, paved the way for a European-style (so-called Westminster system) of representative government, based on the principles of democracy, but excluding people of colour.

Therefore, government archives that evolved were representative of the contemporary systems of exclusionary democracy from which the voices of most indigenous communities, by far the majority of South Africans, were excluded. It is those voices, especially the views of people outside the perimeters of colonial, or early republican governance that must be located. Much of that information will be seated in indigenous knowledge systems and customs related to systems of governance firmly rooted in pre-colonial times.

Even in the times before the advent of multiracial democracy in 1994, South African society came to understand what democracy was all about. Even disempowered South Africans were exposed to an internal sense of democracy when they made decisions on how they wanted the country to be governed in the future. The idea of democracy was an inspiration and it kept the flame of hope alive; it spurred them on in the struggle to attain their freedom.

Runciman, in a recent global history of the twentieth century, discusses how democratic systems of governance have evolved worldwide. He explains that democracy as we know it today has tended to literally falter blindly along, making many mistakes, but that on the way it also achieved significant success. The outcome of democracy, he maintains, has never been certain; it has almost always been a matter of stumbling into a way of doing things and then succeeding. Unlike an autocratic system, democracy is never a case of certainty. Nor do democratic leaders have any real guarantees of extended power. They can only live with the certainty that things could be different in the future.⁸⁵

A cursory examination of the documentation we have in formal archival collections in all parts of South Africa reveals that the records dealing with water governance have the same story to tell. Moreover, if the governance is democratic and the water

⁸⁵ . D Runciman, *The confidence trap: a history of democracy in crisis: from World War 1 to the present* (Princeton University Press, New Jersey, 2013).

workers responsible for installing, operating and maintaining the water infrastructure function within the framework of a free market-type system, the insights into an understanding of our society's water history, becomes even more interesting. The documents will, it seems, then record in great detail how officials receive instructions and how they act in the management of water infrastructure.

For example, as a rule, materials required for infrastructure development are procured from private sector institutions. This is despite the fact that a strong global tendency towards ethical awareness has arisen. It is interesting to note that regardless of this trend, government has decided that the most efficient way to proceed is for the authorities to interact with the private sector to develop the country's water infrastructure.

Understanding democracy has everything to do with comprehending our interaction with water. Since the earliest times, while consuming water, we developed systems of governance and water management. They are an extension of the basic manner in which we order our life worlds. Traces of water governance go back to the evolution of the family unit, the formation of the nuclear community and the beginnings of urban and state formation in southern Africa. Much of that knowledge is not confined to information in the conventional dusty archive. This is the kind of archival material which we still need to retrieve from the oral traditions and unwritten histories of our multiracial society.

Interestingly, we have also worked with water under circumstances of great uncertainty. No two situations are ever the same. There may be some similarities, but there will always be problems that need to be solved. So often we tend to speak of 'water problems'. Fishman reckons there is no such thing as a water problem. Instead, he argues succinctly that it is usually a 'human problem'.⁸⁶ This being so, if we can learn from the archives how to deal with the human problems related to water, the past will make an immense contribution towards our understanding of the future.

Archival repositories are centres of political authority. They preserve the records of a political system that wielded significant power and authority. By accommodating the reflections we find in documentary materials – those beyond the direct confines of state formations – we will hopefully be able to understand how ordinary people live their lives in a social ecology where water plays a pivotal role. Interestingly, once we transfer our understanding of power relations to water, we begin to comprehend that the typical water archive contains material on the ways we work/interact with water. Deeper circumspection brings us to the awareness that the archive is more than the story of how we have governed water. In many respects we are dealing also with a deeper discourse on how the nature of water actually defined us – and in a sense even governed us. That forms part of the history which should also be recorded in our search for documentary evidence. It comes in a variety of shapes and forms. It

⁸⁶ . C Fishman, *The big thirst: the secret life and turbulent future of water* (Free Press, New York, 2012), Chapter 8.

can for example be in correspondence, private or public; a newspaper report; or a photograph that speaks a thousand words by capturing virtually what the mind has captured instantaneously.

The sources of history have in the past half-century become more diversified.⁸⁷ The written document is no longer the only source. There are audio and visual sources that need to be considered. These will grow increasingly in importance as digital communication technologies become more integrated and sophisticated. Neither are the sources confined to the singular item in an archive. They have multiplied and become more accessible and open. The spectrum of opportunities for interpretation and analyses in history, based on primary sources, are substantially more numerous and interactive than ever before because of this accessibility.

The historical reminiscences of a retired engineer, writing on dam construction projects in the post-World War II era⁸⁸ form part of prime documentary information that needs to be located and taken up in a collection of sources to tell a future generation how things were done, way back then. The narrative discourse, situated outside the formal governance environment, provides a wealth of cultural insights on the daily conduct of our collective lives, the frustrations of grappling with problems ... and the joys of discovering ourselves whilst interacting with nature. In many ways too, these histories direct us to the realisation that we have to rely also on those materials that Tosh describes as the 'records of bureaucracy'.⁸⁹

It is against this backdrop and with a reflexive inclination that SAWHAR members will in future have to contemplate the texture and fibre of information of outstanding quality. Although it may be dated it still maintains a usefulness that is generic in nature and yet specialised. It enables us to extend our vision across the boundaries of the past, present and future timeframes. The only way SAWHAR can develop into a relevant repository of water-related sources, is to focus on a consistent and sustained method of locating potential primary sources of information. SAWHAR's process of heuristics will constantly have to be subjected to scrutiny in an effort to determine where and how relevant sources of history can be found. For example, the social media documentation of SMS-correspondence between the resident of a small Free State town and his local councillor over the frustrations and trauma of having to manage without any significant water supply in 2013, needs to find a place in the collection.⁹⁰

⁸⁷ . J Tosh, *The pursuit of history: aims methods and new directions in the study of modern history*, Fifth edition (Routledge, London and New York, 2010), pp. 90-1.

⁸⁸ . DWA, I Thompson – JWN Tempelhoff, *Water Alumni*, December 2013. Copy of article: W. Alexander, "Post WWII dam construction", pp. 1-10.

⁸⁹ . J Tosh, *The pursuit of history: aims methods and new directions in the study of modern history*, Fifth edition (Routledge, London and New York, 2010), pp. 99-104.

⁹⁰ . CuDyWat, Brandfort Project archive (Under construction 2013-4).

Appropriate heuristic practices will ensure that the unconventional materials, such as the example provided above on the history of human interaction with the aquatic hydrosphere, can exist alongside valuable official materials on great technical and managerial accomplishments in South Africa's water heritage.

Documentation of the Department of Water Affairs

From talks held with a number of officials and former officials of the DWA it is evident that there are concerns about the possibility that valuable material might already have been lost. We at SAWHAR have heard many disclosures about offices that were 'cleared up' after a colleague at the DWA retired. It seems that many potentially valuable documents were simply discarded. This appears to have been part and parcel of the political transition in the aftermath of the 1994 election and the dawn of South Africa's new multiracial democracy.

Simultaneously, the digital revolution of electronic documentation began. Hard copy material was on the wane when the personal computer began to make breakthroughs into the everyday life of ordinary people in government, business, schools, universities and households. The DWA has always been a progressive government department. Many highly qualified engineers and natural scientists worked side-by-side with legal experts, economists and management experts in the development of what has always been one of the larger departments of state in South Africa.

According to Ms Isa Thompson, the chief engineer of national water resource planning, the DWA website provides ample access to a vast amount of documentation on a great variety of topics and forms part of what she calls 'a living archive'. Digitisation has indeed changed the way in which many offices operate in the department. In the field of design, plans have been drawn up electronically for a considerable period of time. They are also stored in this manner.⁹¹

From a technical perspective the loss of documentation such as the DWA's hydrology reports and countless project reports dating back to the early 1960s, implies that valuable time and effort must be wasted to research what has in effect been done before. In some cases significant information recovery plans have been introduced.⁹²

According to Ms Thompson, until about 1996 there were strict filing procedures in the DWA. By the beginning of the new millennium things began to go awry. Many officials left the department. Once they vacated their offices, their computers were cleared of all information in readiness for the next person to occupy the office. A great deal of useful electronic information might well have been lost.⁹³

⁹¹. SAWHAR, Depts DWA. 20131120, Interview I Thompson, DWA, Pretoria (Audionote file).

⁹². SAWHAR, Depts DWA. 20131120, Interview I Thompson, DWA, Pretoria (Audionote file).

⁹³. SAWHAR, Depts DWA. 20131120, Interview I Thompson, DWA, Pretoria (Audionote file).

Furthermore, there are indications that meetings are no longer conducted as they were in former times. Meetings with consultants, for example, are not necessarily minuted. It has also become apparent that in some cases all the relevant stakeholders (such as representatives from other government departments, provincial or even local government bodies) do not always attend DWA meetings. In many respects, according to Ms Thompson, the continuity of an orderly government department may well go awry under such circumstances.⁹⁴

During the discussions held with personnel at the National Archives in Pretoria, Johann Tempelhoff was shown a file with a letter dated 1996, in which a DWA official informed the archive that the department had about 1,7 km of shelved documents that they wanted to transfer to the archives in due time.⁹⁵ The correct procedures had not been followed and it appeared that the correspondence, as well as the proposed transfer of archival material came to an abrupt end. The indications are that these documents were stored in a DWA building in Pretoria West.⁹⁶ It is not known whether the material has been stacked away in an orderly manner.

It comes as no surprise when officials and managers complain that they simply are swamped with paper. The digital revolution brought even more paper in its wake and vast quantities of correspondence filled in-boxes and out-boxes in countless offices – all destined eventually to be stored somewhere. At the WRC, Dr Inga Jacobs showed Johann Tempelhoff a filing chamber that was relatively neat, but it was clear that shelf space was running out. Many of these documents have a direct bearing on the finances involved when running research projects. Naturally, these documents would typically also be accommodated in a digital format on a server system.⁹⁷

Recommendation: water-related archival materials of government departments

Formal archives of government departments, such as the forerunner of today's department of water affairs, require special attention. Therefore the SAWHAR team will constantly seek closer collaboration and working partnerships with governmental records divisions. There appears to be a need for creating a sense of cohesion in the consolidation of the formal archival materials related to the department of water affairs (DWA).⁹⁸ It is suggested that a research and

⁹⁴ . SAWHAR, Depts DWA. 20131120, Interview I Thompson, DWA, Pretoria (Audionote file).

⁹⁵ . SAWHAR, NARS, 20131120, J Tempelhoff, Interview Wagener and Pretorius, National Archives Repository, Pretoria 2013.11.20.

⁹⁶ . SAWHAR, Depts DWA. 20131120, Interview I Thompson, DWA, Pretoria (Audionote file).

⁹⁷ . SAWHAR, WRC funding 2013. Discussion Johann Tempelhoff – Inga Jacobs, WRC, Pretoria, 2013.06.18.

⁹⁸ . See JWN Tempelhoff, Interim report on the South African Water History Archival Repository Project at North-West University (Vaal), (Vanderbijlpark, 2013).

reconnaissance team consisting of an experienced archivist, as well as an official of the department of water affairs, in collaboration with a qualified historian, visit a number of regional offices of the department of water affairs in South Africa to:

- d) Make an assessment of the department's local documentary material and how it is preserved.
- e) Compile a report on
 - i. the condition of the documents in storage at the regional offices of the department;
 - ii. the relative importance of the available documentation;
 - iii. recommendations on the need for archiving the material.
- f) Establish relations with regional offices of the National Archives Service to negotiate for the accommodation of archival material of the regional offices of the department of water affairs.

In a second phase a number of social science graduates should be appointed as officials in DWA. One requirement should be for them to have the subject of History as a major in addition to potential co-majors in Public Management, Library Science, Information Communications Technology, Political Science and/or International Politics.

The graduates should also register for formal training, funded by the DWA, in archival science. UNISA offers a postgraduate diploma in archival science. A good option would be to seek graduates of universities situated in the regions where the DWA documents are located. Local or regional knowledge is always a practical asset in the construction of an archive. It can also stimulate potential research. In a period of in-service practical training the graduate officials should work in close collaboration with the records department at DWA's Pretoria head office for about six months. In a second phase (potentially also for six months) the officials (archivists-in-training) should be posted out to DWA's regional offices where they start ordering the regional departmental historical records under the supervision of a local records manager. The material – preferably closed files dating back at least 20 years – can then be transferred to the nearest regional branches of the national archives repository.

Ordering the records at DWA's head office, as well as the regional offices, should be done in close collaboration with the relevant local or regional offices of the department of arts and culture's archival repositories. In the case of the head office of DWA, the dealings will be directly with the Pretoria office of the national archives repository. It is clear that currently the national archives service is understaffed. The available human resources cannot perform the necessary work of ordering the archives of the department. It will therefore be up to the archivists (records managers) trained by DWA, to remedy this in collaboration with the national archives.

While ordering the hard copy archives attention should simultaneously be given to the digitisation of the archives. It is advisable that the DWA take that responsibility. For material after 1980 there should be a significant corpus of digital documentary information available. That information should be consolidated with the assistance of officials in the respective information technology divisions.

A number of officials, preferably with a matric qualification, can be employed for the digitisation process. They should also be trained as document clerks in the offices of DWA, both at the regional and national level. In some cases they should also develop extensive skills in the direction of ordering archives. However, this work should be done under the supervision of a qualified archivist.

It is furthermore recommended that the archiving initiative in the DWA be done in the context of the InterPARES system of documentary storage with a view to potential consolidation into the larger system in the future.

Copyright and digital archival materials

The objective of SAWHAR's digitisation programme is to make the information of the archival repository as accessible as possible to potential users. Ideally the SAWHAR contents should be accessible on the internet with certain security measures in place to maintain some form of control over what is considered confidential information. However, of greater importance is the legal matter of copyright.

Copyright is an inescapable part of everyday life. While it is accepted that people, whether academics or not, learn from each other's intellectual property, they may not copy it.⁹⁹ Copyright is a widely used international term and has various legal, historical and philosophical interpretations. For purposes of the South African domestic law, the concept and legal nature of copyrights has moved past the common law perception of imitating someone else's work. It has become a structured statutory framework, which makes it possible for copyright owners to prohibit unauthorised copying of their protected works¹⁰⁰

Traditionally the library was seen as

a facility to preserve and manage a scarce and expensive resource...both for preservation and the ability to supply...As a means to preserve, manage and archiving scarce resources, libraries duplicated original work by way of a hard copy.¹⁰¹

This perception, however, seems to be at loggerheads with the manner in which we currently use the internet. Electronic information sources, in a great variety of fields and of a scarce nature have become more readily available.¹⁰² It can be contended that the relative status of the library or the archive has changed from functioning as a key player in information sharing, to just another way in which to access

⁹⁹ A Smith, *Copyright Companion* (Butterworths, Durban 1995) p. 1.

¹⁰⁰ A Smith, A, *Copyright Companion* (Butterworths, Durban 1995) p. 1.

¹⁰¹ A Janse van Vuuren & H Latsky, "Is the hybrid library the future destination of choice?" *Mousaion*, 27(2), 2009, p. 2.

¹⁰² A Janse van Vuuren & H Latsky, "Is the hybrid library the future destination of choice?" *Mousaion*, 27(2), 2009, p. 2.

information.¹⁰³ Nowadays there is in fact a tendency to speak of the library as forming part of a knowledge commons, largely as a result of the vast array of different forms of media available for extracting information and its concomitant knowledge.¹⁰⁴

The idea of copyrights and duplication of certain intellectual works is nothing new to university libraries and archivists. That being said, the legal and policy concerns need to be clarified so that copyright infringement can be avoided at all costs. This section of the report aims to provide a legal clarification of the legality of duplicating material in both hard copy and digital format for purposes of an online repository.

Copyright in terms of the Copyright Act, No. 98 of 1978.

When does copyright vest in a work?

The *Copyright Act* No. 98 of 1978 (hereafter referred to as the Act) is enacted to regulate copyright and to provide for matters incidental thereto. However, the Act does not give a concise definition of what copyright is. It merely states that copyright 'means copyright under this Act'.¹⁰⁵ Smith confirms that the definition does not cover the full ambit of the legal protection provided by the Act, and that

'the Act provides a substantial arsenal against unauthorised copying and against trading in unauthorised copies....'¹⁰⁶

In addition, Klopper refers to copyright as a misnomer, because it affords the copyright holder far more entitlements than just the ability to restrict the copying of his or her copyrighted work. However, he does give a description of copyright by stating that copyright entitles the holder to commercially exploit his or her original intellectual creation, which has been transposed into material form, and also protects the holder against exploitation of his or her work by another.¹⁰⁷ Simply put, copyright is the prohibition on unlawful or unauthorised copying of material (tangible) works.

Section 2 lists multiple works that are eligible for copyright protection, but only if they are original. These include literary works,¹⁰⁸ musical works,¹⁰⁹ artistic works,¹¹⁰

¹⁰³ A Janse van Vuuren & H Latsky, "Is the hybrid library the future destination of choice?" *Mousaion*, 27(2), 2009, p. 2.

¹⁰⁴ See for example Penn State University, libraries: "Tombros and McWhirter knowledge commons" at <http://www.libraries.psu.edu/psul/kc.html> (Accessed 2014.02.21).

¹⁰⁵ Section 1(1) of the *Copyright Act*, No. 98 of 1978.

¹⁰⁶ A Smith, *Copyright Companion* (Butterworths, Durban 1995) p. 4.

¹⁰⁷ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012) p. 137; Section 20 of the *Copyright Act*, No. 98 of 1978.

¹⁰⁸ 'Literary work' includes, irrespective of literary quality and in whatever mode or form expressed (a) novels, stories and poetical works; (b) dramatic works, stage directions, cinematograph film scenarios and broadcasting scripts; (c) textbooks, treatises, histories, biographies, essays and articles; (d) encyclopaedias and dictionaries; (e) letters, reports and

cinematograph films,¹¹¹ sound recordings,¹¹² broadcasts,¹¹³ programme-carrying signals,¹¹⁴ published editions,¹¹⁵ and computer programmes.¹¹⁶ It is important to note that the definition in section 1(1) of the Act sets out the requirements for the existence of each category.¹¹⁷ As for the question of when copyright arises, section 3 states that copyright arises where an original work is created by the author who is a suitably qualified person, whether alone or in case of joint authorship.¹¹⁸

memoranda; (f) lectures, speeches and sermons; and (g) tables and compilations, including tables and compilations of data stored or embodied in computer or a medium used in conjunction with a computer, but shall not include a computer programme. Section 1(1) of the *Copyright Act No. 98 of 1978*.

109 'Musical work' means a work consisting of music, exclusive of any words or action intended to be sung, spoken or performed with the music. Section 1(1) of the *Copyright Act No. 98 of 1978*.

110 'Artistic work' means, irrespective of the artistic quality thereof (a) paintings, sculptures, drawings, engravings and photographs; (b) works of architecture, being either buildings or models of buildings; or (c) works of craftsmanship not falling within either paragraph (a) or (b). Section 1(1) of the *Copyright Act No. 98 of 1978*.

111 'Cinematograph film' means any fixation or storage by any means whatsoever on film or any other material of data, signals or a sequence of images capable, when used in conjunction with any other mechanical, electronic or other device, of being seen as a moving picture and of reproduction, and includes the sounds embodied in a sound-track associated with the film, but shall not include a computer program. Section 1(1) of the *Copyright Act No. 98 of 1978*.

112 'Sound recording' means any fixation or storage of sounds, or data or signals representing sounds, capable of being reproduced, but does not include a sound-track associated with a cinematograph film. Section 1(1) of the *Copyright Act No. 98 of 1978*.

113 'Broadcast', when used as a noun, means a telecommunication service of transmissions consisting of sounds, images, signs or signals which- (a) takes place by means of electromagnetic waves of frequencies of lower than 3000 GHz transmitted in space without an artificial conductor; and (b) is intended for reception by the public or sections of the public, and includes the emitting of programme-carrying signals to a satellite, and, when used as a verb, shall be construed accordingly. Section 1(1) of the *Copyright Act No. 98 of 1978*.

114 'Programme-carrying signal' means a signal embodying a program which is emitted and passes through a satellite. Section 1(1) of the *Copyright Act No. 98 of 1978*.

115 'Published edition' means the first print by whatever process of a particular typographical arrangement of a literary or musical work. Section 1(1) of the *Copyright Act No. 98 of 1978*.

116 'Computer programme' means a set of instructions fixed or stored in any manner and which, when used directly or indirectly in a computer, directs its operation to bring about a result. Section 1(1) of the *Copyright Act No. 98 of 1978*.

