DEPARTMENT OF WATER AFFAIRS & FORESTRY

Directorate: Resource Quality Services

ADOPT-A- RIVER PROGRAMME PHASE 2

DEVELOPMENT OF AN IMPLEMENTATION PLAN

Project number: WP 9583

INCEPTION REPORT

APRIL 2008

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REPORT DETAILS PAGE

Project name:	***Adopt-a-River Programme Phase 2***
	Development of an Implementation Plan
Report Title:	*Inception Report*
Authors:	***L Rossouw, A Neumann, P de Souza, Y Burger and JN Rossouw***
Status of report:	***Draft***
First issue:	***February 2008***
Final issue:	

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EXECUTIVE SUMMARY

To be completed after the Inaugural Steering Committee Meeting

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1. INTRODUCTION

This Inception Report is based on the project proposal, which had been refined, where required, to provide a clear and concise description of how the project will be undertaken by the PSP, what deliverables will be produced, and in which sequence. It provides detailed financial information and a summary study programme. This is therefore the document that aims to clarify outstanding aspects and uncertainties, address new issues or tasks identified during the Inception Phase, and list the anticipated deliverables.

The Inception Report will also form part of the "Record of Decisions" that will be kept up to date to ensure that all relevant discussions and decisions taken throughout the project are properly documented.

1.1 BACKGROUND

An initiative to create awareness amongst all South Africans of the need to care for our scarce water resources and to facilitate their participation in the protection and management of these resources was raised in Parliament in 2006. Parliament wanted to know from officials of the Department of Water Affairs and Forestry (DWAF) whether South Africa's rivers are healthy and fit for use. Some Members of Parliament volunteered to adopt a river and to act as a patron for that river. This was done to foster public participation in the protection and management of our rivers and also as a sign of their own commitment.

To give effect to this initiative the Minister requested DWAF officials to formalise and implement such a programme as soon as was practicably possible.

Involving voluntary groups in the protection and management of our resources is not a new concept and in February 2002, our President, Mr Thabo Mbeki, called on the people of South Africa to volunteer their services with the following words: "We have it within us as a nation to join them and many others to forge a massive movement of volunteers – dedicated workers in all fields of life – to bring to life those enduring attributes of all our people, of perseverance and persistence in the struggle for our own good and the good of humanity"

Involving volunteer groups in the protection, management and, in particular, monitoring of water resources is used successfully in many countries of the world. Examples are the ALLARM (Alliance for Aquatic Resource Monitoring) Programme, community based water quality monitoring in Alabama and the Philippines and participatory research where citizens and scientists are linked (Rossouw and February, 2006).

There are also examples of volunteer monitoring activities in South Africa such as the catchment fora, Friends of the Liesbeeck River, Friends of the Nylsvlei and many other "Friends of" groups (Rossouw and February, 2006).

The Adopt-a-River programme can play a vital role in encouraging citizens to learn about water resources and become involved in the protection and management of these resources in their particular area.

Once awareness of the water resource and its problems/benefits is created, stakeholders, including volunteers, can gain knowledge and insight into the causes of the problems affecting the quality of the water resources in their area. They will then be able to act as watchdogs, but also be part of the prevention and problem solving fraternity for the specific water resources in their area.

An additional benefit of their awareness and involvement is that the volunteers will be empowered to realistically evaluate service delivery and hold the relevant authority responsible where there is a lack of implementation of important elements of existing environmental and water resource management policies and strategies.

The main aim of the Adopt-a-River programme is to create an understanding among all water users and in particular the previously marginalised communities of the concepts of integrated water resource management, to encourage them to become actively involved in the protection and management of these resources (DWAF, 2007). Specific objectives include:

- Empowering all users of water to protect their water resources and participate in water resources management as captured in Key Focus Area, 9.5 of the DWAF Strategic Plan.
- Facilitating the involvement of patrons and sponsors (influential individuals) in stakeholder empowerment and resource management strategies.
- Developing and making available the necessary tools for training and empowering local implementing agents and other role-players.
- Ensuring optimum effectiveness, through involvement and linkages with other existing programmes and initiatives aimed at water resource protection and management.
- Promoting a volunteerism ethic in South Africa to benefit all levels of society.