117 It is important to know the requirements of each individual work to avoid infringement. As stated, each work has its own requirements and protection against specific forms of copyright infringement. Read H Klopper, "Copyright and the internet", in S. Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* for an in-depth discussion on the different works and their requirements.

118 A Smith, *Copyright Companion* (Butterworths, Durban 1995) p. 6.

The requirement in section 3 can be divided into two components, namely the originality of the work; and whether the author is a suitably qualified person. Firstly, originality does not specify that the work must be distinctive, but rather that it is created by the own labour, skill or judgement of the original author without being a reproduction of another person's work.¹¹⁹ Furthermore, the crucial question is whether the person who claims authorship of the work is the originator thereof.¹²⁰ Secondly, a qualified person is defined as someone who is a South African citizen, is domiciled or resident in South Africa, in the case of a juristic person,¹²¹ and in the case of a body or organisation, that it is incorporated under the laws of the Republic of South Africa.¹²²

Whereas section 3 of the Act provides for a qualified person, section 4(1) also presents an alternative for copyright to vest in a work if the work was first published, made or emitted in South Africa.¹²³ For a work to be deemed published, copies of the work must exist; it must be issued to the public with the permission of the copyright holder; and lastly, sufficient copies of the work must be issued to the public to satisfy reasonable needs.¹²⁴ Along with the requirements for a work to be published, there are also 'acts' that do not involve publication. These include a performance of a musical or dramatic work; cinematograph film or sound recording; a public delivery

¹¹⁹ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 155.

¹²⁰ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 115.

¹²¹ Traditionally only natural persons may be authors for the purposes of copyright. This can be directly linked to the nature of a juristic person, because it does not physically exist and is incapable of intellectual creation. However, this only applies to literary, musical, and artistic works.

¹²² H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 151; Section 3 of the *Copyright Act No. 98 of 1978*.

¹²³ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 151. In the case of literary, musical or artistic work, sound recording or published editions, copyright is vested upon the publication of the work.

¹²⁴ Section 1(5) of the *Copyright Act No. 98 of 1978*. Section 1 of the Act defines 'copy' as a reproduction of a work, and, in the case of a literary, musical or artistic work, a cinematograph film or a computer program, also an adaptation thereof: Provided that an object shall not be taken to be a copy of a work of architecture unless the object is a building or a model of a building. As for the public issue, it can be assumed that any distribution of a copy, whether for sale or hire, is sufficient. The quantities to the public will depend on the nature of the work and the circumstances of each case. See H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 152.

of a literary work; a transmission in a diffusion service; the broadcasting of a work; an exhibition of a work of art; and a construction of a work of architecture.¹²⁵

Who holds copyright of copyrighted work?

The creator or author of a work is usually also the copyright holder of the work except when an agreement for the assignment of copyright was concluded before the work was created.¹²⁶ Section 21 lists exceptions to this rule for works created in terms of an agreement,¹²⁷ or works created by or under the control of the state or certain international organisations. If an employee, for example, creates a literary or artistic work in the course of his/her employment under a contract or apprenticeship,¹²⁸ the holder of the copyright of the work created is the owner of the business/company. The owner's (the business or company's) copyright is limited to the publication in the scope of the business, for example in a newspaper or magazine, while the author of such work retains his/her copyright in the work concerned.¹²⁹ As for the copyright of work created by the state; or under the control of the state; or an international organisation; the copyright of the final work vests in the state or the organisation.¹³⁰

When and how does copyright infringement occur?

Infringement of copyrights can either be direct, or indirect. Direct infringement occurs when a person, other than the copyright holder, does something contrary to the entitlements of the Act. In simple terms this conduct amounts to unauthorised use or copying of original works.¹³¹ Indirect infringement on the other hand, occurs when certain acts are carried out in relation to the entitlements of a copyright holder. The copyright is indirectly infringed in the sense that it *imposes the full exclusive exploitation* of the intellectual creation by the holder.¹³² Direct copyright infringement occurs, for example, when:

¹²⁵ Section 1(5)(d)(i) – (vi) of the *Copyright Act*, No 98 of 1978.

¹²⁶ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 153. The same applies for co-authors or co-creators.

¹²⁷ An example of this type of work would be works created in the course of employment.

¹²⁸ An example of this type of employment includes working for a newspaper or magazine.

¹²⁹ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 153; Section 21(1)(a) – (e) of the *Copyright Act*, No 98 of 1978.

¹³⁰ Section 21(2) of the *Copyright Act*, No. 98 of 1978.

¹³¹ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 158.

¹³² H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 158; Section 23(2) of the *Copyright Act*, No 98 of 1978.

- A person commits an act which falls within the sole entitlement of the copyright owner.
- There is unauthorised copying of an original work.
- There is unauthorised use of an original work.
- There is unauthorised adaptation of an original work.¹³³

The copying, use or adaptation of the work does not refer only to the work as a whole, but also a substantial portion of the work. Unlike direct infringement of copyrights, indirect infringement occurs if a person, without the permission of the copyright holder:

- Imports an article into South Africa for the purposes of private or household use.
- Sells or lends an article to another person or offers the article for sale or hire.
- Distributes an article for the purposes of trade or for any other purpose in a manner which is to the prejudice of the copyright holder.
- Obtains an article which relates to a computer programme in South Africa.¹³⁴

Despite the transfer of copyrights, it is worth noting that the author retains certain residual rights.¹³⁵ Also referred to as ‘moral rights’, these works include literary, musical and artistic works, films and computer programmes. This means that the author retains the entitlement to claim authorship.¹³⁶ The author, furthermore, retains the entitlement¹³⁷ to object to a distortion, mutilation or any modification of his/her work.¹³⁸

Section 12 of the Act provides for general exceptions from the protection of literary and musical work. Copyright is not infringed by fair dealing with a work for purposes of:

- Research or private study.

¹³³ H Klopper, “Copyright and the internet”, in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 159.

¹³⁴ H Klopper, “Copyright and the internet”, in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 160.

¹³⁵ Section 20 of the *Copyright Act, No. 98 of 1978*.

¹³⁶ H Klopper, “Copyright and the internet”, in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 161. The entitlement is also known as paternity rights, and it only refers to the claim for authorship, not a claim for copyright.

¹³⁷ This is also referred to as an integrity right.

¹³⁸ H Klopper, “Copyright and the internet”, in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 161.

- Personal or private use by a person who uses the work.
- Criticism or review of the copyrighted work.
- Reporting current events in a newspaper, magazine or similar periodical or in film or by means of broadcast.¹³⁹

Klopper explains the exceptions by first discussing the concept of fair dealing. He states that:

'Fair dealing' for the purpose of research, private study or personal or private use is inadmissible in the case of film, sound recordings and computer programs. Home recordings of videos and CDs are consequently infringements of copyright. 'Fair dealing' [however] does not apply to broadcasts, making time-shifting recordings of TV programmes lawful. What constitutes 'fair dealing' depends on the circumstances of each case.¹⁴⁰

Other general exceptions include:

- Reporting on judicial proceedings.
- Reasonable quotes from works.
- Use of illustrations for educational purposes.
- Duplication by the SABC.
- Reproduction of a speech or a lecture in the news media.
- Reproduction of news articles or sermons.
- Use of a work for the purposes of demonstration by a dealer of a television, radio or similar device.
- Previously imported works with the permission of the copyright holder.
- Background use in broadcast, television programmes or in films.
- Reconstruction of a building.
- Works in or about public places.
- Programme-carrying signals containing news.
- Works that are part of a cinematograph film.
- Conduct if the copyright court has granted a compulsory licence.

¹³⁹ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 161.

¹⁴⁰ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 161.

- Conduct if allowed by regulations.¹⁴¹

For the purposes of this report it is important to consider conduct allowed by regulations. Section 13 of the Act empowers the minister to promulgate regulations which authorise the reproduction of work which otherwise would have constituted copyright infringement.¹⁴² With regard to the regulations to authorise the reproduction of works, a library may make reproductions of:

- An unpublished work (in its entirety) expressly for the purpose of conservation and safekeeping.
- An unpublished work (in its entirety) for replacing a copy which has been damaged, worn out, lost or stolen and cannot be replaced at a reasonable price.
- On request of a user for private study or personal use, not more than one article in a journal or a reasonable portion of another article, may be reproduced.
- On request of a user for private study or personal use, an entire published work may be reproduced if an unused copy of that work cannot be obtained at a reasonable price.¹⁴³

How can copyright be transferred?

Copyright, just like any property right, can be transferred from one holder (the author) to another. This assignment can be in respect of all the entitlements of the copyright, or only in respect of some of the entitlements. Moreover, entitlements can be assigned/transferred to multiple persons. The assignment may be restricted to;

- The specific entitlement assigned, for example whether the work may be published.
- The geographical area for which the assignment is valid.
- The duration of the assignment.¹⁴⁴

¹⁴¹ H Klopper, "Copyright and the internet". in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 162.

¹⁴² Section 13 of the *Copyright Act*, No. 98 of 1978 provides that in addition to reproductions permitted in terms of this Act reproduction of a work shall also be permitted as prescribed by regulation, but in such a manner that the reproduction is not in conflict with a normal exploitation of the work and is not unreasonably prejudicial to the legitimate interests of the owner of the copyright. See regulation 3 of the Government Notice R1375 in the *Government Gazette* No. 9807 of 28 June 1985.

¹⁴³ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 162.

Copyright may only be transferred by way of an assignment, disposition in a will, or by the operation of law.¹⁴⁵ For the transfer to be valid, it must be in writing and signed by or on behalf of the copyright holder. Apart from this formality, the mutual intention to transfer and to acquire copyright must be an explicit term in the agreement.¹⁴⁶ The grant of a licence, on the other hand, does not constitute a transfer of copyright as an intellectual property right. The licence merely assigns certain entitlements of the copyright.¹⁴⁷ When a transfer is effected the holder loses his/her entitlements. Consequently, the copyright holder retains the copyright of the work, but waives any legal recourse/remedy as a holder.

There is a distinction drawn between exclusive and non-exclusive licences. An exclusive licence grants the power to exercise one or more entitlements to the exclusion of all parties, including the copyright holder. In contrast, a non-exclusive licence does not exclude the power of the copyright holder.¹⁴⁸ Also, an exclusive licence can only be valid if it is in writing and signed by the grantor. A non-exclusive licence can be granted either orally or in writing.¹⁴⁹

Copyright and digitisation

Introduction

Copyright has adapted itself in multiple ways so that it can contend with the challenges of new emergent problems that have arisen in the digital era. One of these is that using digital means, works can easily be copied, distributed, transmitted, manipulated, combined and edited. In addition, it is difficult to distinguish the act of digital copying from the end distributor of a work, or to identify a digital copy from its quality.¹⁵⁰ To counter this problem, academic libraries increasingly consider alternative possibilities and opportunities for making a contribution through the

¹⁴⁴ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 167.

¹⁴⁵ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 166.

¹⁴⁶ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 167.

¹⁴⁷ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 166.

¹⁴⁸ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 167.

¹⁴⁹ Section 23 of the *Copyright Act*, No. 98 of 1978.

¹⁵⁰ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 167.

development of online repositories.¹⁵¹ Institutional repositories have in the past been defined as those collections which represent an:

... organisational commitment to the stewardship of these digital research materials, including long-term preservation where appropriate, as well as organisation and access or distribution. A well-organised and efficient repository allows for easy, decentralised self-archiving of the intellectual content of an academic environment.¹⁵²

The problem, however, is that the South African intellectual property law has not yet developed to the point that it affords sufficient legal protection against infringement of intellectual rights. Due to the lack of development of intellectual property law, copyright has also fallen behind. It is often virtually impossible to detect who actually infringed a particular copyright.¹⁵³ Despite the influence of digitisation, copyright continues to exist irrespective of the form in which the work is copyrighted. Klopper illustrates this by arguing that a book that is transposed onto a CD or a multimedia form still enjoys the same copyright protection as the original printed version.¹⁵⁴ The same may be argued for original (printed) historical documents that are digitalised for purposes of an online repository.

Infringement of copyrighted works in the digital domain

Infringement in the digital domain¹⁵⁵ occurs mainly by copying, reproducing, communicating to the public or distributing a copyrighted work without the authority of the copyright holder.¹⁵⁶ Copyright of digital works can also be directly or indirectly infringed. The electronic storage of copyrighted work is an infringement of the author's copyright. Copyright, within the scope of digitisation occurs when:

- a copyrighted work is placed into a computer by any means;
- any copyrighted material is scanned into digital format, including digitising photographs, films and sound recordings;
- material is either uploaded to or downloaded from servers or other platforms; and

¹⁵¹ A Janse van Vuuren & H Latsky, "Is the hybrid library the future destination of Choice?", *Mousaion*, 27(2), 2009, p. 5.

¹⁵² A Janse van Vuuren & H Latsky, "Is the hybrid library the future destination of Choice?", *Mousaion*, 27(2), 2009, p. 5.

¹⁵³ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 168.

¹⁵⁴ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 168.

¹⁵⁵ For purposes of this report, any reference given to either digitisation or the digital domain must be read within the context of creating an online repository.

¹⁵⁶ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 168.

- a file is transferred from one network to another.¹⁵⁷

Therefore, making electronic copies of protected works also constitutes copyright infringement.¹⁵⁸ The same applies to digitised works reproduced in a publication, because the digitised work is represented in a material form.¹⁵⁹ Downloaded work can also be reproduced in permanent format by printing or storage on a hard disc, which is also an infringement because it too is a publication.

Whether the work is in its original form or in a digitised format, the same accusation of infringement may arise. To avoid this, one first has to identify the holder of the work's copyrights. Thereafter one must obtain his/her written consent to reproduce the copyrighted work by way of either a transferral assignment or a licence.

Intellectual property rights at North-West University

The North-West University (hereafter NWU) has adopted a specific Policy on the Management of Intellectual Property (hereafter referred to as the PMIP) which deals with the ownership, distribution and commercial exploitation of intellectual property developed by staff, students and other parties concerned at the NWU.¹⁶⁰ The PMIP applies to all campuses of the university; to all temporary and permanent employees on the staff establishment of the University; to contract workers of the University; and to all registered students of the University.

The PMIP prescribes that the ownership of all copyrights of employees of the NWU in respect of works created by them in the normal course and scope of employment, vests in the university.¹⁶¹ However, the university does not lay claim to ownership of

¹⁵⁷ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 169.

¹⁵⁸ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 169.

¹⁵⁹ H Klopper, "Copyright and the internet", in S Papadopoulos & S Snail (eds), *Cyberlaw@SA III: The law of the internet in South Africa* (Van Schaik, Pretoria 2012), p. 170.

¹⁶⁰ North-West University 2012 http://www.nwu.ac.za/sites/www.nwu.ac.za/files/files/i-governance-management/policy/IP-1.1.10_IP_e.pdf (Accessed 2014.2.17).

¹⁶¹ North-West University 2012 http://www.nwu.ac.za/sites/www.nwu.ac.za/files/files/i-governance-management/policy/IP-1.1.10_IP_e.pdf; Section 21(1) (d) of the *Copyright Act* No.98 of 1978 states that "Where in a case not falling within either paragraph (b) or (c) a work is made in the course of the author's employment by another person under a contract of service or apprenticeship, that other person shall be the owner of any copyright subsisting in the work by virtue of section 3 or 4."

any rights (including moral rights) and income pertaining to four categories of copyrights. These are artistic works, literary works, textbooks and musical works.¹⁶²

The university's Technology Transfer and Innovation Support Office¹⁶³ has the authority to decide if ownership of the whole or a part of the copyright can be assigned to the staff member, or whether the staff member may use the work in a commercial manner. However, it is important that the owner (in this case the staff member) of a copyrighted work knows that it is his/her responsibility to inform the research director of any commercial or non-commercial concerns pertaining to the transfer of NWU material. An employee of the NWU is not permitted to enter into an agreement without informing the perspective third party that the intellectual property rights of the NWU cannot be transferred to a new third party agreement without the university's consent.

The NWU acknowledges that it is important for staff members to publish and present their work.¹⁶⁴ The PMIP also states that the NWU does not wish to restrict a staff member's freedom to do so. However, the employee must take the necessary precautions if the publication is commercially valuable to the university. The same can be said for the online repository. Although the repository in itself is not a profit-driven project, it may have a commercial importance to the NWU. Therefore, it is vital that the advice of the Technology Transfer and Innovation Support Office be sought before concluding any third party agreements.

Recommendation on copyright

It is important to identify the categories of work that may have copyright protection. As stated above, the *Copyright Act* prescribes different requirements and infringements that may apply to a wide range of copyrighted works. To avoid copyright infringements it is vital to contact the copyright holder of a specific work. The general principle of copyright is that the original author of the work is the copyright holder. If the work was created in the course and duties of the author's employment, the employee's institution will be the copyright holder. However, if the work is created as part of an academic institution, it will be necessary to refer to the

¹⁶² An example thereof would be when a specific copyrighted work, e.g. a literary work, is prescribed to the students as part of a module. The NWU can then not lay claim to any income derived from the copyrighted work.

¹⁶³ The Technology Transfer and Innovation Support Office supports the NWU inventors with all aspects of industrialisation and commercialisation. Its duties include market research product development; intellectual property prosecution; and profile management; funding application assistance; networking with government agencies and industry; licensing negotiations and management; and establishing and mentoring spin-off companies.

¹⁶⁴ North-West University 2012 http://www.nwu.ac.za/sites/www.nwu.ac.za/files/files/i-governance-management/policy/1P-1.1.10_IP_e.pdf

institution's Intellectual Property Policy. Institutions such as the University of Pretoria and NWU have policies in place to regulate copyright related problems.¹⁶⁵

If the institution or the employee of the institution is the copyright holder of a specific work, it will be easier to mandate the deposit of the works in the institution's, or academic library's digital repository.¹⁶⁶ The written permission of the copyright holder, whether by way of an assignment or licence, should cover two important aspects. The first must give permission to make the digitalised work available in the repository. The second must grant users the right to re-use the work to a certain limited extent.

Finally, the institution creating the online repository must create a clear and comprehensive intellectual property policy specifically drafted for the use of the repository's material. This could also be combined with a statement on the terms of use, accompanied by an honour pledge for the use of copyrighted works.

Concluding remarks and recommendations

An archive is a storage facility of valuable primary documents which have a story to tell; collectively they are able to shed light on the past. Archival collections are unique in that they form an organic whole that can provide a collective impression of our history. Archival collections may also comprise secondary sources that interact in very specific modes with other material in the archive or sundry information located in other archival repositories.

Judging from discussions with specialists in the field and individuals who have been intricately involved with the water sector for a lifetime, there is a passion for what has been achieved over the years. There is a sense of pride in work well done. Many are very aware of the importance of conserving details of those achievements and memories for future generations to use.

At the same time there is a functional objective that society harbours; there is an awareness of the value of past experiences for the future.

SAWHAR is focused on the heritage of South Africa's water sector and the accomplishments of former times. There is also the need to shed heuristic light on the interaction of people and water outside the formal water sector. The narrative traditions of rural communities such as their strategies of coping under circumstances of limited water supplies in arid regions, must be recorded. A vast field of exploration awaits the researchers and collectors of this information, be it in written form or in an audio or visual format.

¹⁶⁵ See the NWU's policy at http://www.nwu.ac.za/sites/www.nwu.ac.za/files/files/i-governance-management/policy/IP-1.1.10_IP_e.pdf and the PU's intellectual policy on fair use at <http://web.up.ac.za/default.asp?ipkCategoryID=21193&subid=21193>.

¹⁶⁶ K Pappalardo and A Fitzgerald A 2007 <http://eprints.qut.edu.au/9671/1/9671.pdf> (Accessed 2014.02.21).

Therefore, quite apart from constructing a text archive, SAWHAR needs to pay attention to a virtual museum which can be multimedia in format. The water archive also needs to explore the social structure and dynamics of historical households in all parts of South Africa and among all classes of people. Regrettably there are customs that have already been lost. For example, in the 1870s when the first boreholes and windmills were in use in South Africa, a unique culture of technology developed. Although the tools and equipment came from overseas, the way in which these devices were utilised and the major contribution they made to rural life in South Africa, is still a story that is but half told.¹⁶⁷ The question may well be asked: but what use does it have? One answer is located in the 1970s. With the onset of the oil crisis, when the price of petroleum products increased overnight, scientists and engineers in the USA resorted to 'ancient windmill' technology.¹⁶⁸ Today, windmills are a valued means of producing electricity.

The Waterlit Collection contains a wealth of information on technologies and water science strategies that may seem outdated in the scholarship of the 21st century. However, researchers interested in locating information about exceptional strategies of water purification, or dealing with pollution, might well make some startling discoveries.

The archive, in its deepest origins dating back to the ancient Middle East, China, Greece and Rome, represented a manner of formalising and legitimising political power and authority. By reflecting systemic orderliness, the archive and its magistrate were symbols of discipline and precision. Today archives still carry that respect. However, the archives that seem to carry more authority these days are the ones that are inter-connected with other similar sources of information.

South Africa's Department of Water Affairs has a contemporary digital archive that is compliant with the requirements of accessibility and functionality of information.¹⁶⁹ It is comprehensive and up to date. Yet, the question remains: how will these contemporary sources be stored a decade from now? As pointed out above, the transition from a mainframe computer system to the personal computer; and the shift from the floppy disk to the CD-rom were groundbreaking technological processes that were rapidly overtaken by ever-better technologies. Ironically today we grapple with the simple issue of reconnecting a database with titles to a physical collection. The mind boggles at the realisation that something so simple can become so difficult in a world of emergent technologies.

¹⁶⁷ . See for example S Archer, "Technology and ecology in the Karoo: a century of windmills, wire and changing farming practice", in *The Journal of Southern African Studies*, 26(4), Special issue: African environments: past and present, December 2000, pp. 675-696; and L van Sittert, "The supernatural state: water divining and the Cape underground water rush, 1891-1910" in *Journal of Social History*, 37(4), Summer 2004, pp. 915-937.

¹⁶⁸ . N Wade, "Windmills: the resurrection of an ancient energy technology", in *Science*, New Series, 184(4141), 1974.06.07, pp. 1055-8.

¹⁶⁹ . RSA, Department of water affairs at <http://www.dwaf.gov.za> (Accessed 2013.11.25).

At this point in time, archival experts have reached consensus that the original (primary) document is not destroyed once it has been digitised. It has to be kept, hopefully for posterity. The digitisation of SAWHAR is not the ultimate way to store a primary source collection. It somehow has to have sufficient security to stand up to potential destruction.

The way forward is to:

- start with a full and reliable digitisation programme as soon as possible;
- find a reliable team of scanner operators;
- secure a reliable internet communications platform;
- build ties of friendship with potential material donors and archival users;
- create research interest in the SAWHAR by means of frequent communications with a potential academic and popular user community;
- promote a culture of fondness for digital source materials in research and teaching;
- establish strong relations with key officials of the National Archives in Pretoria and then facilitate communication between the DWA officials at the helm of administration and registration;
- communicate with archivists who can be of assistance to the DWA in helping to develop a line of appropriate supply of materials for the national and provincial archival repositories;
- make a concerted effort to collect information on water in the everyday lives of ordinary people in anthropological and cultural historical contexts that inform us (in various media) of the way in which we humans have interacted with the hydrosphere in southern Africa; and
- find reliable and secure interim storage facilities for hardcopy material.

Section 2

A history of the Waterlit Collection (1974-1999): a hard copy research collection on water studies and its digital catalogue

Introduction

On 17 June 1999 the final meeting of the steering committee, responsible for the Waterlit Database was held at the offices of the Water Research Commission in Rietfontein, Pretoria. It was a motley group of officials and representatives of water research entities in South Africa. For each of the six committee members present at the meeting, there was another member who had formally made an apology for absence. According to the minutes:

The Chairperson (Ms M Pretorius) remarked that the meeting is a final meeting of the current format due to the changes that will be made to the Waterlit database building process...¹⁷⁰

The same committee, now in the process of dissolving, had been privy for more than a quarter of a century, to a strategy devised by water research managers at South Africa's Council for Scientific and Industrial Research (CSIR) to secure the latest scientific information relating to all fields of water studies from many parts of the world. The fact that by 1999 the collection stood at more than 300 000 items,¹⁷¹ making it one of the largest databases of its kind, said a great deal about the dedication and investment in water knowledge of a special kind, and for a special purpose.

However, on the eve of the new millennium and at a time that the new post-apartheid South Africa was in the process of addressing the challenges and the future in a distinctly different way, the value of a collection of hard-copy documents on water from around the world, seemed almost nondescript.

After 1999 the Waterlit Collection (WLC) was transferred to Rhodes University in Grahamstown, but it was returned to the Water Research Commission a few short years later before being transferred to the Vaal campus of North-West University

¹⁷⁰. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17, p. 1.

¹⁷¹. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 4/99 CSIR progress report to the steering committee Waterlit Database: production and development, p. 1.

(NWU) in Vanderbijlpark, where the WLC forms a central part of the South African Water History Archival Repository (SAWHAR).

Outline

In the discussion to follow the objective is to come to a better understanding of what the WLC was all about from a historical perspective. How did it come into existence; and what role did it play in laying the foundations for a considerable corpus of water-related knowledge in South Africa's research sector?

Attention is given to the workings of the system, the people who were behind operations and how the WLC was marketed. A significant part of the discourse deals with the manner in which technology change at the CSIR affected not only the WLC, but also the people working in the South African Water Information Centre (SAWIC). Considerable time and effort was put into marketing the collection in South Africa, especially amongst researchers, managers and officials working in the country's water sector. By the 1980s the WLC was also available to users overseas. Much marketing went into the collection, to the extent that one of the steering committee members of the WLC on occasion observed that he found it remarkable that a service which brought in so little money had to be marketed so comprehensively.

The WLC, even in its original format was a vast collection of hard copy documents. The introduction of advanced information science technologies, such as mainframe computers and later personal computers, as well as internet technology, has over the years enhanced the potential power of the WLC to generate knowledge. From the outset the system was destined to be integrated with the most up- to-date electronic technologies.

One area of notable change is the way the content of the WLC was duplicated/made widely available to users. What began as sending photocopies to users, who requested specific information, later became scanned documents sent by email. Furthermore, what appeared to be a massive electronic database catalogue that could only be maintained on a mainframe computer and even perhaps housed in a separate building designated for this purpose, could now be stored and distributed on a single CD-rom.

In the 1970s the WLC featured a catalogue that was linked to a physical set of documents in a CSIR library. This library provided researchers with some of the latest and most important information in the field of water studies. Water studies came to the fore as an important interdisciplinary field of research in the aftermath of the severe drought conditions in South Africa in the 1960s. There was a dire need for the government to secure sufficient supplies of good quality water in a rapidly developing but water-scarce country. Behind the physical catalogue of the WLC and its database there were many librarians and information scientists working at literally retrieving very specific pieces of information from a vast array of potential sourcing areas, and doing a meticulous job of cataloguing the material and sending it to individual users.

As a result of the information technology revolution of the 1980s and 1990s the operations of the WLC were radically transformed. The collection was also relocated from its original base at the CSIR to the Water Research Commission, its prime funding agency.

In 2013 the WLC, in hard copy, became part of the South African Water History Archival Repository (SAWHAR) at NWU where its value as a vast source of material of historical significance will be determined by its accessibility for researchers.

Post-World War 2 water research in South Africa

After World War 2, South Africa developed at a rapid rate in terms of mining, industry and commerce. Wartime conditions and the fact that thousands of South Africans had participated in the devastating war meant that a new awareness of the need for change had arisen. Political leaders, scientists, and experts in technology and the management sciences all realised that if the country was to make headway, development had to move up a gear. First and foremost, attention was given to putting science and technology to work in the industrial development of the country. The CSIR was founded in Pretoria in 1948 to provide essential scientific and technological support for the country's burgeoning growth path.

The realisation that South Africa had finite water resources had the effect that at the CSIR a Division for Water research was started at the National Research Laboratory in 1948. As the activities of the division increased greater autonomy came with the formation of the National Institute for Water Research (NIWR) in 1958. By 1966 the NIWR had regional laboratories in Durban, Bellville, Bloemfontein and Windhoek. Furthermore, there was a Research Group for Hydrobiology created at Rhodes University in Grahamstown.¹⁷²

The NIWR received its funding primarily from a portion of the annual parliamentary grant to the CSIR. The NIWR, apart from its close co-operation with the CSIR's research laboratories, also collaborated with government departments such as Water Affairs; Health; Bantu Administration and Planning; provincial and local administrations and also with the industrial sector. Institutionally the NIWR had close ties with municipal engineers and the South African Institute of Civil Engineers. It also made an effort to remain in close interaction with overseas organisations involved in water research.¹⁷³

The interdisciplinary nature of the NIWR was evident from the outset. Water research could not be confined to a single discipline. Therefore the institute tended to include disciplines of sanitary engineering, chemical engineering, chemistry (organic, inorganic, physical and biochemistry), microbiology, zoology, and botany.

¹⁷². JG Stander, "Water pollution research: a key to wastewater management", in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 774.

¹⁷³. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 775.

In 1966 there were six research groups and four regional laboratories in which the institute operated.¹⁷⁴

The areas in which the NIWR operated

The NIWR worked extensively in the fields of anaerobic digestion, arid zone research, marine disposal of effluents, and sewage purification.¹⁷⁵ Biochemical and microbiological research was undertaken to investigate the potential of anaerobic digestion and large digesters were built and operated on the basis of trial and error. By 1966 the NIWR was working on this initiative in close co-operation with the University of California, and one of the South African researchers spent some time at Berkeley working on the problem.¹⁷⁶

The regional laboratory of the NIWR in Windhoek, Namibia, focused on determining what strategies to pursue to secure sufficient water supplies for one of the most arid regions in southern Africa.¹⁷⁷ The region, at the time administered by South Africa but now an independent state, had (and still has) a very low annual rainfall. Local rivers only flow intermittently; they tend to disappear into sandy riverbeds and rarely reach the sea. The NIWR's attempts at securing water in the region also had to contend with rapid evaporation.¹⁷⁸ Researchers began by conducting a qualitative and quantitative evaluation of the available water supplies to provide information for compiling a 'rational' plan for water development in the region.¹⁷⁹ By 1966 significant research had already been done on the Kuiseb, Swakop and Omaruru rivers. They worked on the sub-surface measurement of water flow by tracing the channels that had been eroded into the river beds beneath the surface and had filled up with sand and gravel.¹⁸⁰ Other projects undertaken in the 1960s, included: the solar distillation of brackish water; evaporation control; the preparation of a water map for Namibia;

¹⁷⁴. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 775.

¹⁷⁵. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, pp. 775-780.

¹⁷⁶. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, pp. 775-6.

¹⁷⁷. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 777.

¹⁷⁸. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, pp. 777-778.

¹⁷⁹. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 778.

¹⁸⁰. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, pp. 777-8.

and the development of methods for the beneficiation of mineralised waters containing magnesium, sulphates nitrates and fluorides.¹⁸¹

In the field of marine disposal effluents the NIWR collaborated with the Department of Water Affairs to ensure that effluent could only be released into the marine environment if the necessary permits were issued. For example, municipalities responsible for shedding effluent into the sea had to have special permission to do so and the process had to be closely monitored. The Natal regional laboratory of the NIWR was responsible for working in this field in 1966.¹⁸²

Sewage purification was one of the four major foci of the NIWR in the mid-1960s. The Water Act of 1956 stipulated that water released into the waterways of the country had to comply with certain minimum standards. However, many local authorities were not compliant in this regard. Particularly in the rural areas of South Africa there was a need to construct affordable wastewater treatment works that could do an efficient job of cleaning up the wastewater.¹⁸³ In the same decade the NIWR investigated the possibility of using maturation ponds as a final stage for sewage purification.¹⁸⁴ There were also innovative developments in the field of sanitation, with the institute's researchers producing the prototype of a mobile latrine that worked with aerobic fermentation and was specifically designed for use underground in the mines. A similar type of unit was developed to operate in the domestic sanitary environment.¹⁸⁵

The 1960s drought and the formation of the Water Research Commission

Today, the Water Research Commission (WRC) is the flagship of water research in South Africa. The commission was established in 1971 in the aftermath of the severe drought experienced in many parts of South Africa in the 1960s. The most dramatic manifestation of this crisis was when the water level of the Vaal Dam dropped to 26% of its capacity.¹⁸⁶ In 1966 the government appointed a commission of enquiry under the leadership of Prof. SP du Toit Viljoen. It was tasked to investigate the situation

¹⁸¹. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 778.

¹⁸². JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 779.

¹⁸³. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 780.

¹⁸⁴. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 780-781.

¹⁸⁵. JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 782.

¹⁸⁶. Anon., "Water Research Commission – celebrating 40 years of research excellence" in *Water Wheel*, 10(Special Anniversary Issue), 2011, p. 6.

and make recommendations on the proper management of water across all sectors.¹⁸⁷ The commission's report was published in 1970 and when it reached parliament, the responsible minister, SJP (Fanie) Botha, stressed the importance of generating knowledge on water-related matters. There was also a call for a statutory organisation to take responsibility for this task. Subsequently the *Water Research Act*, No. 34 of 1971, was approved by parliament on 1 September 1971. The first secretary of the WRC was JP Kriel and the ex officio chairperson was GJ Stander, who became the CEO.¹⁸⁸

The WRC's initial activities were confined to the CSIR and some government departments and had a direct bearing on water and the environment.¹⁸⁹ In 1971 the major issues identified for investigation included South Africa's intermittent and insufficient rainfall; the management and practices in catchment areas; the high evaporation rates of the water content of dams, rivers and water canals; uneconomic and inefficient use of water by various sectors; water pollution; insufficient management and the over-abstraction of water; problems with unsatisfactory co-ordination in the water sector; the publication and co-ordination of water research; development work; and the need to address the inadequate training of scientists, engineers and other experts required for the development of South Africa's water resources.¹⁹⁰

The terms of reference for the Water Research Commission also stipulated that the commission had to 'support the application and dissemination of research findings'.¹⁹¹

The research feeding ground of the newly-formed WRC was the CSIR and more specifically the National Institute for Water Research (NIWR),¹⁹² where Dr GJ Stander (1911–1997) was in charge. He was a chemist who had graduated with a PhD from the University of the Witwatersrand dealing with anaerobic digestion for

¹⁸⁷. Anon., "Water Research Commission – celebrating 40 years of research excellence" in *Water Wheel*, 10(Special Anniversary Issue), 2011, pp. 6-7.

¹⁸⁸. Anon., "Water Research Commission – celebrating 40 years of research excellence" in *Water Wheel*, 10(Special Anniversary Issue), 2011, p. 7.

¹⁸⁹. Anon., "Water Research Commission – celebrating 40 years of research excellence" in *Water Wheel*, 10(Special Anniversary Issue), 2011, p. 7.

¹⁹⁰. Anon., "Water Research Commission – celebrating 40 years of research excellence" in *Water Wheel*, 10(Special Anniversary Issue), 2011.

¹⁹¹. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 1.

¹⁹². JG Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 774.

purifying effluents of fermentation industries.¹⁹³ When the Water Research Commission was founded in 1971 he became the first chief executive officer, remaining at the helm of the institution until his retirement in 1979.¹⁹⁴

The start of the Waterlit collection

What was eventually to become the Waterlit collection had its origins at the CSIR library. By the 1960s the CSIR had the largest science and technology library in South Africa. In 1966 the NIWR requested the Information and Research Services (IRS) of the CSIR to develop a broad-based information service on current developments in and awareness of water-related issues. This was to be made available to researchers working in the field of water.¹⁹⁵ The information service had to be current and up to date; have a comprehensive coverage base; and be accessible for information retrieval.¹⁹⁶ One product of this demand for information was the Waterlit Collection. The concept had its origins with Dr Stander. Once he had moved from the CSIR to the Water Research Commission the idea was mooted for the establishment of the South African Water Information Centre (SAWIC).¹⁹⁷ The centre was now responsible for the current awareness distribution system, a service for which there was a significant need in South Africa's water sector.¹⁹⁸

In the early 1970s there was little water-related information dealing specifically with South Africa. International online databases took scant notice of local developments in the water sector. It was also difficult to provide local scientists with suitable information from existing commercial databases.¹⁹⁹ Subscribing to many of the

¹⁹³. Anon., "GJ Stander: a water research pioneer" in *Water Wheel*, 10(Special Anniversary Issue), 2011, p. 9.

¹⁹⁴. Anon., "GJ Stander: a water research pioneer" in *Water Wheel*, 10(Special Anniversary Issue), 2011, p. 9.

¹⁹⁵. PJ Aucamp, "The development of a South African computerised bibliographic data base on water" in *Water SA*, 3(1), January 1977, p. 5.

¹⁹⁶. PJ Aucamp, "The development of a South African computerised bibliographic data base on water" in *Water SA*, 3(1), January 1977, p. 5.

¹⁹⁷. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 1; TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

¹⁹⁸. GC Cillie, P, Coombs, P. and PE Odendaal, "Water pollution in South Africa" in *Journal (Water Pollution Control Federation)*, 51,(3), Part 1, March 1979, p. 464.

¹⁹⁹. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit –past, present and future. Overview of a unique South African product", p. 2.

journals was cumbersome and expensive. The new database largely overcame this problem by making available material free of charge to users.²⁰⁰

By the 1970s it was standard practice for CSIR researchers in the water sector to spend Friday afternoons working in the library. The rest of the week they would be working in their offices or in the labs, or out in the field. Friday afternoons were put aside for researchers to familiarise themselves with what was current in the field of water studies. For many researchers the basic preliminary work done in the library on a Friday afternoon became the reading material at home over the weekend.²⁰¹ Dr Stander's personal library was transferred to SAWIC and it was from these sources that the water researchers were able to gain insight into the fields in which they were working.²⁰²

From the outset, what was to become known as the WLC was seen as a database for researchers working in interdisciplinary contexts. Therefore there was a broad focus, e.g. water studies, had to be developed in order to make current material more accessible for researchers in a variety of fields.²⁰³ At the helm of the project was Dr Pieter Aucamp, a chemist in the agricultural sector. He had done a stint as a researcher at the CSIR from 1966 to 1968 before moving to the former Cape Province where he did research on fungi in the export fruit sector of the Western Cape. He later returned to the north where he worked at the department of health and also the former ISCOR, before joining the staff at the Pretoria Technikon. His appointment on the Waterlit project was largely influenced by the fact that he was an experienced CSIR staff member and was familiar with the way the CSIR operated.²⁰⁴

Computer-based library information systems in South Africa

By this time the CSIR library had become the most important of its kind in South Africa for science and technology. It boasted outstanding publishing services; language and translation services; a publicity and public relations division; and liaison offices in London, Washington and Cologne. For statistical services the library relied on the National Institute for Mathematical Sciences.²⁰⁵ The CSIR was also well connected in the field of library information sciences. Computers were first used in the early 1960s in the library environment in the United States of America. Shortly thereafter the first articles on the use of computers in the library appeared in South

²⁰⁰. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²⁰¹. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²⁰². TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²⁰³. PJ Aucamp, "The development of a South African computerised bibliographic data base on water" in *Water SA*, 3(1), January 1977, p. 5.

²⁰⁴. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²⁰⁵. GJ Stander, "Water pollution research: a key to wastewater management" in *Journal (Water Pollution Control Federation)*, 38(5), May 1966, p. 775.

Africa. At what is today the Nelson Mandela Metropolitan University (NMMU), formerly the University of Port Elizabeth, in 1967 catalogue cards were first replaced by flexowriters (paper punch tape). The University of South Africa (UNISA), the University of Johannesburg (formerly the Rand Afrikaans University) and the CSIR's experimental periodicals administration system began similar systems in 1969.²⁰⁶

The South African National Bibliography (SANB), a project introduced by the State Library in Pretoria, was started as part of a collaborative initiative between the University of the Free State and the Zentralstelle für Maschinelle Dokumentation in Frankfurt, Germany. It was one of the first national bibliographies to be turned into an electronic database.²⁰⁷ In 1983 the South African Bibliographic Information Network (Sabinet) was established with the objective of providing computerised bibliographic data to users in the country.²⁰⁸

The WLC and computer-based information science

Those involved in the planning of the WLC in the early 1970s worked towards a computer-based system. The concept they decided upon was based on the Keyword-in-Context (KWIC). The method had already been tested and there was evidence as early as 1960 that it worked well to create awareness and provide dedicated information to users.²⁰⁹ This same system was extended to the service provided for those involved in water research. It is clear that the librarians and computer scientists working on the development of the database that became the Waterlit Collection made thorough cross-checks to prevent duplication of material retrieved from different databases.²¹⁰ The information scientists also decided to bring in a database, the Literature on Water (CLOW) that contained most of the information required for making the standard information on water available in print. Consequently, CLOW which had been operational in other divisions, with data dating back to 1971, served a useful purpose.²¹¹ Furthermore, WAAF, a database used at the

²⁰⁶. M Botha, "In Africa semper aliquid novi?" in *Proceedings of the IATUL Conferences*, Paper 18 IATUL Proceedings 1991(Purdue University, Purdue ePubs), p. 93.