A phased approach is being followed to develop the programme. Phase 1 was the initiation and development of a Strategic Framework document (DWAF, 2007). Phase 2 of the project (which is the topic of this assignment) is the development of an Implementation Plan and the preparation for Phase 3 where pilot implementation on selected rivers will take place.

The main aim of this project as given in the TOR is to develop a detailed implementation plan for the Adopt-a-River volunteer monitoring programme. Specific objectives include the following:

- Investigate models for volunteer monitoring programmes used in South Africa and elsewhere in the world and propose a suitable model for the Adopt-a-River Programme.
- Conduct a situation analysis of stakeholder involvement in resource protection management initiatives in SA and propose suitable links between these programmes and the Adopt-a-River programme.
- Develop a detail list of stakeholders.
- Determine the required institutional framework and governance structures.

- Conduct a water resource quality situation analysis based on available information for each of the catchments selected for pilot implementation.
- Design the data acquisition component/s of the monitoring programme/s.
- Develop data management and reporting structures.
- Quantify resource requirements.
- Identify training requirements and develop appropriate training material.
- Record of decisions document summarising all the processes followed and decisions taken during the project.

1.2 APPOINTMENT OF CONSULTANT

Proposals for this study were submitted in October 2007, in response to the Department of Water Affairs and Forestry's request for a proposal in accordance with the DWAF Guidelines and Terms of Reference.

The Department's Directorate: Resource Quality Services, appointed a Consortium led by Linda Rossouw to undertake this study, entitled: " Adopt-a-River Programme Phase 2: Development of an Implementation Plan".

1.3 STUDY TEAM

Linda Rossouw will be the lead consultant. Sub-consultants will include Ninham Shand Consulting Services, Yolande Burger, and Emanti Water and Environmental Engineering Services.

Together they have formed a study team with the following capabilities:

- an in-depth understanding of current institutional developments in the Department related to water quality management.
- a sound understanding of the National Water Policy, Legislation and guidelines for implementation
- experience in developing integrated water resource management strategies and plans
- expertise in the various specialist disciplines needed to address all the requirements of the study.
- an in-depth knowledge of volunteer monitoring.

1.4 CAPACITY BUILDING

Building capacity of historically disadvantaged individuals (HDIs) in the fields of water resource planning and development, and environmental management, is viewed as an integral part of this study. Capacity building entails giving HDIs the requisite practical exposure and background training to be able to participate meaningfully in the study.

Thabisa Manxodidi and Warren Retief, from Emanti Management, are both young chemical engineers in training. Ms Haneem Hendriks from Ninham Shand Consulting Services is a

candidate engineer. All three of them will benefit in terms of gaining experience and being able to work independently on similar projects in future.

2. INCEPTION PHASE

The vision of what the Adopt-a-River project aims to achieve in the short to medium term:

> *"DWAF has the necessary institutional support structures and enabling environment within which stakeholders across a broad spectrum, ranging from government to marginalised communities, can participate meaningfully and indefinitely in the sustainable protection and management of our water resources."*

The current project sets out to design the mechanisms to facilitate creating such an environment. It is assumed that institutional structure and communication infrastructure will be of paramount importance in achieving such an environment, and a main ingredient of sustainability of the Adopt-a-River programme in any river system.

2.1 INCEPTION MEETINGS

A Contract meeting between the Project Coordination and Management Team (PCMT) and Linda Rossouw was held on 11 December 2007. At this meeting, all the tasks were discussed and the project proposal was refined in order for the contract to be finalised for signature by the two contracting parties.

2.2 INCEPTION REPORT

The Inception Report spells out the approach that the PSP Team will follow in assisting DWAF in designing and preparing implementation manuals for implementation of the proposed Adopt-a-River programme.

The following additional workshops were identified by DWAF (additional to the original proposed scope of work) and has been incorporated in the Inception Report although funding for these meetings will be additional to the contract price and it was proposed that a champion be found to fund these workshops.

- At least two additional one-day workshops will be held, one at the beginning of the project and another one close to the end of the project. DWAF and WRC are discussing sponsorship of these workshops and this will be discussed in more detail (i.e. who should attend and what are the objectives) during the first Project Coordination and Management Team meeting on 27 February 2008.

3. ADOPT-A-RIVER PROGRAMME PHASE 2: DEVELOPMENT OF AN IMPLEMENTATION PLAN

3.1 TASK 1: INCEPTION REPORT

3.1.1 Objectives

The objectives of the Inception Report are to consult with key stakeholders in the Department, review the study plan if required, and compile an Inception Report to form the basis of the contract for the study and to define the study plan in sufficient detail to allow effective management of the study. Activities undertaken during this phase will also strive to ensure that institutional interests, responsibilities, and integration of deliverables from various tasks are optimally integrated.

3.1.2 Approach

During project inception, the following activities will be undertaken:

- Review of the project proposal with the client, clarifying any issues or concerns raised by the client.
- Assemble project team, assign responsibilities, and prepare letters of appointment for sub-contractors.
- Compile a detailed project work plan with appropriate target dates.
- Compile a schedule for client and stakeholder meetings and fix those dates.
- Finalise the project team and individual budgets.
- Contractual, administrative and project management arrangements with the Department and sub-contractors will be finalised.
- Finalise the project deliverables, formats, quality controls, reviews, etc.

Compile an Inception Report that sets out the detailed tasks, activities and schedules of the project.

3.1.3 Deliverables

This Inception report detailing the tasks, activities and schedules of the project is the first deliverable.

Target Date: 29 February 2008

3.2 TASK 2: LITERATURE SURVEY AND DEVELOPMENT OF AN IMPLEMENTATION MODEL

3.2.1 Objectives

The objectives of the second task is firstly to consolidate our understanding of the monitoring programmes in South Africa, including volunteer monitoring, and elsewhere in the world by

conducting a literature survey, and including current stakeholder involvement initiatives. Secondly, a detailed stakeholder list will be developed, and possible future links between other initiatives and the Adopt-a-River programme will be identified.

3.2.2 Approach

There is quite a comprehensive body of published reports and information available on volunteer monitoring, especially in the USA and Australia. There are also a number of examples for volunteer monitoring initiatives at national and local level that can provide insights that may be of value in determining an appropriate volunteer water quality monitoring model for South African conditions. Currently for example, there is an Adopt-a-River programme in the Western Cape involving the Eerste River. It is assumed that there will be many more examples of this but some may only identified as the pilot studies begin and more public awareness is created.

Rossouw & February (2006) provided a broad overview of volunteer monitoring and how different countries have approached this. The focus of this literature review will be to identify a short list of appropriate models for the Adopt-a-River programme, including the pros and cons of the different models. A starting point will be the reference list as sited in the report as well as an Additional Google search for new references. These models will then be discussed with the client and our team members to select the most appropriate model or models.

Ms Burger and Ms Neumann will play a key role in the identification of the key stakeholders. An initial list of stakeholders is available from Rossouw & February (2006) and referral techniques will be used to identify additional stakeholders who are potentially involved in Adopt-a-River type of activities. Ms Burger will focus on the institutional stakeholders and Ms Neumann will focus on community based stakeholders. The final list of stakeholders that will be consulted would be compiled in consultation with DWAF. More detail on methodology is presented in Task 3.

The objectives of these consultations with stakeholders would include the identification of other existing monitoring initiatives, including that of volunteers. Some volunteer initiatives may not be water related but the model being used may be appropriate for South African conditions.

3.2.3 Deliverables

- A volunteer water resource quality monitoring model or models appropriate for the Adopt-a-River programme under South African conditions.

  Target Date: 30 April 2008

- Database of stakeholders.

  Target Date: 31 May 2008

3.3 TASK 3A: DEVELOP AN INSTITUTIONAL FRAMEWORK AND GOVERNANCE STRUCTURE

3.3.1 Objectives

To conduct interviews/workshops with stakeholders and to develop an institutional framework and governance structure that would be agreeable to the various roleplayers. This task must be done in close cooperation with the DWAF Team.

3.3.2 Approach

Based on the literature survey in Task 2, the team would be aware of potential pitfalls or limitations that may exist when implementing under certain specific conditions, any of the different models pertaining to information collection on a volunteer basis. It will be necessary to test the validity of the theoretical models and models that work well elsewhere, both in the perception of the stakeholders, and also in the context of their constraints and expectations.

To this end, interviews will be held with major stakeholders in catchments of those rivers already adopted by DWAF regional offices and the DG:DWAF.

The current premise is that the Adopt-a-River programme has to function at all levels in society: ie. local community, commercial entity, local authority, river catchment, provincial government and national level roleplayers have to be engaged to the extent of their respective interest in the river's health and sustainability.