²⁰⁷. M Botha, "In Africa semper aliquid novi?" in *Proceedings of the IATUL Conferences*, Paper 18 IATUL Proceedings 1991(Purdue University, Purdue ePubs), p. 93.

²⁰⁸. M Botha, "In Africa semper aliquid novi?" in *Proceedings of the IATUL Conferences*, Paper 18 IATUL Proceedings 1991(Purdue University, Purdue ePubs), p. 93.

²⁰⁹. PJ Aucamp, "The development of a South African computerised bibliographic data base on water" in *Water SA*, 3(1), January 1977, p. 5.

²¹⁰. PJ Aucamp, "The development of a South African computerised bibliographic data base on water" in *Water SA*, 3(1), January 1977, p. 6.

²¹¹. PJ Aucamp, "The development of a South African computerised bibliographic data base on water" in *Water SA*, 3(1), January 1977, p. 7.

department of water affairs, was also incorporated.²¹² By 1974/5 an information distribution system, responsible for computerised dissemination of abstracts and science report notifications was developed by Dries Durand and Margaret Lotter. It was known as the South African Selective Dissemination of Information (SASDI). The system provided a computer-based service in the library and this paved the way for a more dedicated and rapid bibliographic access to source materials.²¹³

The formal production of the Waterlit database began in 1975 and within a year 5 670 items had been indexed.²¹⁴ Compiling a database was cumbersome work. The Waterlit database was maintained along with a number of smaller in-house CSIR databases on an IBM370/158 mainframe computer. The indexing was done by hand in pencil on specially designed coding forms. Typists would then key in the information on a temporary database through text-editing video editing terminals in a central location. This material was processed weekly in batches. Finally, every three months the information that had been compiled in this painstaking manner was downloaded onto magnetic tape for the SDI service system. As the workload increased the periodic downloads were made once a month.²¹⁵

The amount of manual work was enormous. The information system on researchers in the country was hand-typed and literally tippexed if there were any errors in the text that required correction. People did not have personal computers²¹⁶ so it was accepted that copies of material for the researchers would go out as hard copies by 'snail' mail. Of vital importance was the bibliographical database on the datacards.²¹⁷ In the 1980s the indexing went from datacards to dumb terminals. If you wanted a field broadened it was a great effort. There was, however, a high-quality control system. Three people conducted regular checks as a form of quality control.²¹⁸

The system changed in due time to one that depended on a team of women working from home in many parts of South Africa and even overseas. They meticulously

²¹². WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 2.

²¹³. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²¹⁴. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 2.

²¹⁵. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 3.

²¹⁶. TOA 20130703, James, T. Menlo Park, Pretoria.

²¹⁷. TOA 20130703, James, T. Menlo Park, Pretoria.

²¹⁸. TOA 20130703, James, T. Menlo Park, Pretoria.

indexed data for what was to become one of the most comprehensive water biographies of the twentieth century.

By 1995 the WLC database was running on the UNIX system. The transfer to the new system implied that SAWIC staffers had to spend a great deal of time on the transfer of the data. The major advantage of the new system was that it enabled the staff to routinely access the data on the WLC and update records and make corrections directly on the system. In former times this type of work was most time-consuming.²¹⁹ By 1998 the WLC was running on a Unix-based SPARC 20 computer system, with a Cuadra and Star/Web retrieval system. The system was relocated in the course of 1997 and accommodated in an area where access was limited.²²⁰ The data was backed-up daily using marked tapes, with some of the tapes stored off-site. The backup process was run overnight so as to cause as little disturbance as possible to web users. In the daily process of running the backup it was necessary for a one-hour shut down.²²¹

Factors that influenced the formation of the WLC

In the early 1970s South Africa did not feature prominently in the international sphere of scientific literature on water. The available worldwide databases had hardly any information on South Africa. There was simply no easy way of providing researchers with satisfactory information on water related matters beyond the country's borders. At the time water researchers at the CSIR basically had to rely on two databases. These were CLOW (compiled by the Institute for Water Research at the CSIR) and WAAF (compiled by the department of water affairs).²²² Although these were relatively small collections, when they were consolidated, the amount of accessible material tended to increase substantially.

South Africa's political isolation escalated in the early 1960s after the Sharpeville incident and the hardening of the government's apartheid policies. This isolation had ramifications in the field of science and technology research and international communication. According to one respondent, Dr Pieter Aucamp, there were hardly any actions taken against South Africa in the scientific arena in the 1960s and

²¹⁹ WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 7.

²²⁰ WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 6.

²²¹ WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 6.

²²² WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 2.

1970s.²²³ It was only in the 1980s that political isolation loomed large and the country was increasingly marginalised from what was going on in the field of science. However, South Africa's water sector researchers continued to enjoy meaningful collaboration with overseas contacts and were not entirely excluded from the international scene.²²⁴ It was also possible for information science experts, with input from water researchers, to make significant relevant additions to the collection.

In money terms, the development of the WLC was a very costly initiative. But in her final report on the collection Ms Martha Pretorius indicated that its real value was inestimable. She explained that over a period of 25 years, at a time

... when South African researchers were suffering under an international boycott which also included the availability of scientific information, Waterlit assisted local researchers to keep up to date with international research results.²²⁵

The fact the collection was located in South Africa also saved researchers money and time. They no longer needed to order materials from overseas. She went on to explain that

For the WRC the return on their investment lies in the excellent products and high quality research results achieved by the local water research community through the assistance of a database of international standing and quality.²²⁶

The strength of the WLC lay in the fact that a substantial amount of research was focused on South African conditions. Furthermore, the collection's wealth of information on specific themes, such as ocean sewage outfall pipelines, made it particularly useful for local researchers.²²⁷ Another aspect of the collection that was geared to local conditions was that some classifications (for example including estuaries as freshwater supplies, rather than part of the marine environment),²²⁸ made the collection particularly suited to South Africa, one of the more arid regions

²²³ . TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²²⁴ . TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²²⁵ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

²²⁶ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 8.

²²⁷ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 2.

²²⁸ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 2.

of the world where all potential freshwater supplies were brought into the ambit of potential useful resources.

Issues in water research in the early 1970s

When the WLC first came into use, one of the major issues the country faced was dealing with South Africa's available water supplies. In 1970 the commission of enquiry into water matters had delivered its report to the government and there were concerns that the relevant authorities might not have the ability to meet the growing demand for water. The drought conditions of the 1960s were still fresh in the minds of officials at the department of water affairs. Among the most pressing challenges they faced was to devise a sound water transfer system in central South Africa. Another was to investigate the potential of recycling water. There were also emergent problems with the water in the Hartbeespoort Dam where the spread of algae was causing concern.²²⁹ Stander, a specialist in water purification, at the CSIR, explained that scientists were well aware that the water was being contaminated. The challenge was for them to address the problem.²³⁰

The management of the WLC

The WLC was a product of the South African Water Information Centre (SAWIC). In essence, SAWIC's responsibility was to create awareness and make information on water and water-related research available to interested stakeholders in South Africa and overseas. To a large extent, being situated in the CSIR complex, the SAWIC had a strong science and technology focus. The Water Research Commission funded the development of the WLC. This arrangement was based on an agreement with the CSIR's SAWIC for the compilation of the database and was periodically renewable. Because most of the funding for the collection came from the WRC, a steering committee met once a year at the offices of the Water Research Commission where the current manager of the WLC project reported on the activities of the past year. From these reports, many of them justifying the need for more staff to organise and systematise the WLC, it becomes clear that what at first started out as a typical library-type project, soon increasingly became a high-technology operation featuring a database that could be searched with the help of a comprehensive thesaurus on material available in the collection.

The documentation of meetings held by the steering committee of the South African Water Information Centres is incomplete. There is no trace of the minutes for the very early meetings. The documents received from the offices of the Water Research Commission in September 2013 are also incomplete; those on the meetings held

²²⁹. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

²³⁰. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

between 1983 and 1984 are missing. However, for the rest, the WRC K6/1/0/1 collection of documents that is to be organised as the SAWHAR archive on the WLC in 2014, is comprehensive and provides an interesting historical picture of the work done in the compilation of the WLC.

At the WRC, Mr Thys Pieterse was responsible for the WLC. He had been involved in the project from the start.²³¹ At the CSIR, Morkel Steyn was in charge. Ms Tina James later took over from Steyn in 1986 and then left the WLC at the end of November 1990 to transfer to the CSIR's environmental services division. Her place at the helm of the collection was taken over by Angela Rethman.²³²

In 1994 there was an extended discussion on the role of the WRC in respect of SAWIC and the WLC. Mr AG Reynders, the chairman of the meeting explained that SAWIC could not continue to function simply as an exclusive WRC project. Instead it had to be contemplated from the perspective of a centre that merely rendered a broad service to all WRC research projects. For the WRC it was important to determine how cost effective SAWIC was and if it would be possible to consolidate some of its services with other water databases.²³³ In essence, the discussion revolved around the issue of having to pay for services. The WLC manager, Ms Rethman, tried to rescue the situation by pointing out that while it was true that there had been resistance to payment for services, consideration had to be given to the differentiated tariff approach.²³⁴ There was also another factor. The transition to a new South Africa implied that significant managerial shifts were on the cards. By 1994, when all the water-related projects of the WRC were made known, the WRC as leading stakeholder in SAWIC started driving the point home that its researchers and project managers had to be allowed access to the WLC database. It clearly was assumed that access to the WRC should be free of charge.²³⁵ By 1995 information on no less than 464 water research projects were listed in the database.²³⁶ At the same time SAWIC was responsive to the demand of the WRC that its researchers be given the right to access the WLC database. In 1995, 42 requests were submitted for CD-ROMs of the

²³¹. TOA 20130703, James, T. Menlo Park, Pretoria.

²³². WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria., 18 July 1991, p. 1; WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 1.

²³³. WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fourth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 19 July 1994, p. 5.

²³⁴. WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fourth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 19 July 1994, p. 5.

²³⁵. WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 14.

²³⁶. WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 7.

WLC database.²³⁷ The WRC, as the major sponsor of the WLC, had managed to secure for itself the right to extract information for its researchers, who had for many years relied on the WLC-database for information.

The WLC project made a courageous move towards embracing South Africa's new political dispensation in 1994. Ms Tina James, who had shortly before been promoted to project manager at the CSIR, told the SAWIC steering committee for the WLC database that the institute had a significant role to play in the government's reconstruction and development plan (RDP). Considerable work had been put into developing SAWIC and the quality of research could be useful to the government.²³⁸ In the meeting, some of the members of the committee pointed to the value that SAWIC could add in terms of community water supply services.²³⁹ Ms Rethman, until she moved on to another position in the CSIR, kept in touch with the Department of Water Affairs and Forestry to negotiate on matters of how the WLC database could be of use to the directorate in terms of dealing with community water supply and sanitation.²⁴⁰ Tina James, who had also kept an eye on the WLC database as a senior manager at the CSIR was in a good position to advise the staff on matters related to development and the environment.²⁴¹ She proved to be a valuable adviser. By 1995 significant headway had been made in the construction of the WLC database so that it could give greater attention to matters of relevance for the government's RDP initiative. Links were also established with other developing countries to locate new sources of information.²⁴²

Meanwhile, SAWIC had also established contact with the Standing Committee on Water and Sanitation (SCOWSAS) in an effort to provide support for the RDP initiative.²⁴³ SCOWSAS was an important committee that had been working since the early 1990s on formulating the future government's water policies. A notable feature of the work done by SCOWSAS was to ensure that more people, especially those who were previously disadvantaged, would have access to proper drinking water and

²³⁷ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 7.

²³⁸ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fourth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 19 July 1994, p. 4.

²³⁹ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fourth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 19 July 1994, p. 5.

²⁴⁰ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fifth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 7 August 1995, p. 3.

²⁴¹ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 1.

²⁴² . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 4.

²⁴³ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 4.

sanitation services. SAWIC therefore placed itself at the service of SCOWSAS in an effort to position itself and its staff for post-apartheid South Africa.

In 1995, Ms Martha Pretorius took over from Angela Rethman as manager of the WLC. Rethman had been promoted to another division in the CSIR.²⁴⁴ James, by now a senior CSIR information manager, fought hard to keep the WLC together. Then, in 1997, she convinced the WRC to take the collection back.²⁴⁵

The transfer of the WLC from the CSIR to the WRC created a number of problems. For example in early 1997 a number of SAWIC staff were transferred from the CSIR to the WRC and in the process, two experienced data indexers had to be moved to the physical collection to help with co-ordination; doing quality control; and taking responsibility for backing-up the system. Initially these indexers did these tasks in addition to the data capturing they had been responsible for all along. However, by 1998 they were given additional tasks, such as training people and also implementing the WLC's new thesaurus.²⁴⁶ The transfer of the WLC to the WRC began to have a negative effect on the number of items added to the database. See Table 1.

²⁴⁴ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fifth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 7 August 1995, p. 1.

²⁴⁵ . TOA 20130703, James, T. Menlo Park, Pretoria.

²⁴⁶ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 2.

Table 1 Drop in the performance of data capturing in the process of the WLC's transfer from the CSIR to the WRC²⁴⁷

Year	Number of titles added per annum	Average monthly additions
1993	16633	1386
1994	16759	1396
1995	14656	1221
1996	16019	1335
1997	18262	1522
1998	6381	1276

In 1997 Ms Martha Pretorius made a submission to the SAWIC steering committee suggesting that the WRC should take the lead in the process of establishing a network for libraries and information centres dealing with water and marine information.²⁴⁸

In July 1998 the first meeting of the steering committee for the development of the Waterlit database, now at the WRC, was held in Pretoria. In effect, this committee was, for members of the new committee, in large part a continuation of the South African Water Information Centre (SAWIC) that had been established earlier by the CSIR, to support researchers with a current awareness programme.²⁴⁹

Most of the working time of the WLC team was spent in collaboration with their former CSIR colleagues to set up the WLC database on the internet.²⁵⁰ In view of all the changes that had taken place, as well as the need to maintain the WLC system, the WRC's WLC team indicated in 1998 to the WLC steering committee that it intended to control and manage all the WLCs database activity. It was at the same time expected of the WRC to grant permission for access to the journals that the indexers had to register on the WLC. The WRC was now also responsible for prescribing the quality standards for the WLC; indexing policy; and the terminology and selection policy the WLC database was going to pursue. A single indexer was

²⁴⁷ WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 2.

²⁴⁸ WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 3.

²⁴⁹ WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 1.

²⁵⁰ WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July 1997-30 June 1998, p. 1.

appointed to take charge of all the internet material that could be indexed on the database. The understanding was that trained indexers would still be used for capturing the data; and that indexers would provide their data to the WLC team in an electronic format.²⁵¹

In July 1999 the WRC's Martha Pretorius was responsible for the WLC at the WRC. The WRC did not accept an earlier offer by the CSIR to continue adding to the existing database. That service came to an end in June 1999.²⁵² The plan was for the WRC to start a decentralised system of qualified and trained indexers in a variety of fields who would make contributions to the WLC database. A number of discussions had taken place with qualified and trained indexers at the Life Sciences Library of the University of Natal (currently UKZN), and the general library at the University of Stellenbosch.²⁵³ Indexers in the employ of the CSIR at the time were given the opportunity to secure employment at the WRC under the new system. Libraries participating in the system agreed that they would allow indexers access to the publications they held in their respective libraries. Individual indexers were to be provided with lists of journals that had to be indexed. The indexers were also encouraged to index additional journals, as well as other publications, such as conference proceedings and reports.²⁵⁴

The indexers were to use their own computers and had to send their work by email to the database manager at the WRC. It was also required, in terms of the contract agreements with the indexers at the various libraries, that they would abide by the internal policy and system of rules laid down by the WRC.²⁵⁵ The WLC database, it was agreed, would give recognition to the library where all the indexed documents were held. That particular library would be recognised as the legal owner of the document. The understanding was that requests for documents would then be

²⁵¹. WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July 1997-30 June 1998, p. 5.

²⁵². WRC K6/1/0/1 Final meeting of the steering committee for the project: Waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 6.

²⁵³. WRC K6/1/0/1 Final meeting of the steering committee for the project: Waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product, p. 6.

²⁵⁴. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", pp. 6-7.

²⁵⁵. WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

referred to the specific libraries where they were held.²⁵⁶ Also part of the agreement was that individual libraries could generate an income for themselves by supplying the records to Waterlit users.²⁵⁷

Over a period of several months, Ms Pretorius visited libraries in Pietermaritzburg, Stellenbosch, Cape Town and Bloemfontein to secure a pledge for support and collaboration. Individual indexers who volunteered to join the proposed service were evaluated in the process.²⁵⁸ She had also held meetings with international stakeholders in the field of water studies. By 1998 she had held talks with the president of the International Association of Aquatic Marine Science Libraries and Information Centres (IAMSLIC) about the WLC. An agreement was reached that a South African chapter of the association would be created and that closer ties and collaboration would be promoted between IAMSLIC and the WLC.²⁵⁹

At the time it was also foreseen that the focus of the WLC should be broadened. For example there was a gap in agricultural research which required attention and the libraries of the University of Pretoria and the University of KwaZulu-Natal were identified as having sufficient sources in the field of agriculture to remedy this shortfall.²⁶⁰ A new specialised division of themes and dedicated research foci were also devised to upgrade the collection. This included material from the Institute of Polymer Science at the University of Stellenbosch; the Groundwater Department at the University of the Western Cape; the Weather Bureau in Pretoria; the national department of health and several other institutions.²⁶¹

²⁵⁶ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

²⁵⁷ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

²⁵⁸ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

²⁵⁹ . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 2.

²⁶⁰ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

²⁶¹ . WRC K6/1/0/1 Final meeting of the steering committee for the project: Waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 7.

Ultimately, the WLC had to close its hard copy library at the WRC in Pretoria, when the collection was transferred to Rhodes University in Grahamstown. It remained there for a number of years before being transferred to the WRC in Pretoria. In 2013 the WLC was handed over to the North-West University's Vaal campus in Vanderbijlpark, on the banks of the Vaal River, where the collection now forms the centrepiece of the South African Water History Archival Repository.

Central themes in the evolution of the WLC

Although part of the success story of the WLC can be directly linked to the formidable history of South Africa's water sector research since the 1970s, there is another discourse that perhaps deserves greater attention for the purposes of this discussion.

The WLC was developed in an era of major breakthroughs in the field of information technology. Computerised library systems, operating on mainframes shifted into place at the end of the 1960s. By the 1970s the information technology field created opportunities for the development of electronic catalogues operated from comprehensive databases located on mainframe computer systems. In the 1980s capturing data and developing appropriate software was a major step forward. Ultimately the objective was to link up comprehensive databases with the emergent personal computer (PC) wave that soon escalated into a revolution that was driven, in South Africa from the 1990s, by internet-based technology.

The manner in which the WLC team of librarians and information science specialists, computer specialists and researchers, collaborated in addressing many of the challenges which arose, forms an intriguing narrative on human innovation and the need for developing systems of knowledge. This remarkable joint effort ultimately led to the creation of a hardcopy collection of information summarised on an electronic database that would eventually become the largest of its kind in the world.

Data capturing for the WLC

Between June 1981 and July 1982 a total of 11 714 items were indexed of which 514 came from the directorate of water affairs. The growth rate of titles in the WATERLIT Collection (WLC) reached 6,4 per cent per annum, a remarkable achievement.²⁶² By 1982 the indexing process had been significantly improved by simply employing an indexer who worked from home and was paid per item that she indexed.²⁶³ Another advance made in 1982 was the indexing of 540 journals. By

²⁶². WRC K6/1/0/1 Vol. 1, SAIW 5/82. Vorderingverslag Julie 1981 – Junie 1982, p. 1.

²⁶³. WRC K6/1/0/1 Vol. 1, SAIW 5/83 Herindeksering van National Technical Information Service (NTIS) verslae (1982), p. 1.

comparison, in the previous year the maximum number of journals indexed was 460.²⁶⁴

In 1984 SAWIC had an indexer working from home for WLC. She was living in Cincinnati in the United States of America and used the library of the Environmental Protection Agency (EPA) of the United States. She was Ms Tina James, a former employee of the South African Institute for Water (SAIW),²⁶⁵ who later stood at the helm of the WLC. Her husband, Chris James, was at the time the holder of a Fulbright scholarship to study music at the University of Cincinnati. While her husband pursued his studies Ms James made use of the opportunity to sit in the library of the Environmental Protection Agency (EPA), where a great deal of work was being done on water quality. She keyed in the latest information from research publications and then once a week sent off a parcel to the South African Embassy in Washington DC, from where the information would be sent to South Africa.²⁶⁶ The details of up-to-date research findings in the USA would thus reach South African shores long before the hard copy arrived in South Africa.²⁶⁷

For the WLC users the database was essentially a catalogue of materials on a great variety of themes related to water. They consulted the WLC for references, but then they had to apply for the material through their local libraries. In many cases, as a result of the unique nature of the information in the WLC few local, government or university libraries had the material available. This meant that most of the material had to be ordered from the documents delivery service of the CSIR's National Institute of Informatics (NII), also known as part of the national inter-library loan system.²⁶⁸

To all intents and purposes the WLC was a survey of knowledge for the development of the South African water system. It was ostensibly intended for engineers and water researchers. The databases were not available to anybody else. Those who needed information called the CSIR to get in touch with the library staff of the WLC who would then provide the necessary information. All the searches were done electronically, but the material was selected by hand from the hard copy data and then sent to the researchers who had made the request. Conducting searches for researchers would cost the researcher several hundred rand.²⁶⁹

²⁶⁴ . WRC K6/1/0/1 Vol. 1, SAIW 6/83 Vorderingsverslag Waterlit (1982), p. 1.

²⁶⁵ . WRC K6/1/0/1 Vol. 1, 3/85. Notule van die veertiende vergadering van die loodskomitee van die Suid-Afrikaanse inligtingsentrum vir water, 1984.09.06, WRC, Pretoria, p. 5.

²⁶⁶ . TOA 20130703, James, T. Menlo Park, Pretoria.

²⁶⁷ . TOA 20130703, James, T. Menlo Park, Pretoria.

²⁶⁸ . WRC K6/1/0/1 Vol. 1, SAIW 6/85. Vraelyste aan WATERLIT-gebruikers: Anon., Summary of the responses obtained from the questionnaires sent to Waterlit users in November 1984, p. 3.

²⁶⁹ . TOA 20130703, James, T. Menlo Park, Pretoria.

Indexing the WLC

Indexing proved to be one of the major obstacles. The WLC administrators were using home indexers and by 1982, for the first time, they reached more than 1 000 items indexed per month.²⁷⁰ Journals would come in to the CSIR and the WLC administrators immediately intercepted the material even before it reached the water researchers. The material would be with the staff for a week after which it was sent off to the indexers. Within a week the material would be returned and was then returned to the library for general use.²⁷¹

Indexers, who had to have some knowledge of the field of water studies, were trained for period of four to six months. They were then given instruction on how to conduct a search. Boolean logic, which is a complex process, was used. In 1989 indexers attended workshops every two months at the CSIR and they listened to guest speakers who spoke on a number of specialised topics. The seminars were usually followed by an indexing workshop where the indexers were encouraged to discuss any problems they were experiencing.²⁷²

By 1988 the number of articles entered into the WLC began to decline. This was because of changes in the personnel and the cancellation of certain articles that formed part of the WLC. There was a backlog of the information contained in pamphlets and conference proceedings, but with the journals there was no backlog because this information was constantly updated.²⁷³ By 1992 it was standard practice for the indexers to enter at least 1 000 titles per month. Interestingly, the indexing process had become much more complex and detailed with indexers now working on PCs.²⁷⁴ In 1997 a record number of items were added to the WLC – a record-breaking 18 262 items – which meant that on average 1 276 new titles were listed on the system per month.²⁷⁵ By May 1998 the total number of items on the database reached 291 965.²⁷⁶

In 1989 the WLC-database team experimented with an outside company to help the indexers develop sufficient skills in the use of computers. The team members participated in some of these training sessions. However, there was consensus

²⁷⁰. WRC K6/1/0/1 Vol. SAIW 6/82. Werkprogram 1982-83, p. 1.

²⁷¹. TOA 20130703, James, T. Menlo Park, Pretoria.

²⁷². WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p.1.

²⁷³. WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 4.

²⁷⁴. WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 3.

²⁷⁵. WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 2.

²⁷⁶. WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 2.

amongst them that the training provided was not up to standard. They therefore developed an in-house training course for indexers and people interested in making use of the WLC.²⁷⁷ By 1990 the staff of the WLC database had built up significant skills in the field of IT and databases in particular. Members of the group were involved in presenting training courses in the field of indexing; thesaurus construction; and abstracting. They also started a special training course on Q&A software.²⁷⁸

By 1994 there were 10 home indexers working on the WLC. All of them had appropriate tertiary scientific qualifications and had been exposed to extensive training in the field of computer programmes.²⁷⁹

Focusing on the users

From the outset the WLC team at SAWIC attached considerable importance to determining who their users were and precisely what they wanted from the system. Profiles of the users varied. There were engineers, hydrologists and water quality researchers. Others were involved in various different disciplines and were in search of something water-related in their field of focus. It appears that considerable attention was focused on wastewater, industrial water, sanitation and sewage. In the WLC database the system had to be diverse and to accommodate many fields of expertise. A major focus was hydraulics, but in many cases there were grey lines;²⁸⁰ diversity was the order of the day.²⁸¹

In the early 1980s the WLC had 194 user profiles. The staff cleaned the system in 1981/2 and added 40 members, but also eliminated the same number. On the whole, the growth of profiled users had only increased by 28 per cent.²⁸² By 1982 there was significant cynicism about using the system of profiling WLC users, some of whom did not make regular use of the service. Others did not care to communicate with the WLC staff. Consequently considerable 'dead wood' was removed from the system and some 40 new users were added.²⁸³ There appeared to be a gradual increase in the

²⁷⁷. WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 2.

²⁷⁸. WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 14.

²⁷⁹. WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 2.

²⁸⁰. TOA 20130703, James, T. Menlo Park, Pretoria.

²⁸¹. TOA 20130703, James, T. Menlo Park, Pretoria.

²⁸². WRC K6/1/0/1 Vol. 1, SAIW 5/82. Vorderingverslag Julie 1981 – Junie 1982, p. 1.

²⁸³. WRC K6/1/0/1 Vol. 1, SAIW 3/83 Notule, twaalfde vergadering van die loodskomitee van die SAIW, 1982.10.21, WNK, Pretoria, p. 3.

number of profiled users and the expectation in 1982 was that it could well increase in the foreseeable future to more than 230 registered users.²⁸⁴

In November 1984 a total of 244 questionnaires were sent to users of the WLC. Of these, 67 per cent responded. From the information gained it was evident that it was important to market the WLC and the most relevant marketing place was at conferences.²⁸⁵ Almost 90 per cent of the respondents were satisfied with the serviced rendered by the WLC, but some users expressed dissatisfaction, saying that more than 50 per cent of the information they received proved useless for their specific purposes.

Following this feedback the WLC report suggested that more keywords should be introduced.²⁸⁶ It was also deemed necessary to update the profiles of users more frequently. By 1984, it appeared that as many as 27 per cent of users' profiles were not up to date.²⁸⁷ The users indicated that the inclusion of abstracts would be of substantial value in the search process, so in the report it was stressed that attention had to be given to the inclusion of abstracts into the database. At the time almost two thirds of all the material catalogues in Waterlit had abstracts,²⁸⁸ but this number was duly increased. An analysis of the WLC users in 1990 clearly identified the groups that made most use of the collection.

²⁸⁴ . WRC K6/1/0/1 Vol. 1, SAIW 6/83 Werksprogram 1983-84, pp. 1-2.

²⁸⁵ . WRC K6/1/0/1 Vol. 1, SAIW 6/85. Vraelyste aan WATERLIT-gebruikers: Anon., Summary of the responses obtained from the questionnaires sent to Waterlit users in November 1984, p. 1.

²⁸⁶ . WRC K6/1/0/1 Vol. 1, SAIW 6/85. Vraelyste aan WATERLIT-gebruikers: Anon., Summary of the responses obtained from the questionnaires sent to Waterlit users in November 1984, p. 1.

²⁸⁷ . WRC K6/1/0/1 Vol. 1, SAIW 6/85. Vraelyste aan WATERLIT-gebruikers: Anon., Summary of the responses obtained from the questionnaires sent to Waterlit users in November 1984, p. 2.

²⁸⁸ . WRC K6/1/0/1 Vol. 1, SAIW 6/85. Vraelyste aan WATERLIT-gebruikers: Anon., Summary of the responses obtained from the questionnaires sent to Waterlit users in November 1984, p. 2.

Table 2 Category links of profiled users of the WLC July-1989 to June1990²⁸⁹

Institutional links	Profiles users
WATERTEK	27
Industry	31
Individuala	3
EMATEK	3
Municipality	8
CSIR(other)	1
DWA	16
Academic	81
Museums	2
Government	9
WRC	2
Student full-time	4
Student part-time	17
Total	204

By 1990, 22 per cent of all the topics consulted had a bearing on limnology; 12,6 per cent on wastewater and effluents; 12,5 per cent on hydrology; and 9,2 per cent on aquaculture.²⁹⁰ Over a period of three years, between 1988 and 1990 the above-mentioned topics were the most consulted titles on the WLC database.²⁹¹

By 1990/1 the number of subscribers to the WLC collection increased significantly.²⁹² The spectrum was essentially about 50 per cent educational institutions; 20 per cent government; 15 per cent CSIR; and 15 per cent from the private sector.²⁹³ The areas

²⁸⁹ . Based on James report 1990. See WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p

²⁹⁰ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 6.

²⁹¹ . See table WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 6.

²⁹² . WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 3.

²⁹³ . WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 3.

most widely searched for information were: i) limnology; ii) wastewater, effluents; iii) aquaculture; iv) hydrology, meteorology, climatology; and v) catchments.²⁹⁴ There were clearly times when researchers were working on very specific themes in which case specific keywords would be used. This was evident in 1992 when there was a drop in the number of items searched under the heading of limnology.²⁹⁵

As a result of the revolution in personal computers, the vast advances made in development of the internet, as well as the availability of other media where users could not actually be traced, the user focus of the database operators tended to decline in importance. One obvious reason behind this was that it was no longer necessary to part with one's money to receive information.

Developing a thesaurus

The Waterlit thesaurus was described on occasion by a former WLC-researcher, as 'a shattering project'. Originally it was started at the CSIR on a software programme from the UK that was unable to process the vast amount of data listed in the WLC.²⁹⁶ Over the years information scientists had fed more than 100 000 terms into the thesaurus, but the process was relatively primitive in the 1980s. At first the work was done on dumb terminals and IBM. The biggest problem was keeping track of the articles.²⁹⁷

In 1984 the thesaurus was updated and all those who asked for copies received the latest edition. The recipients included users of the WLC and the indexers. Meanwhile an agreement between SAWIC and the Department of Water Affairs, as well as some other state operators, ensured that certain terms that were not water related were also included in the WLC.²⁹⁸ The thesaurus was developed as an in-house software programme in an effort to secure access to the comprehensive list of sources in the WLC. At one stage there were as many as 400 people working in the division. The feedback SAWIC received from the researchers who made use of the system was very positive.²⁹⁹

By 1989 the thesaurus was once again updated. Checks had been carried out and a number of errors in the system had been removed. The WLC-database team had added new terminology and were able to provide the database with a proper

²⁹⁴. WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 5.

²⁹⁵. WRC K6/1/0/1 Vol. 1, Minutes of the twenty-second meeting of the steering committee of the South African Water Information Centre, Infotek Centre, CSIR, Pretoria, 20 July 1992, p. 4.

²⁹⁶. TOA 20130703, James, T. Menlo Park, Pretoria.

²⁹⁷. TOA 20130703, James, T. Menlo Park, Pretoria.

²⁹⁸. WRC K6/1/0/1 Vol. 1, 3/85. Notule van die veertiende vergadering van die loodskomitee van die Suid-Afrikaanse inligtingsentrum vir water, 1984.09.06, WRC, Pretoria, p. 4.

²⁹⁹. TOA 20130703, James, T. Menlo Park, Pretoria.

introduction and a professional layout.³⁰⁰ In 1994 the thesaurus was still being used consistently and was regularly updated. It was described as one of the most valuable sources for accessing the WLC.³⁰¹ The thesaurus was also added to the WLC-database CD-rom in 1994.³⁰²

As late as 1998 the thesaurus was subject to adjustments. In 1997 the CSIR team began converting the content of the WLC's thesaurus to an updated version. The database had to be converted from the Questans software it had been running on to the new Cuadra Star software. This meant that the material on the database had to be changed to coincide with the new thesaurus. It also implied extensive checking and evaluation and there were a number of thorough and accurate management procedures that had to be followed.³⁰³

Materials in the WLC

Since the establishment of the WLC in the 1970s, journals had formed an important part of the content. However, in 1989 the number of journals covered by the WLC decreased from 471 to 452. This was as a result of the cancellation of certain journals that were deemed to be of less essential to the WLC.³⁰⁴ Despite this decrease in journals, the number of articles that were added to the database did not decline.³⁰⁵ One reason for this was that the WLC team had also started adding titles from the Fishlit database to the WLC. The WLC also indexed articles for the department of water affairs.³⁰⁶ The following details shed some light on the trends in journal articles being indexed.

Table 3 Journal articles indexed 1987-90³⁰⁷

³⁰⁰ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 1.

³⁰¹ WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 13.

³⁰² WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 13.

³⁰³ WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 7.

³⁰⁴ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 2.

³⁰⁵ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 2.

³⁰⁶ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 2.

³⁰⁷ Table based on data provided in the James report of 1990. WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 2.

Year	Number of articles indexed
1987	11 555
1988	10 506
1989	13 113
1990	12 953

By 1991 the number of journals received continued to drop and the new manager of the WLC, Ms Angela Rethman suggested that journals be exchanged between institutions.³⁰⁸ However, in terms of indexing titles there was a steady increase again with 14 153 items indexed.³⁰⁹ The fact that the indexers had started working from their own PCs initially made the process somewhat slower, but indications were that it would speed up in the near future.³¹⁰ In 1993 there was another increase in the output of titles indexed. Furthermore the system of exchanging material between institutions made it possible for the WLC team to ensure that all essential titles and items could be secured for the database.³¹¹

Articles in academic journals continued to form the bulk of the material taken up annually in the WLC database. The spread of content for the period 1993/4 is shown in Table 4 below.

Table 4 Breakdown of items indexed in the WLC database in 1993/4³¹²

Items	Number	% of total
Journal articles	12 553	77,66
Conference articles	3 045	18,85
Reports	225	1,39
Book chapters	163	1,00

³⁰⁸ WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 5.

³⁰⁹ WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 2.

³¹⁰ WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 2.

³¹¹ WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 2.

³¹² WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 6.

Items	Number	% of total
Conference proceedings	89	0,55
Report sections	52	0,32
Pamphlets	24	0,15
Books	10	0,06
Theses	3	0,02

In 1998 the steering committee acknowledged that 'grey' literature, such as conference papers, unpublished reports and similar materials not formally published, was of substantial significance for the WLC despite being described as 'unpublished'.³¹³ This 'grey' literature did indeed have significant value, largely because it was an area of information that few other databases would have. The whole object of the exercise was to ensure that additional (although somewhat obscure) material could be made available to researchers and the service could be rendered on a customised basis.³¹⁴

Database quality control and improvement by the CSIR

A notable feature of the WLC database, when it was administrated at the CSIR's SAWIC was the meticulous and exact nature of the product in the database. In 1992 Ms Angela Rethman made a point of bringing to the attention of the SAWIC steering committee how much attention was given to the 'correctness' of the process followed in registering and indexing data. Especially after the WLC database was released for marketing overseas, the quality control received substantial attention.³¹⁵ In 1993, Compact Cambridge, the company responsible for the international distribution of the first CD-ROM of the WLC database, was impressed by the high quality of the database and also the consistent quality of all updates of the database.³¹⁶ Locally too, at InfoAccess the WLC had an excellent reputation as a reliable database.³¹⁷ The CSIR made a point of paying attention to securing quality in its service delivery to the WRC in respect of the WLC. In the 1997/98 report of its activities the CSIR indicated

³¹³ . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

³¹⁴ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 13.

³¹⁵ . WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 3.

³¹⁶ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 2.

³¹⁷ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 2.

that it had given detailed attention to editing the entries into the database to ensure that there were no errors. There were ongoing deliberations between the CSIR and the WRC to maintain 'clean technology'.³¹⁸ The CSIR members of the WLC database acknowledged that in the transition of the system from the CSIR to the WRC there had been lapses in the quality but at the same time pointed out that they had improved the editing policy to ensure a better quality control.³¹⁹

Overlap studies on WLC

In the mid-1980s ICT experts focused increasingly on databases and potential overlaps in their information. In 1985, Dr HLM Christie attended a meeting of the pilot committee of SAWIC for the WLC and discussed the findings of comparative research she had done with the Aqualine database.³²⁰ Not all database service providers were eager to work together on comparative studies. However in the comparison test conducted by Christie it was interesting to note that the WLC, despite its short history, tended to have a formidable capacity. The search conducted was "Human disease and potable water". A total of 53 documents overlapped on the two databases. Of these 22,5 per cent were from Aqualine and 13 per cent from Waterlit. In the Waterlit collection 408 documents with a bearing on the topic were extracted, while on AQUALINE, 303 references were extracted. The time span covered by the research was the period from 1975 to 1984. According to Christie's analysis the WLC appeared to be a formidable database – an accolade also supported by the SAWIC pilot committee. Moreover it was evident that the comparison between the two databases showed that there was not a major overlap in terms of the available information.³²¹

In 1988, Ms AG James, head of the WLC, was asked to approach Ms Heather Fuller to write an article on the overlap studies conducted by Rob Collis of the University of London on the WLC.³²² The upshot of this was an overlap study conducted in 1990 to determine to what extent the WLC collection tended to overlap with overseas databases. (This study was aimed at updating the investigation conducted in 1985 by Rob Collis). However, initially the 1990 study met with some problems and subsequently an information scientist who had not previously been involved in the project or in any of the activities of SAWIC, was appointed by the SAWIC to take this

³¹⁸ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 1.

³¹⁹ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 8

³²⁰ . WRC K6/1/0/1 Vol. 1, 5/85. Oorvleueling van WATERLIT met oorsese databasisse and HLM Christie, Report: "Overlap studies", p. 0-1.

³²¹ . WRC K6/1/0/1 Vol. 1, 5/85. Oorvleueling van WATERLIT met oorsese databasisse and HLM Christie, Report: "Overlap studies", pp. 1-10.

³²² . WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 2.

study forward.³²³ In 1990/1 the overlap survey was completed and it indicated that the WLC was significantly advanced. It performed valuable services and made a major contribution to the water sector in South Africa. Moreover, the South African component of the WLC made it unique and the collection provided a unique service that no other database could match.³²⁴

Importantly, however, the steering committee was also informed in a subsequent report on overlap studies of the system that in view of the changing political climate in South Africa it was necessary to start working towards the international acceptance of the WLC and its contents. Specific efforts, it was suggested, had to be made to market the WLC in African countries because of the collection's special emphasis.³²⁵

Innovative searches for new fields to absorb into the WLC

Over the years there was an ongoing search for new fields to explore and literally absorb into the WLC database. In 1984 the pilot committee was informed that the SAWIC had secured collaboration from the Research Institute for Soil and Irrigation and had accessed 240 references from this source for the WLC.³²⁶ In the same year members of the pilot committee were in favour of collaborating more closely with researchers in the agricultural sector. One committee member, Mr E Braune, suggested that more attention be given to the incorporation of agricultural information in the field of hydrology.³²⁷ In 1991 the steering committee advised the WLC team that they should also access information from the Institute for Soil, Climate and Water. It was even hinted that the two databases could possibly be consolidated.³²⁸ In the same year Ms Angela Rethman, manager of the WLC told an annual meeting of the SAWIC steering committee that her team would give more attention to material on irrigation.³²⁹ There also was a growing interest in items of the WLC that had a bearing on environmental legislation. In particular, clients were

³²³ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 13.

³²⁴ . WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 10.

³²⁵ . WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991. Appendix 1. Executive summary Waterlit overlap summary, p. 7.