A keystone for success would be to have a visible commitment from the top in any of the abovementioned stakeholder bodies, to become actively involved in protection and management of their resource(s). For the foreseeable future it is assumed that DWAF will be the champion of this initiative to manage 'adoption' of rivers. It is also assumed that existing reporting structures and communication forums ought to be utilised in preference to creating new structures/forums. If these two premises are valid, then it would follow that the 19 Catchment Management Agencies would be the logical bodies to promote the health of rivers in their areas of operation.

General awareness will foster insight into relationships and problems in the water cycle, but on its own would not be sufficient to achieve the objectives of integrated water resource management. Interviews with major stakeholders, at the design stage of the Adopt-a-River programme, and any volunteer component thereof, will serve to ascertain to what extent the necessary commitment already exists and where obstacles may need to be overcome in order to achieve the desired commitment.

Key stakeholders have been identified during Phase I Development of a Strategic Framework for the Adopt-a-River Programme. Any additional stakeholders would probably have been added during the Task 2 literature survey above at the onset of this Phase 2 assignment - Development of

the Implementation Plan for the Adopt-a-River Programme. Additional stakeholders will also be identified during the 8th May 2008 Workshop sponsored by the WRC.

Key stakeholders involved to date comprise the Minister and top Departmental Officials in the Department of Water Affairs & Forestry, both at national and regional levels. Inputs will also be canvassed from their counterparts in sister departments. The Departments of Environmental Affairs & Tourism, Agriculture, Health, Education, Trade & Industry and Minerals & Energy will be invited to make inputs during this phase of the study. The perspective of these departments is important because various interfaces exist between water resources, water infrastructure, water users and potential polluters. The abovementioned departments could fall in any or all of these categories at a given time.

Because of government policy to implement water and sanitation programmes as close to user level as feasible, water supply may fall under jurisdiction of any of a number of implementing agents, be they water boards, local authorities or other service providers. To the extent viable, inputs from representatives of these bodies, as interested and affected parties in the pilot catchments, will also be drawn into the design process under this task.

Where Catchment Management Agencies exist, or are in the process of being established, the team will endeavour to use existing communication channels, as mentioned above. It is in the interest of integrated water resource management principles and sustainability of any new catchment management agency, as well as the Adopt-a-River programme that these roleplayers understand and honour each others' perspectives. Starting off in this manner will lay the foundation for very necessary feedback channels in future.

It is assumed that all inputs can be collated per catchment in a single forum created for the purpose during this study. Informal discussions or correspondence with the stakeholders are foreseen, but not one-on-one meetings with each stakeholder.

The governance structure will be designed with sensitivity to the responsibilities of key stakeholders at national, provincial and local level. Roles and responsibilities allocated as part of the governance structure of the Adopt-a-River programme will as closely as is viable follow the line functions that stakeholders have in their departments. The challenge will be to align the communication channels across different institutions, without duplicating existing channels and creating additional reports and data requirements that fall outside the scope of the line managers who will be responsible for certain components of the Adopt-a-River programme. When managers do not actually need data or information for their own work, sustainability of their involvement and accuracy of their reporting become unlikely.

When managers are motivated by the usefulness of the deliverables/reports of any monitoring system for their own managerial purposes, this would be the greatest predictor of the system's longevity and success.

It is not obvious how the conclusion was reached in the Strategic Framework that volunteerism will be a key component of the piloting stage and therefore of the design under this Phase 2 assignment. Generally speaking volunteer activities display a local interest and focus and sporadic nature, rather than a draw down facility for a whole river. Hence it is necessary to explore the role that professional societies can play, which in the words of the respected political expert Francis Fukuyama[1], are the modern day equivalent of volunteers and people who are motivated and driven by their contribution to the greater good of society. This matter will be tested amongst the primary stakeholders of the Adopt-a-River design team and client team.