³²⁶ . WRC K6/1/0/1 Vol. 1, 3/85. Notule van die veertiende vergadering van die loodskomitee van die Suid-Afrikaanse inligtingsentrum vir water, 1984.09.06, WRC, Pretoria, p. 5.

³²⁷ . WRC K6/1/0/1 Vol. 1, 3/85. Notule van die veertiende vergadering van die loodskomitee van die Suid-Afrikaanse inligtingsentrum vir water, 1984.09.06, WRC, Pretoria, p. 6.

³²⁸ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-second meeting of the steering committee of the South African Water Information Centre, Infotek Centre, CSIR, Pretoria, 20 July 1992, p. 1.

³²⁹ . WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 7.

interested in pollution and water quality.³³⁰ From 1993/94, trends in the searches for WLC data dictated that the WLC expanded its database to include more information on the concept of sustainable development.³³¹

The development of a water research register

Ms James reported at a WLC steering committee meeting in 1982 that her team had begun work on developing a hydrological register and that this would take the form of a publication that would be available in the course of 1983.³³² The response to the register, which was to be updated every two years, was good.³³³ Consulting civil engineers were particularly enthusiastic about this system. In 1989 there were rumours that the WRC was giving attention to the development of a national register for all (water-related) research projects in South Africa.³³⁴ There were gentle hints that it formed part of a project started earlier at the CSIR. However, by 1990 the project was no longer on the cards for the mainframe of the CSIR because the WRC had meanwhile started negotiations with the Division of Information Services (national research projects) at the CSIR.³³⁵ In 1990/91, following recommendations by Tina James, Mr AG Reynders of the WRC held talks with Ms Joan Osterloh of the CSIR and Ms Ingrid du Pont about the hydrological register. However there seemed to be considerable uncertainty about the register and its whereabouts. In the discussion it was pointed out that there was a need for the development of a database that covered all water-related research. At the time, Dr Steve Mitchell of the WRC was actively busy with the register. Reynders pointed out that the objective of creating a comprehensive hydrological register was not to focus on research conducted under the auspices of the WRC, but to embrace all water-related research being conducted in South Africa.³³⁶

In 1994 it became apparent that previously the CSIR had begun working under contract to compile a database on water-related research projects in South Africa for

³³⁰ WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 7.

³³¹ WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 13.

³³² WRC K6/1/0/1 Vol. 1, SAIW 3/83 Notule, twaalfde vergadering van die loodskomitee van die SAIW, 1982.10.21, WNK, Pretoria, p. 5.

³³³ WRC K6/1/0/1 Vol. 1, SAIW 6/83 Vorderingverslag Waterlit (1982), p. 3.

³³⁴ WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 7.

³³⁵ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 12.

³³⁶ WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, pp. 2-3.

the WRC.³³⁷ At a meeting of the SAWIC steering committee it was announced that the details of these projects would be made public internationally to make researchers in other parts of the world aware of what had been done in South Africa.³³⁸ This database became freely available and by the end of March 1994 a total of 319 projects were listed in the database. Details of these research initiatives were updated annually when the Water Research Commission funded new projects. The steering committee was also informed that plans were under way to have the information made available on the database of the WRC.³³⁹

WLC and specialised bibliographies

One area that appears to have been ignored for a considerable period of time was that of making select bibliographies available to researchers. In the 1990s, almost as an aside, it was mentioned that the WLC database was used for making a contribution to a special bibliography on waste management.³⁴⁰ Earlier, in 1989 the WLC had also been used to compile a bibliography on limnology in Africa south of the Sahara. The South African Institute of Aquatic Scientists (SASAS) subsequently decided to halt the project because of the high costs involved.³⁴¹ However, this did not deter the WLC team in its search for new avenues of bibliographic research. In 1990 they negotiated with the South African National Committee on Large Dams (SANCOLD) to start working on the development of a bibliography.³⁴² In 1992 the steering committee advised the WLC team that they had to communicate with Mr Neil McCleod, chairperson of the Water and Sanitation 2000 Committee. A desktop study on the theme was under way in Cape Town by Ian Palmer and the chances were that this committee would be interested in the development of a specialised bibliography.³⁴³

By 1994, in view of the direction that had been identified by the SAWIC steering committee in 1993 at a workshop, a new series of specialised bibliographies was started. They dealt, inter alia, with sanitation for developing communities; water supply for developing communities; and another on the privatisation of the water

³³⁷ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 14.

³³⁸ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 14.

³³⁹ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 14.

³⁴⁰ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 12.

³⁴¹ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 12.

³⁴² . WRC K6/1/0/1 Vol. 1. Document 5/1990 Work programme for 1990/1991, p. 1.

³⁴³ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-second meeting of the steering committee of the South African Water Information Centre, Infotek Centre, CSIR, Pretoria, 20 July 1992, p. 4.

industry.³⁴⁴ By 1995, SAWIC had moved into new software for bibliographic databases. They now worked on Windows software, along with a Bibliolinks package that was admirably suitable for creating good bibliographies.³⁴⁵

Because of the announcement of impending changes to the country's water law, the SAWIC bibliographic investigation of 1994/95 into the water law of South Africa was put on hold.³⁴⁶ Meanwhile, at the request of the WRC, the WLC started work on a bibliography of wetlands in conjunction with the Institute for Natural Resources.³⁴⁷

The demand for abstracts

In the early 1990s the issue of including abstracts in the WLC database was a point of discussion amongst the information specialists at the CSIR. But this was met with opposition and there were strong voices raised that such information be confined primarily to appropriate keywords.³⁴⁸ In a steering committee meeting in 1993 there was again criticism of the suggestion that the WLC team write abstracts of articles.³⁴⁹ In 1994 the management of the WLC database admitted that there had been a number of inquiries by users wanting to know if it were possible to be provided with abstracts of articles in the WLC database. However, the issue was held over because in many cases the publishers had to be requested for permission to publish the abstracts. In 1995 the WLC-database team made it known that the idea of adding the abstracts to articles was not a viable one. The exercise was envisioned as being too expensive because estimates suggested that it could cost as much as R250 000 per annum. It also meant that new, as well as existing indexers would have to be trained to enter the data into the system. There were also serious copyright issues that could not be resolved easily.³⁵⁰

The WLC team had meanwhile entered into negotiations with Elsevier's science publishing division to look into the feasibility of purchasing pre-publication records from the publisher. These comprised bibliographic details and abstracts of materials.

³⁴⁴ . WRC K6/1/0/1 Vol. 1, Document 4/94, Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 15.

³⁴⁵ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 5.

³⁴⁶ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 5.

³⁴⁷ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 5.

³⁴⁸ . WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 4.

³⁴⁹ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-third meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 24 June 1993, p. 4.

³⁵⁰ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 3.

However there were no keywords attached.³⁵¹ One of the members of the WLC team had started similar negotiations with Springer Verlag.³⁵²

In 1996, when the ELC was still under the supervision of SAWIC the researchers gave attention to the potential of inserting abstracts on the WLC database.³⁵³

Literature searches

In 1985 Dr WHJ Hatting of the WRC conducted a literature search for the terms “Human disease and potable water” on Waterlit, Aqualine and Medline. He came to the conclusion that much of the material yielded on the searches proved to be irrelevant. Therefore, he was in favour of potentially locating ‘extracts’ from the texts of material that could service as potentially more effective guideline for locating relevant information.³⁵⁴ The search services for data in 1991-2 declined as a result of the introduction of specified charges for the service.³⁵⁵ Ms Angela Rethman, manager of the WLC at the time, also reported that there were distinct changes in the demand for specific types of material in the WLC-database. It was evident that at the universities there was a greater demand for applied research. Consequently there was a distinct reduction in the demand for theoretical material.³⁵⁶ By 1993 the decline continued and it was apparent that users of the WLC were either using their CD-ROMs for searches, or they had access to the internet and consequently conducted their own searches.³⁵⁷

WLC and specialised services to researchers

In 1991 the WLC team started a scanning technology project for a client in the division of water technology at the CSIR. Apart from having to scan in articles, the team also had to scan relevant ‘grey’ material. In terms of the agreement with the client, the WLC team undertook to conduct the services for the duration of a year. The tasks involved in the project included:

- customised scanning;

³⁵¹ WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 3.

³⁵² WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 4.

³⁵³ WRC K6/1/0/1 Vol. 2. Minutes of the twenty sixth steering committee meeting for the South African Water Information Centre (SAWIC), held on 12 July 1996 at the WRC at 10:00, p. 2.

³⁵⁴ WRC K6/1/0/1 Vol. 1, 5/85. WHJ Hattingh (WRC) “Literatuursoektog”, pp.1-2.

³⁵⁵ WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 7.

³⁵⁶ WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 6.

³⁵⁷ WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 7.

- developing a customised database;
- conducting literature searches;
- using an alerting service; and
- making it possible for the client to link up directly with the WLC once the service became available.³⁵⁸

WLC and information mining for research

In 1990 the SAWIC staff was involved in an information database for a research project team that was dealing with waste management and pollution control in southern Africa. The department of environmental affairs and researchers at the CSIR collaborated on the project.³⁵⁹

WLC collaboration with other institutions

i) *JLB Smith Institute for Ichthyology*: In 1985 Ms Margaret Crampton, librarian at the Institute for Ichthyology at Grahamstown visited SAWIC to undergo training in indexing with a view to developing a database similar to the WLC. She indicated that the institute was interested in broadening the project by also incorporating fish into the WLC database. Amongst other things, such a step implied the inclusion of taxonomy, anatomy and marine data, as well as letters, photographs and other information.³⁶⁰ At the time Grahamstown had already linked up with the CSIR system. The collaboration implied that ICHTHY would start up its own database called FISHLIT and that this would be linked up with SAWIC. The FISHLIT information was taken up into the WLC. There was also an incorporation of all the journals the institute used.³⁶¹

As the increasing international isolation of the WLC gained momentum because of the South African politics of the day, the FISHLIT collection seemed to be maintaining strong ties with the Foundation for Research Development (FRD) for funding and was able to participate in overseas communication with researchers working in the areas of aquatic sciences and fisheries.³⁶²

³⁵⁸ WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 9.

³⁵⁹ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 14.

³⁶⁰ WRC K6/1/0/1 Vol. 1, SAIW 4/85. Samewerking met die instituut vir Viskunde, Grahamstad, p. 1.

³⁶¹ WRC K6/1/0/1 Vol. 1, SAIW 4/85. Samewerking met die instituut vir Viskunde, Grahamstad, p. 1.

³⁶² WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 2.

In 1988 it was agreed by the steering committee that the transfer of FISHLIT information and collaboration with the JLB Smith Institute for Ichthyology at Grahamstown would be continued until March 1990. The matter would then come under review.³⁶³ One outcome of the 'second restructuring of the CSIR' was that the WLC and the FISHLIT collection were split and placed under separate projects. However, in 1989 the reporting on the WLC statistics to the FISHLIT collection was still included because of an overlap in the field of aquaculture.³⁶⁴ In 1990/91 all the FISHLIT information that was on the database was transferred to the JLB Institute at Rhodes.³⁶⁵

In 1997 members of the WLC team made a concerted effort to secure more journal titles from Rhodes University's JLB Smith Library. They experienced problems because the university's computer support group were unable to provide all the data required. Consequently information was collected later and then from a list of 62 titles it was possible to select 19 journal titles that were added to the original list of 7 titles that already formed part of the WLC.³⁶⁶

ii) *The National Research Institute for Oceanology (NRIO)*: By 1988 the steering committee of the SAWIC agreed that talks would be held with DEMAT (previously the National Oceanographic Institute for Oceanology or NRIO) to develop a database that would be of value to researchers working in the field of oceanography.³⁶⁷ The institute was at the University of Stellenbosch.

iii) *UP libraries*: Members of the WLC team spent a considerable amount of time between 1997 and 1998 on working through the journal collections held at the University of Pretoria's libraries. In 1997, 12 titles from the medical library of the university were added to the WLC list. The Merensky (main) library proved a very valuable source and information technologists spent several months working at the library.³⁶⁸

iv) *Sabinet*: The WLC data was listed on the Sabinet server for some time. Sabinet used the Magnet retrieval system. The CSIR supplied the WLC data directly to

³⁶³ WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 3.

³⁶⁴ WRC K6/1/0/1 Vol. 1, Document 7/89. Progress report for the period 1 July 1988 to 30 June 1989, p. 1.

³⁶⁵ WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 9.

³⁶⁶ WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 5.

³⁶⁷ WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 2.

³⁶⁸ WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 5.

Sabinet on a fortnightly basis by 1998.³⁶⁹ By the end of the 1990s the WLC was still accessible to Sabinet users as part of the collection of South African databases. The system was not working very well at the time and there were negotiations aimed at improving the situation.³⁷⁰

Marketing

In the 1980s Ms James, the WLC manager, attended a wide variety of conferences. She would set up a stall at the conference centre and talk to the people. A surprising amount of effort went into a free product she distributed to those who were interested in knowing more about the WLC.³⁷¹ In 1989 she reported to the steering committee of that considerable attention was given to marketing. From research conducted it was clear that most of those who used the WLC database were from the academic sector but there was great potential for expanding these services to the industrial sector.³⁷² In 1989 the management of the WLC at the CSIR's SAWIC began giving attention to active marketing of the WLC. They worked on brochures of the collection, a market survey, and launching marketing interventions at conference events.³⁷³ Other potential partnerships for marketing the WLC included industrial trade fairs, and personalised liaison with specialised librarians.³⁷⁴

Marketing strategies tended to push up the monthly records of profile users.³⁷⁵ A market survey conducted for SAWIC on the WLC in 1990 suggested that marketing should focus on specific individuals in the industrial sector who could make effective use the information.³⁷⁶ It was evident that water-related information was mainly

³⁶⁹ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 7.

³⁷⁰ . WRC K6/1/0/1 Final meeting of the steering committee for the project: Waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 5.

³⁷¹ . TOA 20130703, James, T. Menlo Park, Pretoria.

³⁷² . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 6.

³⁷³ . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 6.

³⁷⁴ . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 6.

³⁷⁵ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 3.

³⁷⁶ . WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 8.

necessary in the environmental management sector.³⁷⁷ Clients the WLC-marketing strategies should target were the managers of projects and those involved in development work in the industrial sector. Consultants were also a valuable group of potential customers. Furthermore managers, specifically those in the fields of production orientation and information, had to be made more aware of the potential of the WLC database.³⁷⁸ In 1991, Mr AG Reynders of the WRC urged researchers to make wider use of the services offered by the CSIR's SAWIC.³⁷⁹ He also agreed to sending out a memorandum and formulating a short questionnaire for research project leaders to determine to what extent they were using of the services provided by the SAWIC.³⁸⁰

In 1992 the WLC team targeted a highly diversified group of potential users of the database. They made presentations to civil engineering students and postgraduate students working in the field of water at the University of the Witwatersrand; the staff of the scientific services of Rand Water; the consulting firm of Steffen, Robertson & Kirsten; and staff members at the Institute of Soil, Climate and Water.³⁸¹ Over and above these marketing initiatives, they also visited the Natal Parks Board in Pietermaritzburg; Umgeni Water; the consulting firm of Jeffares & Green in Pietermaritzburg; the Albany Museum in Grahamstown; Rhodes University's Institute for Water Research; the Leather Industries' Research Institute; and the offices of the city engineers at Cape Town and Port Elizabeth.³⁸²

In 1993 the WLC CD-rom was marketed at three international conferences. And at a South African conference on sanitation for developing urban areas, there was a WLC poster presentation.³⁸³ The next year the focus was on existing customers. All subscribers to the WLC were contacted at least once in 1994 and they were provided with assistance in recent developments in the process of making selections of items and search activities.³⁸⁴ The WLC team attended all the meetings of the Water

³⁷⁷. WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 8.

³⁷⁸. WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 9.

³⁷⁹. WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria., 18 July 1991, p. 2.

³⁸⁰. WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 2.

³⁸¹. WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 10.

³⁸². WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 10.

³⁸³. WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 10.

³⁸⁴. WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 16.

Institute of Southern Africa (WISA), as well as the Sixth South African National Hydrological Symposium held in Pietermaritzburg, and a South African Online Conference held in Pretoria. Once again the WLC-database was introduced to third-year civil engineering students at the University of the Witwatersrand and postgraduate students of the University of Pretoria.³⁸⁵

In 1995, SAWIC held an open day to which it invited more than 50 visitors from a wide range of organisations to be informed on the services offered by the institution. There were talks on the background of the Water Research Commission; the role of the CSIR in SAWIC; the range of activities of SAWIC; and its links on the Worldnet Gateway. Visitors were also invited to freely try out the WLC on the Worldnet Gateway, as well as to view the water research project database and the new database on water information services.³⁸⁶

In 1996, there was significant growth in the use of the WLC under the administration of SAWIC. This was ascribed by Ms M Pretorius as the result of an aggressive marketing campaign that had been undertaken by the SAWIC.³⁸⁷

In 1997/8 there were notable initiatives aimed at marketing the WLC. Brochures on the collection formed part of conference packets in South Africa at the Eighth South African National Hydrology Symposium held in November 1997; a workshop on women's participation and gender consideration in water supply and sanitation services in November 1997; and the 1997 Biennial Conference of the Water Institute of South Africa (WISA).³⁸⁸ Also in 1997/8 period, two articles on the WLC were also published in *SA Irrigation* and the *SA Water Bulletin*.³⁸⁹

The best driver towards a renewed focus on marketing arose when the question of measuring the value of the WLC service came up for discussion at a 1997 meeting of the steering committee for the WLC. Mr A Gerber asked what the criteria were for measuring the success of the WLC.³⁹⁰ A lengthy discussion followed on the matter and there appeared to be consensus that attention had to be given to developing criteria to measure the value of the collection. Once that had been done it would be

³⁸⁵ WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 17.

³⁸⁶ WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 2.

³⁸⁷ WRC K6/1/0/1 Vol. 2. Minutes of the twenty sixth steering committee meeting for the South African Water Information Centre (SAWIC), held on 12 July 1996 at the WRC at 10:00, p. 3.

³⁸⁸ WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on waterlit-related activities for the period 1 July 1997-30 June 1998, p. 4.

³⁸⁹ WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on waterlit-related activities for the period 1 July 1997-30 June 1998, p. 4.

³⁹⁰ WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 4.

possible to determine what budgetary investment should be made for the development of the system in the future.³⁹¹ The meeting then discussed the type of sources of information used in the WLC other than journals. Mrs Pretorius pointed out that a number of free publications were used as a rule. Amongst others, the WLC made use of the Environmental Protection Agency's (EPA's) list of the USA publications. These were distributed freely.³⁹² The CSIR did not have a budget for subscribing to publications for Waterlit.³⁹³ Between July 1989 and June 1990 the WLC database was actively marketed at 14 conferences and symposiums, with a team member participating as a presenter and also distributing pamphlets on the WLC.³⁹⁴ The next year the WLC database was publicised at eight conferences.³⁹⁵

By 1999 the marketing of the WLC had diminished considerably. At the WRC there was no policy or budget for marketing services. This placed severe restraints on the dissemination of information on the WLC.³⁹⁶

Despite the apparent decline in the marketing drive there were opportunities for the WLC to be brought to the attention of relevant groups of potential users. In September 1999 Waterlit brochures were distributed at a biotechnology workshop held at the University of Pretoria. Another opportunity presented itself at a workshop on the implications of the new Water Law in November 1998. At the beginning of the 1999 academic year WRC staffers who were familiar with the WLC visited the University of Pretoria's Department of Water Utilisation, as well as the Chemistry Department of Technikon Northern Gauteng (currently Tshwane University of Technology) to inform students about the collection.³⁹⁷

³⁹¹ . WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 4.

³⁹² . WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 4.

³⁹³ . WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 4.

³⁹⁴ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report: Appendix 2, p. 16.

³⁹⁵ . WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, Appendix 3. Marketing at conferences, p. 1.

³⁹⁶ . WRC K6/1/0/1 Final meeting of the steering committee for the project: Waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 5.

³⁹⁷ . WRC K6/1/0/1 Final meeting of the steering committee for the project: Waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 5.

Internationally the WLC also enjoyed some exposure. At the annual conference of the International Association of Aquatic and Marine Science Libraries and Information Centres, held in Iceland in September 1998, there was a paper on “Water research, electronic publications and databases: the South African way”. The presentation shed some light on the activities and publications of the WRC.³⁹⁸ The following year (1999) the Foundation for Water (FWR) in the United Kingdom invited South Africa to share an exhibition stand at the Third Ministerial Conference on Health and Environment. The WRC submitted a number of posters and some of its reports, as well as copies of the WLC CD-rom. Subsequently, the collection was also transferred to Australia where the WLC was exposed to a number of potential Australian users.³⁹⁹

Marketing the WLC to combat South Africa's isolation

The history of marketing the WLC also has an interesting aside related to attempts by the former government to market some of its research in an effort to try and combat the increasing international isolation the country experienced in the 1980s. If one were to read the marketing and commercial transactions to ‘sell the WLC against the grain’, it becomes apparent that they all formed part of an attempt to secure for South Africa some opportunities in a world that was critical of the racially-inspired laws of the day.

Until 1982, South Africa's WLC administrators had an agreement with the System Development Corporation (SDC) for the international distribution of WLC information.⁴⁰⁰ Meanwhile, local librarians and information specialists increasingly came to the conclusion that there were more relevant services available, such as the ‘Dialog’ service provided by Lockheed, that appeared to be more appropriate than the ‘Orbit’ system used by the SDC.⁴⁰¹ There had been prior talks with SDC because when the service started the WLC income from royalties amounted to about \$170 to \$190 per month. However, by 1982 the WLC only earned a monthly income of between \$67 and \$100. SDC had earlier given the promise that they would ensure higher usage of the information, but nothing had come of these assurances.⁴⁰²

³⁹⁸ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., “Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product”, p. 6.

³⁹⁹ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., “Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product”, p. 6.

⁴⁰⁰ . WRC K6/1/0/1 Vol. 1, SAIW 3/83 Notule, twaalfde vergadering van die loodskomitee van die SAIW, 1982.10.21, WNK, Pretoria, p. 4.

⁴⁰¹ . WRC K6/1/0/1 Vol. 1, SAIW 3/83 Notule, twaalfde vergadering van die loodskomitee van die SAIW, 1982.10.21, WNK, Pretoria, p. 5.

⁴⁰² . WRC K6/1/0/1 Vol. 1, SAIW 4/83 Kontrak vir die verspreiding van Waterlit in die buiteland (1983), p. 1.

Representatives from Dialog had indicated to the South Africans that they would be prepared to distribute more information from the WLC.⁴⁰³ However, exiting from its contract with SDC placed impediments on the WLC managers to make use of other service providers. In the United Kingdom a smaller but efficient database distributor, Pergamon Infoline indicated that it was interested in distributing information from the WLC database.

In a meeting of the WLC pilot committee of 1982 there were members who were also of the opinion that it was important to make the information also available to Europe. According to participants in the discussion, a number of European interests were eager to break the apparent monopoly of the existing Dialog and Orbit systems.⁴⁰⁴ However, by 1983 the major stumbling block to collaboration with other service providers was the fact that there was an existing agreement with SDC that first needed to be nullified before the WLC could be distributed on other networks.⁴⁰⁵

In 1983/84 Dr MJ Pieterse of the WRC visited the United States, Britain, Italy and Germany where he held talks with representatives of SDC in Santa Monica; Dialog in San Francisco; Pergamon Infoline in London; the European Space Agency in Frescati; and INKA in Germany. He came to the conclusion that it no longer made sense to keep up the relationship with SDC for the marketing of the WLC. The European Space Agency and also Pergamon Infoline were eager to place the WLC on their systems.⁴⁰⁶ There was clearly also an eagerness on the part of the South Africans to withdraw their collaboration with SDC completely. They were prepared to provide SDC with some marginal extracts from the items, but members of the committee had their reservations about the idea of disseminating information.⁴⁰⁷

By 1988 the contract with Pergamon Infoline had been terminated at the request of Pergamon.⁴⁰⁸ As an alternative, consideration was given to potentially linking up with Quayestel in France. The United States was no longer considered to be a potential option for collaboration and the minutes tellingly reported:

⁴⁰³ . WRC K6/1/0/1 Vol. 1, SAIW 3/83 Notule, twaalfde vergadering van die loodskomitee van die SAIW, 1982.10.21, WNK, Pretoria, p. 4.

⁴⁰⁴ . WRC K6/1/0/1 Vol. 1, SAIW 3/83 Notule, twaalfde vergadering van die loodskomitee van die SAIW, 1982.10.21, WNK, Pretoria, p. 5.

⁴⁰⁵ . WRC K6/1/0/1 Vol. 1, SAIW 4/83 Kontrak vir die verspreiding van Waterlit in die buiteland (1983), p. 1.

⁴⁰⁶ . WRC K6/1/0/1 Vol. 1, 3/85. Notule van die veertiende vergadering van die loodskomitee van die Suid-Afrikaanse inligtingsentrum vir water, 1984.09.06, WRC, Pretoria, p. 4.

⁴⁰⁷ . WRC K6/1/0/1 Vol. 1, 3/85. Notule van die veertiende vergadering van die loodskomitee van die Suid-Afrikaanse inligtingsentrum vir water, 1984.09.06, WRC, Pretoria, p. 4.

⁴⁰⁸ . WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 2.

A Taiwanese delegation will soon be visiting the Centre for Information Services and could be an ideal testing ground for future cooperative ventures.⁴⁰⁹

In 1988 the committee took note of a statement that had been issued by Mr PE Odendaal, the executive director of the Water Research Commission in which the policy of the WRC was outlined in respect of collaboration with neighbouring states in the field of water. The committee was informed that a 'low profile will be maintained in marketing to the neighbouring states'.⁴¹⁰

Duplication services

The operation of information development and communication in the WLC implied that a great deal of material had to be copied. Printing also had to be done before material could be sent to the researchers.

Photocopies

In the 1980s photocopying services were in high demand. Between June 1981 and July 1982 about 24 000 WLC photocopies were printed for the information services. This represented a 10,5 per cent growth in the use of the service and earned R3 193 for the administration. At the time articles were printed at a minimum price of R1 per article.⁴¹¹ Until the early 1990s some of the WLC users still chose to have their information in a printout format. In 1991 the WLC manager, Angela Rethman warned that users would in the near future have to pay for this service.⁴¹² A market survey conducted for SAWIC in 1990 suggested that users of the service would in the near future have to be prepared to receive the information they required electronically, rather than in the form of photocopies.⁴¹³

Scanning

In 1989/90 the first trial runs took place on scanning information for clients. It was thought that by scanning material it would be possible to add value to the service rendered to clients. The scanning service was also an attempt to determine if the scanning project could be run effectively. Scanning, at that early point in time, appeared to be a potential extension of the services rendered by the WLC team.⁴¹⁴

⁴⁰⁹ WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 2.

⁴¹⁰ WRC K6/1/0/1 Vol. 1, Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, (Pages not numbered).

⁴¹¹ WRC K6/1/0/1 Vol. 1, SAIW 5/82. Vorderingsverslag Julie 1981 – Junie 1982, p. 2.

⁴¹² WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 6.

⁴¹³ WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 8.

⁴¹⁴ WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 13.

However, in 1991 the scanning facilities used by the WLC were still limited and the team had to limit the number of clients they could serve on a continuous basis.⁴¹⁵ In the years to come scanning increasingly replaced photocopies because information was sent to users electronically by means of email.

CD-rom technology

The complete WLC database became available to the public in the early 1990s. This meant that it was no longer only exclusively the domain of the WLC librarians and information specialists to locate sources of information for users. This was a task that the users could now perform at their local libraries, and somewhat later, even from their personal computers. The development of CD-rom technology made this possible.

In 1991 SAWIC entered into a two-year contract with the Cambridge Information Group to market Waterlit internationally. The objective was to put the WLC database on a CD-rom. However, at the time the high cost of the CD-rom was considered a constraint on potential South African buyers.⁴¹⁶ In November 1991 it was announced that Waterlit had been identified by Cambridge Scientific Abstracts as one of the best water databases in the world. There was also the concomitant announcement that the database would be distributed and marketed internationally on a CD-rom.⁴¹⁷ The WLC formed part of a whole suite of CDs that covered a variety of fields with databases on aquatic sciences, fisheries abstracts, Aqualine and selected water resources abstracts.⁴¹⁸

One problem experienced was that the market for the CD-rom was still limited in South Africa because the equipment for reading the material was not yet readily available in the country.⁴¹⁹ At the CSIR the WLC team's computers were only fitted with CD drives in 1994.⁴²⁰ By 1993, at the time of the introduction of internet services in South Africa there were some users of the WLC who still preferred the CD-rom. It was now updated quarterly and libraries using the system only needed to make

⁴¹⁵ WRC K6/1/0/1 Vol. 1, Document 5/91. South African Water Information Centre: work programme for 1991/1992, p. 1

⁴¹⁶ WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 4.

⁴¹⁷ Anon., "Waterlit goes international" in *SA Water Bulletin*, 17(5), 1991.11.02 at <http://ehis.ebscohost.com.nwulib.nwu.ac.za/ehost/detail?sid=6c71fcdf-e7f8-47e2-b334-83ae5f7c8ae3%40sessionmgr113&vid=1&hid=107&bdata=#db=awn&AN=21755> (Accessed 2013.07.06).

⁴¹⁸ WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 2.

⁴¹⁹ WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 23

⁴²⁰ WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 2.

provision for a fixed annual payment for the update, whereas if they had to use the internet, the price would constantly be subject to payment.⁴²¹ In 1993 the CD-rom subscription was R3 200. This equalled about 32 literature searches by the WLC team.⁴²² In effect this meant that frequent users of the WLC probably benefited from securing the CD-rom and then compiling their own bibliographies. If they did not have the material at their local library, it could be ordered from the SAWIC.

By 1993 the government and semi-state institutions (at 41,5%) were the largest users of the literature search services of the WLC database. The private sector (27,7%) came in second and the CSIR (22,4%) was third.⁴²³ By 1994 it was evident that there had been a shift to the internet access of the WLC over the CD-rom. The latter simply proved too expensive.⁴²⁴ It could not compare with the immediacy of the internet.

For Angela Rethman who had just returned from a three-month visit overseas it was evident that the major drawback of the CD-rom system was that it was always behind the times, whereas the online database could constantly be updated.⁴²⁵

In 1994 the WLC database was available on CD-rom from two suppliers in the USA, National Information Services Corporation, Baltimore and SilverPlatter Information Inc., of Norwood. The subscription differed. The NISC subscription was R2 775 per annum and that of SilverPlatter R4 300. The updates were six monthly in the case of NISC and three monthly in the case of SilverPlatter. In terms of content the NISC version seemed to be the better option to make use of because whereas the SilverPlatter version only carried the WLC database, the NISC CD-rom carried, in addition to Waterlit, also Delft Hydro (19770–1987) as well as Canada's Aquaref from 1970 to the present (1994).⁴²⁶

By 1994, 39 subscriptions to the WLC-database had been sold by SilverPlatter, eight of which were subscriptions in South Africa and 16 in other countries.⁴²⁷ In 1995 it was announced that NISC had registered a company in South Africa. The marketing and distribution of the WLC database would forthwith be treated as a South African

⁴²¹ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 1.

⁴²² . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 7.

⁴²³ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 9.

⁴²⁴ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fourth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 19 July 1994, p. 3.

⁴²⁵ . WRC K6/1/0/1 Vol. 1, Document 6/93. Report on overseas visit: AM Rethman January-April 1993, p. 3.

⁴²⁶ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 4.

⁴²⁷ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 3.

product.⁴²⁸ Shortly afterwards, SilverPlatter notified the WLC team that it intended to discontinue sales of the WLC. It had become company policy to halt the sales of all items that did not earn at least a minimum annual income.⁴²⁹

In 1997 it appeared that the sale of WLC CD-roms had increased.⁴³⁰ However, this increase proved to only be a temporary one.

⁴²⁸ WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fifth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 7 August 1995, p. 4.

⁴²⁹ WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July 1997-30 June 1998, p. 3.

⁴³⁰ WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 3.

Table 5 CD-roms sold the period 1994–1998⁴³¹

Period	SilverPlatter	NISC	Total
1994-5	23	28	51
1995-6	27	35	62
1996-7	43	27	70
1997-8	22 (9 months)	28	50

CD-rom technology also created new opportunities for the WLC. In 1998 data from the WLC was used in the compilation by the NISC of the African Health Anthology, a database focusing on information related to health matters in Africa.⁴³² The African Health Anthology later formed part of the South African contribution of materials on display at the Zimbabwe International Book Fair in August and the Frankfurt Book Fair in Germany in October 1998.⁴³³ One disadvantage of the release of CD-rom technology was that it made it more difficult for SDAWIC to draw up a profile of the WLC users.⁴³⁴

Access to the WLC on PCs

In 1991 when the WLC database was transferred to the mainframe retrieval system of the CSIR, the first step was taken towards opening up the use of the collection for users to access on their personal computers.⁴³⁵

Copyright issues

Copyright issues came up for the first time in the SAWIC steering committee of the WLC in 1988. This coincided with the issue of costing for the SAWIC services. Ms James of the WLC discussed the matter and the committee agreed that a copyright symbol would be included in all printouts issued by SAWIC, and by implication, also by the WLC.⁴³⁶ In 1995 Dr B Fouché of the CSIR's information services spoke once

⁴³¹ . Based on WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July1997-30 June 1998, p. 3.

⁴³² . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 6.

⁴³³ . WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on waterlit-related activities for the period 1 July1997-30 June 1998, p. 4.

⁴³⁴ . WRC K6/1/0/1 Vol. 2. Minutes of the twenty sixth steering committee meeting for the South African Water Information Centre (SAWIC), held on 12 July 1996 at the WRC at 10:00, p. 2.

⁴³⁵ . WRC K6/1/0/1 Vol. 1, Document 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 1.

⁴³⁶ . WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 3.

again on the matter of copyright. He had investigated the issue and the steering committee acknowledged that it would rely on him for advice on the legal implications of copyright in the database.⁴³⁷

Costing of WLC services

There was resistance to the commercialisation of the services provided by the WLC from the late 1980s onwards. Originally everything was free, but once internationalisation gained momentum after the years of isolation, and the information technology revolution became apparent, the WLC database and its valuable content was no longer merely a service for the benefit of researchers; it belonged to society at large.⁴³⁸

The computer revolution had a marked effect on the field of library and information science where the jobs of traditional librarians and information scientists were now on the line. This state of affairs was also evident in the field of marketing the WLC to institutions outside the CSIR. The WLC staffers at the SAWIC who worked on marketing the service found that when they communicated with specialist librarians there were some reservations. The librarians often felt threatened. However, once the WLC workers had developed good relationships, the distrust turned into sound partnerships.⁴³⁹ The SAWIC steering committee and the WLC team were sensitive to negative perceptions of the WLC and relied on a marketing survey to rectify matters where the image of the WLC could potentially be negative.⁴⁴⁰

In 1988, for the first time, the steering committee of SAWIC listed their plans for the costing of services rendered. Ms Tina James accordingly submitted a tariff list to the steering committee meeting in 1988. The representative from the department of water affairs asked for a formal letter to this effect and expressed the opinion that the department should not be subjected to payment for services rendered by the SAWIC.⁴⁴¹

There seemed to be better understanding at management level that payment for WLC services would be in operation as soon as possible. The only institutions that

⁴³⁷ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fifth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 7 August 1995, p. 3.

⁴³⁸ . TOA 20130703, James, T. Menlo Park, Pretoria.

⁴³⁹ . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 7.

⁴⁴⁰ . WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 6.

⁴⁴¹ . WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 3.

were entitled to free access to the service were the WRC, the Department of Water Affairs and the universities.⁴⁴²

Ms Tina James informed the WLC's SAWIC steering committee that based on research she had done, there had been a substantial decline in the number of users of the WLC.⁴⁴³ Not all members of the committee were of the opinion that there was resistance to payment for the service. Ms James argued that from her experience and discussions she had conducted with stakeholder groups it was evident that for example at museums the staff felt that they were delivering a free service to the public. They expected similar services from the WLC.⁴⁴⁴ In 1989 there were 1 775 users who requested retrospective searches. By 1990 the total number had dropped to 1 178.⁴⁴⁵ What had also become apparent was that clients of the CSIR were at first put off by the issue of charges for searches on the WLC database. However, once they became aware of the procedures that had to be followed there was a distinct increase in the number of users.⁴⁴⁶

In 1990, research by the WLC team at SAWIC suggested that at least 60 per cent of those who used the WLC belonged to the non-paying category. Whereas there had been a drop in users from 239 to 180 in August 1989, by 1990 the monthly average had once again risen above 200 users.⁴⁴⁷ What also became apparent was that the number of retrospective searches, i.e. those for items dating back a considerable period, dropped significantly once the users had to pay for searches conducted by members of the WLC team.⁴⁴⁸

As the electronic dissemination of the WLC database became more easily accessible, the profiles of the users of the database no longer mattered all that much. Indeed it became evident that the users themselves tended to change their own profiles as they

⁴⁴² . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 5.

⁴⁴³ . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 5.

⁴⁴⁴ . WRC K6/1/0/1 Vol. 1. Document 2/90. Minutes of the nineteenth meeting of the steering committee for the South African Water Information Centre, which was held in the committee room A of the Watko Building, Rietfontein, Pretoria, 12 September 1989, p. 5.

⁴⁴⁵ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 7.

⁴⁴⁶ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 10

⁴⁴⁷ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 3.

⁴⁴⁸ . WRC K6/1/0/1 Vol. 1. Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 7.

deemed fit.⁴⁴⁹ Of particular concern in the 1990s assessment of the user profiles and patterns was the fact that fewer people in the private sector made use of the WLC. For the WLC team this was disconcerting because it was anticipated that in future most of the income for the database would come from this sector.⁴⁵⁰ SJOW, the List of Selected Journals on Water that had been circulating for a number of years was also scheduled for costing and it was suggested to the committee that the subscription to this service would be R100 per annum, providing the costing proposals of SAWIC were accepted.⁴⁵¹ Importantly it was also calculated that the WLC was cost effective. Whereas a WLC alerting service of 45 references per month would typically cost R998 per year, a similar service by Aqualine cost R1 889 per annum.⁴⁵²

By 1992 there were indications that despite the increase in the charge for the service in recent years, there had also been an increase in the total number of users. There was also an increase in the number of private sector users – clearly the result of the WLC team responding to recommendations of the market survey conducted in 1990.⁴⁵³ Furthermore, it was evident that those who used the services of the CSIR, where costing of all items had now been implemented, the number of users had increased. The data provided in Angela Rethman's report to the steering committee of the WLC suggested that the decline in government and academic use was because of the pressure in the public sector to reduce expenses.⁴⁵⁴ By 1993 the subscriptions to the monthly alerting service once again started to drop.⁴⁵⁵ The reasons for this were: the state of the country's economy; users were buying the WLC CD-rom; users who had free access to the service in former times, summarily cancelled their subscriptions when asked to pay; and some of the users had started running their own alerting service on the direct access system of the WLC.⁴⁵⁶

⁴⁴⁹ . WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 2.

⁴⁵⁰ . WRC K6/1/0/1 Vol. 1, Document 4/90. Progress report South African Water Information Centre (SAWIC) 1 July 1989 to 30 June 1990, p. 10.

⁴⁵¹ . WRC K6/1/0/1 Vol. 1, Document 2/89. Minutes of the meeting of steering committee of the South African Water Information Centre, 1988.09.20, CSIR, Pretoria, p. 3.

⁴⁵² . WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 10.

⁴⁵³ . WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 4.

⁴⁵⁴ . WRC K6/1/0/1 Vol. 1, Document 4/92. Progress report: South African Water Information Centre (SAWIC) 1 April 1991-31 March 1992, p. 5.

⁴⁵⁵ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 3.

⁴⁵⁶ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 4.

The issue of costing continued until deep into the 1990s.⁴⁵⁷ The fact that taxpayers' and water users' money ultimately paid for the WLC did not seem to have any effect. For the operators of the WLC database it was all a matter of having to locate funds to pay for the services rendered by skilled librarians and information technology workers. To a large extent the conundrum was the consequence of the emergent communications revolution of the internet.

The WLC, PCs and the internet

The advent of the personal computer in the 1980s brought a significant change in the way information scientists and researchers would in future conduct their work. It also had distinct implications for staffing of libraries and information centres such as the WLC, SAWIC and similar institutions at the CSIR. By 1989 there were clearly a number of changes taking place. The structure of the CSIR was in the process of changing and many of the divisions of the CSIR were subject to alternative arrangements, absorption and even closure. What had happened in what was described as 'the second restructuring' at the CSIR was that the division of information services in the structure of SAWIC was transferred to the natural sciences programme. It formed a major component of the water information project.⁴⁵⁸ The process of change and rationalisation gained even more momentum with the advent of the internet in the final decade of the twentieth century. According to a former CSIR manager, Ms Tina James:

We were aware that the systems would become accessible. I was part of a task team in the early 1990s. That was why the whole division was eventually closed down. We knew we had to change. We ran all kinds of other intelligence information. There were about 400 people working in the division. We started creating information managers in knowledge management. The division was changing rapidly. Commercial internet changed everything. We thought a lot about that.⁴⁵⁹

In a 1991 report to the steering committee of the WLC members were told that the new system was being implemented. Records would in future be printed from a database. The appearance of the material would be much better. SAWIC staff could also access the information directly to make modifications where needed. In future it would be possible for users to access the system from their PCs. It essentially only required of them to be registered as users.⁴⁶⁰

⁴⁵⁷ WRC K6/1/0/1 Vol. 2. Document 2/98. Minutes of the twenty seventh steering committee meeting for the South African Water Information Centre (SAWIC), committee room A, third floor, Watko Building, Rietfontein, 23 July 1997, p. 4.

⁴⁵⁸ WRC K6/1/0/1 Vol. 1, Document 7/89. Progress report for the period 1 July 1988 to 30 June 1989, p. 1.

⁴⁵⁹ TOA 20130703, James, T. Menlo Park, Pretoria.

⁴⁶⁰ WRC K6/1/0/1 Vol. 1, 4/91. Progress report South African Water Information Service (SAWIC) 1 April 1990-31 March 1991, p. 2.

Despite South Africa's relative international isolation in the 1980s as a result of the country's racial policies and the imposition of economic, scientific and cultural sanctions, by the mid-1990 the country was rated among the top countries in its class in terms of the internet and related technologies.⁴⁶¹

Commercial impact of the internet

In 1990 the *Post Office Act* of 1958 governed all telecommunications in South Africa. The state-owned Telkom was in control of the telephonic services and had an infrastructure monopoly.⁴⁶² By 2002 some remarkable developments had taken place. In the course of 2003 the email system, which began as a fringe activity used by a handful of enthusiasts had become, thanks to the internet, an operation with more than 3 million users serviced by some 200 competing internet service providers (ISPs).⁴⁶³ The commercialisation of the internet was characterised by a diversified foment by a large loose society of individual enthusiasts who were prepared to negotiate and participate in a number of areas. They were willing to share data.⁴⁶⁴

By 1992 commercialisation became a major issue with the driving force being Digitech that had been started in June 1990 by Anthony Gerada as a service board for distributing information to customers who bought computers from his small store.⁴⁶⁵ In June 1992 the CSIR launched CompuServe Africa, a system similar to that being used by some of the small operators. It featured a bulletin board for the exchange of information, similar to what small dealers were doing. However, the CSIR service tended to be expensive. It was symptomatic of a tendency in the industry that the technology had to be commercialised, especially in areas where there was money to be made.⁴⁶⁶

In 1993, a small group of private internet operators, working commercially and outside the formal legal control of the Telkom system, tried to start communicating with Telkom on starting up an internet system. However the parastatal was of the opinion that the system proposed by the computer experts was 'too undisciplined'.⁴⁶⁷

⁴⁶¹ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 2.

⁴⁶² C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 6.

⁴⁶³ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, pp. 6-7.

⁴⁶⁴ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 7.

⁴⁶⁵ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 7.

⁴⁶⁶ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 8.

⁴⁶⁷ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 8.

Shortly afterwards the small operators began communicating with the CSIR's CompuServe Africa, but it transpired that the ICT experts who had become businesspeople in their own right, tended to be too deterministic and prescriptive in their demands for partnership with the CSIR. Consequently this initiative was stymied for a second time.⁴⁶⁸

By November 1993 the entrepreneurs were behind the establishment of TICSAs, the country's first fully commercialised internet providing service. They were based in Cape Town and the system was representative of what the original developers of the internet had in mind – a non-profit initiative aimed at creating a community of communications with a number of computer companies and service providers collaborating on the project.⁴⁶⁹ Subsequently, in-fighting in the private sector saw TICSAs collapse and a number of small operators claimed a bigger role for themselves. At the same time, Telkom started preparing itself for becoming an ISP provider in its own right. To some extent this development enabled the telecommunications operator to reclaim for itself a part of the business that had been generated by a number of companies based on its available communications links.⁴⁷⁰

SAWIC and the internet

In 1993, reporting on a three-month visit to various countries, Ms A Rethman noted that the most significant trend she had noted while overseas was that information transmission through an intermediary was 'out'. In future the emphasis would be on direct access to all information.⁴⁷¹ The catch phrase at one of the conferences she attended was 'Information at any time at any place'.⁴⁷² The trend was that users were, as a rule becoming more computer literate and would prefer to access all the information they needed on their own computers.⁴⁷³ The latest trends she witnessed overseas were that:

- the internet would become the most important vehicle of information;
- there were significant developments in the field of methods for sharing information resources;

⁴⁶⁸ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 8.

⁴⁶⁹ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, p. 8.

⁴⁷⁰ C Lewis, "Negotiating the net: the internet in South Africa (1990-2003)" in *Information Technologies and International Development*, 2(3), Spring 2005, pp. 9-10.

⁴⁷¹ WRC K6/1/0/1 Vol. 1, Document 6/93. Report on overseas visit: AM Rethman January-April 1993, p. 1.

⁴⁷² WRC K6/1/0/1 Vol. 1, Document 6/93. Report on overseas visit: AM Rethman January-April 1993, p. 3.

⁴⁷³ WRC K6/1/0/1 Vol. 1, Document 6/93. Report on overseas visit: AM Rethman January-April 1993, p. 3.

- there were major moves in the direction of developing powerful and very user-friendly interfaces and gateways;
- fibre-optic technology was on the rise;
- there was a lot of information on patents; and
- simplified public access to information was in the offing with card systems being introduced to pay and secure access to information.⁴⁷⁴

In 1994 the staff at SAWIC, along with the CSIR's information services were constantly working on the internet to determine how and where the databases of the institution would be best placed. At the time there were more than 4 000 groups available on the internet and there was a comprehensive spread of databases related to the environment and water.⁴⁷⁵ By this time SAWIC also had its first internet home page.⁴⁷⁶ By 1995 all the SAWIC staff was familiar with the internet and it had become an integral part of their daily activities.⁴⁷⁷ The internet had opened up a new world for them. They were now able to communicate with groups that they only knew from extensive correspondence. Communication with institutions such as the Environmental Protection Agency (EPA) in the United States; USAID; and the Great Lakes Network; now became institutions with which they had frequent communication. It was also much easier gaining access to reports and researchers and learning about their activities, not only overseas, but also in South Africa.⁴⁷⁸ A major problem that presented itself was the speed of the internet. Many of the SAWIC staffers spent the early part of the day working on the internet before the system slowed down later in the day as a result of the high usage rate.⁴⁷⁹

The WLC and the internet

By 1993 the WLC could be accessed on the internet through the CSIR's InfoAccess that offered direct access to the WLC. The user had to have a computer and a modem. This appears to have been the first web-based system of the WLC.⁴⁸⁰ Both

⁴⁷⁴. WRC K6/1/0/1 Vol. 1, Document 6/93. Report on overseas visit: AM Rethman January-April 1993, p. 3.

⁴⁷⁵. WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 14.

⁴⁷⁶. WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 14.

⁴⁷⁷. WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 1.

⁴⁷⁸. WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 2.

⁴⁷⁹. WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 2.

⁴⁸⁰. WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 1.

novice and expert users could make use of the service. Comprehensive manuals were available to users and the payment for the service was on a monthly basis.⁴⁸¹ The second internet link to the WLC was to be found on the Worldnet Gateway where there was an automatic link to the WLC.⁴⁸² The service went online in May 1993.⁴⁸³ A vast number of databases could be located on this website.⁴⁸⁴ At the time there were only 13 online users of the WLC. Dr Mark Dent of the University of Natal deplored the fact that the number was so low.⁴⁸⁵ At the time there were 22 institutions making use of the WLC.⁴⁸⁶ Among the reasons why the open system was not yet used extensively were:

- many users were still uncertain about the way they had to execute searches on the system;
- resistance to the pricing policy;
- difficulties in budgeting for usage;
- problems with modems and lines of communication;
- increasing use of the Waterlit CD-rom.⁴⁸⁷

For users not frequently using the WLC database, it seemed in 1994 to be more cost effective than making use of the Worldnet Gateway.⁴⁸⁸ Worldwide Gateway was started at the CSIR. It was the precursor of the internet in South Africa. In about 1996 the Worldnet Gateway was sold off for very little to what would later become Mweb.⁴⁸⁹

In 1995 SAWIC staffers were making extensive use of email correspondence with subscribers to inform them of the latest alerts for their respective fields of interest.

⁴⁸¹ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, pp. 1-10.

⁴⁸² . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-third meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 24 June 1993, p. 1.

⁴⁸³ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 1.

⁴⁸⁴ . WRC K6/1/0/1 Vol. 1, Document 4/93. Progress report: South African Water information Centre (SAWIC) 1 April 1992 – 31 March 1993, p. 1.

⁴⁸⁵ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-third meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 24 June 1993, p. 4.

⁴⁸⁶ . WRC K6/1/0/1 Vol. 1, Minutes of the twenty-fourth meeting of the steering committee of the South African Water Information Centre, Watko Building, WRC, Pretoria, 19 July 1994, p. 2.

⁴⁸⁷ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 3.

⁴⁸⁸ . WRC K6/1/0/1 Vol. 1, Document 4/94. Progress report: South African Water Information Centre (SAWIC), 1 April 1993-31 March 1994, p. 3.

⁴⁸⁹ . TOA 20130703, James, T. Menlo Park, Pretoria.

The system seemed to be operating well in that it could also operate automatically, especially after the WLC had been placed on the UNIX system.⁴⁹⁰ By the end of 1996 there were a number of changes in the operation of the WLC. The functions of SAWIC were divided between the CSIR and the WRC. The production of the WLC database remained the responsibility of the CSIR while the other functions of the collection moved over to the WRC. Staff of the former SAWIC who were not at the WRC were absorbed to develop the WRC website.⁴⁹¹

By 1997 the WLC collection had become an ideal laboratory for working on the problem of how to integrate a library database with the latest developments on the internet. In November/December 1997 researchers at the CSIR carried out tests on the feasibility of accessing Kluwer electronic journals on the internet. At the time the experiment still appeared to be fairly expensive and time consuming. The CSIR in collaboration with the IT specialists of the WLC had created a 'state-of-the-art web interface' by 1998 which made it possible for the WLC's data to be viewed in all parts of the world.⁴⁹² The interface had been developed using Cuadra Star/Web software.⁴⁹³ The problems the researchers experienced were:

- most electronic journals were not freely accessible;
- it was time-consuming to search and monitor the internet;
- it took many hours to access internet sites;
- not all the data accessed could be downloaded (the ideal was for each indexer to have access to two computers);
- the information had to be accessed by people who were familiar with the workings of the internet;
- specific items selected for entering into the WLC database had to be indexed by experts in the field.⁴⁹⁴

At the time of the first experiments being conducted there were a number of additional problems that had to be addressed:

⁴⁹⁰ . WRC K6/1/0/1 Vol. 1, Document 4/95, Progress report: South African Water Information Centre 1 April 1994- 31 March 1995, p. 5.

⁴⁹¹ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 4.

⁴⁹² . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 6.

⁴⁹³ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 6.

⁴⁹⁴ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 8.

- Websites identified for monitoring were not always accessible.
- It was difficult to determine the status of the material on the internet. Researchers were uncertain on whether information consulted on one day would again be available the following day.
- There was uncertainty about how long free websites with journals would remain freely accessible.⁴⁹⁵

The death knell for the hard copy material provided by the WLC was a research report completed in 1997 at the University of Pretoria. In a MA dissertation F Myburgh sounded a dismal future for Waterlit. As a result of electronic journals, newsletters and manuscript archives the future of collections like Waterlit seemed dark. From an information science perspective the projection was that although a database such as Waterlit could still hold out, there would be an increased tendency towards electronic information⁴⁹⁶

It appeared that the WLC team at the WRC was ready for the imminent changes because the WLC website was officially launched in January 1998 and upgraded in April 1998. Soon, a list of journals was also added to the website. The feedback from users was favourable with some comments coming from as far away as Sweden.⁴⁹⁷ As of 1 April 1998 all web users of the WLC had to register with foreign users obliged to pay a subscription fee. The web developers also made provision for users to have the opportunity to work on a trial basis on preliminary WLC data before they made a decision on whether to subscribe.⁴⁹⁸ One major advantage of the internet for WLC operations was the rapidity of updating although there were still difficulties in the process of indexing data from the internet. In some cases the costs were high and there were indications that referencing internet data could pose significant obstacles.⁴⁹⁹ As internet technology increasingly became available, the CSIR's information technologists started applying new methods of quick processing. By 1998, records were placed on the internet twice a month.⁵⁰⁰ The WLC team were also forward-looking. Plans were already put in place in 1998 to ensure that no problems

⁴⁹⁵ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 8.

⁴⁹⁶ . F Myburgh, An overview of trends in bibliographic database production with specific referenced to the Waterlit database (MA, University of Pretoria 1997).

⁴⁹⁷ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 6.

⁴⁹⁸ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 6.

⁴⁹⁹ . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

⁵⁰⁰ . WRC K6/1/0/1 Vol. 2. Document 3/98. CSIR progress report to the steering committee Waterlit database production and development, July 1997 to June 1998, p. 1.

arose with the timing devices of the computer systems in the transition to the new millennium in 2000.⁵⁰¹

In an effort to determine what the potential needs of water researchers might be for the WLC, in 1998 Ms Pretorius started an internet discussion group that gave participants the opportunity to discuss matters of how to make the WLC more accessible and express their views on specific needs they might have.⁵⁰² The idea of a discussion group arose because of the many queries the WLC team received from users about securing access to the database.⁵⁰³ In 1998 there were 250 South African subscribers to the service while there were no overseas users.⁵⁰⁴

The WLC website officially went online for the first time on 1 April 1998.⁵⁰⁵ The internet also opened up the WLC to the outside world. In 1998 it was possible to access the WLC on the WRC's website. Access to the WLC was free of charge for the first three months.⁵⁰⁶ A year later 755 South Africans were registered on the WLC's free service while overseas users were required to subscribe to the database.⁵⁰⁷ South Africans could use the service free of charge. Overseas subscribers had to pay US\$500.⁵⁰⁸

It was evident that linking the WLC to the internet had started bearing fruit. Mr S Abbott of the CSIR told the steering committee of the WLC that there had been a marked increase in the use of the collection, largely as a result of its availability

⁵⁰¹ . WRC K6/1/0/1 Vol. 2. Document 4/98. CSIR work programme submitted to the steering committee for Waterlit database: production and development: July 1998- June 1999, p. 2.

⁵⁰² . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 2.

⁵⁰³ . WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on waterlit-related activities for the period 1 July 1997-30 June 1998, p. 2.

⁵⁰⁴ . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

⁵⁰⁵ . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

⁵⁰⁶ . WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July 1997-30 June 1998, p. 1.

⁵⁰⁷ . WRC K6/1/0/1 Final meeting of the steering committee for the project: waterlit database development, WRC offices, Watko Building, Rietfontein, 1999.06.17. Document 5/99. Anon., "Water Research Commission: Waterlit – past, present and future. Overview of a unique South African product", p. 4.

⁵⁰⁸ . WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

on the internet.⁵⁰⁹ The alerting service provided by the WLC underwent a notable decline once the database became available on the internet. Because they had to pay for the alerting service, in the early 1990s some institutions chose to either cancel their subscriptions or decided to combine different branch libraries to one subscription.⁵¹⁰ In effect this meant specifically that requests from WLC database users for searches declined. In the longer term this became a notable feature.

Table 6 Once the WLC database was available on the internet in 1998 the number of searches declined in a marked manner⁵¹¹

Year	Number of searches
1991	401
1992	240
1993	191
1994	116
1995	78
1996	140
1997	88
1998 (first six months)	40

Subscriptions to the monthly alerting service dropped significantly in the period 1993-1998.

Table 7 The decline in subscribers requiring monthly alerts declined significantly in the period 1993 to 1998⁵¹²

Year	Number of subscribers
1993	179

⁵⁰⁹ WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

⁵¹⁰ WRC K6/1/0/1 Vol. 1. Minutes of the twenty-first meeting of the steering committee for the South African Water Information Centre, Watko Building, Pretoria, 18 July 1991, p. 6.

⁵¹¹ WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July 1997-30 June 1998, p. 2.

⁵¹² WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on Waterlit-related activities for the period 1 July 1997-30 June 1998, p. 3.

1994	143
1995	108
1996	88
1997	86
1998	79

The WLC team reported to the steering committee in 1998 that they intended doing away with the alerting service and replacing it with an internet-based system.⁵¹³ By 1998 the department of water affairs was shifting increasingly in the direction of hiring consulting engineers to do contract work for them. Consequently the use of the WLC in the department began to decline.⁵¹⁴

⁵¹³. WRC K6/1/0/1 Vol. 2. Document 5/98. Water Research Commission (WRC): report on waterlit-related activities for the period 1 July 1997-30 June 1998, p. 3.

⁵¹⁴. WRC K6/1/0/1 Minutes of the Inaugural meeting of the steering committee for the development of the Waterlit database, held at the Water Research Commission, Pretoria, on 22 July 1998, p. 4.

Conclusion and some observations on the WLC and its use at SAWHAR

Evaluating the WLC in hard copy and comparing it with the electronic database in the new millennium is much the same as making an appraisal of a scarce vintage car and a sleek luxury car. Aesthetically the vintage car appeals to one's finer feelings and below the veneer of appearance there is still a sense of power that captures the imagination of someone who takes some time out to appreciate a useful piece of technology dating back to an earlier, less frenetic time.

The WLC in 2013 lives on electronically in the EBSCO database. Most of the items in the WLC catalogues deep into the 1990s can be found on the internet, accurately recorded and saved for posterity in cyberspace. At the same time there is the hard copy collection that now fills in excess of 200 metres of shelf space in a special archival repository of North-West University's new library building in Vanderbijlpark. For historians, but also for those intrigued by research in science and humanities, the physical collection may well be of substantial value. By physically, using the WLC's comprehensive thesaurus as a compass, the individual researcher of the 21st century is bound to discover some vitally important research material.

The WLC in hard copy is by no means a perfect collection. There are a number of gaps in its chronology since the 1970s. Also, it is not always very user friendly. The fact that it was based on keywords assumes that those who search for data know the relevant keywords. The thesaurus, in the view of many, is a crucial part of the collection and the prospective researcher working in the collection knows precisely how to go about initiating an inquiry and finding relevant material.⁵¹⁵

As a vintage item the hard copy WLC material can metaphorically be termed the 'analogue' collection. There are certain difficult-to-define qualities inherent in the dusty documents on the shelves that will never be part of the 'digital' WLC catalogue. They serve different purposes but are also intricately and permanently linked.

Observed as a birds-eye view over the long term the Waterlit Collection made available valuable information to researchers at a crucial time in the development of South Africa's water sector. It therefore has substantial historical value.

The collection also made it possible to provide information to users over a broad spectrum of disciplines from the natural to the human sciences.⁵¹⁶ For researchers, being able to secure access to the Waterlit Collection database meant that it saved them many hours of hard slogging in libraries, working through manual catalogues and literally having to page through journals for articles.⁵¹⁷

⁵¹⁵. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

⁵¹⁶. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

⁵¹⁷. TOA 20130709, Aucamp, PJ, Pretoria (Audionote file).

An informal scrutiny of the material in the current archival collection suggests that there is a vast wealth of information – some of it very eccentric and innovative. Articles taken from popular magazines stand side-by-side on the shelves with articles from some of the most prestigious science journals. There are comprehensive reports – unpublished and published – and conference papers, annual reports ... and much of the material is international in content. However, ultimately it is the South African material that will in future potentially gain in value. These items tell the story of South Africa's scientific venture into the complex field of water studies at a time when in response to the requirements of government and the country's economic developmental needs, water became a fundamental focus; it made a contribution towards optimising the social, ecological, economic and cultural performance of the country and its people in the context of the hydrosphere.

In 2014 there are still many gaps in the collection; these have become apparent because the collection represents a view from a different era, when the spirit and ambitions of a multiracial democratic society on the rapidly developing African continent was taking stock of its past, present and future in respect of the vitally important hydrosphere of southern Africa.

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