Roles to be accommodated in governance structure/ institutional framework	**National level**	**Regional level/CMA**	**Local level/ Mun, WUA**
Coordinate and administer Adopt-a-River programme	x		
Inputs into operational design of Adopt-a-River programme	x	x	x
Mobilise and support Adopt-a-River steering committee	x		
Programme publicity and training material	x		
Provide adequate budget to sustain programme – seed money for volunteer monitoring also to be provided where necessary	x	x	x
Ensure linkages to relevant national programmes	x		
Represented on Steering Committee to provide strategic guidance to Adopt-a-River programme	x	x	x
Implement policies to conserve and manage water resources		x	x
Procure, mobilise, coordinate and support Adopt-a-River expertise/resources		x	x
Identify source of funding for awareness, training, monitoring, river clean-ups and rehabilitation		x	
Consult stakeholders		x	
Maintain communication channels between stakeholders	x	x	
Find patrons for the programme at a senior level		x	
Mobilise and involve roleplayers at local level to implement Adopt-a-River programme			x
Deliver sustainable services to users			x
Identify and coordinate local clean-up or restoration initiatives			x
Support capacity building and knowledge sharing initiatives at local level			x

It is assumed, until parameters can be defined with greater certainty, that the above headings and topics will be in congruence with the client's expectation as to the level of resolution in the deliverable "institutional framework and governance structure." Any greater level of detail may be unattainable in the time and resources available, and may result in a less "purposely tailored for

[1] The End of History and the Last Man

each catchment" framework/structure than the client envisaged. The client will be kept informed of findings on this aspect as the study progresses, so that outcomes and focus do not have an undue element of surprise.

It is proposed that the PSP Team should, before going into any of the regional workshops, present and discuss a straw-dog on the proposed governance structures with the DWAF Team to ensure that there are no conflicting ideas.

During workshops with the stakeholders, the team will determine which components of governance are likely to experience lack of commitment at all or certain levels. Practical problems may also be anticipated, in which case mitigation measures may be appropriate. These consultation meetings or workshops are likely to be very fruitful in focusing and steering the planned assistance effort and avoiding duplication of responsibility or serious gaps in monitoring and reporting.

An inventory will be compiled of the characteristics that form the building blocks of sustainable water resource management in each of the catchments earmarked for piloting of the draft institutional framework/governance structure. Two such meetings in river catchments selected for design stage information collation are included in the budget for the study.

The team will aim at collecting sufficient information from the stakeholders and experts in a geographical area, as well as from site visits, in order to establish the need for and viability of mobilising volunteer and/or commercial resources to assist with monitoring of river water quality and other parameters related to sustainable water supply infrastructure and services from the river in question. Related topics are water purification, pollution prevention and management, water borne diseases and effective reversal of contamination of water sources.

There is the assumption that the team would be able to do all the necessary communication with two workshops in selected catchments – involving all stakeholders simultaneously. Two would be an absolute minimum number of workshops, considering the lack of capacity in many stakeholder institutions, consultants standing in for government officials, lack of continuity in stakeholder representatives in general, and in certain cases low commitment to meeting attendance.

Supplementary discussions with relevant authorities or other bodies, where deemed necessary in some river catchments, will be initiated and arranged with approval of the client. Provision has been made for electronic and telephonic discussions of this nature. However, should such discussions involve additional workshops beyond two per river catchment, these are not included in the scope of work at this stage.

Based on strengths and weaknesses encountered, a draft governance structure will be proposed and discussed with the parties. It is envisaged pilot implementation will in all likelihood take place in a sample of those river catchments which have been adopted to date. It is possible that a single mechanism cannot work across all catchments and rivers, in which case critical issues will be flagged for further attention. Of nine or ten river catchment areas it may be feasible to design a

family of pilot structures for say no more than two or three Adopt-a-River mechanisms as part of the Phase 2 study. Meaningful recommendations can then be made of the requirements for the foreseeable future, and appropriate application of resources for these and adjacent catchments. The team will gradually choose a subset of adopted catchments, representative of the spectrum, where patrons at a senior level show interest in furthering the cause of their river, to actively involve in the design and pilot stages – more than those who are perhaps paying lip service to their patron status. At pilot stage of the implementation plan, we suggest to roll out the abovementioned two or three standard models and at that stage design and test variations on the model which would be appropriate for a river, based on local feedback from stakeholders.

3.3.3 Deliverables

An Institutional framework and governance structure for the Adopt-a-River programme

Target date: 31 July 2008

3.4 TASK 3B: WATER RESOURCE QUALITY SITUATION ASSESSMENT

3.4.1 Objectives

The objective of this activity is to undertake an assessment of the current water resource quality situation in the rivers that have been identified for pilot implementation in order to identify the key water resource quality issues of concern to stakeholders, and to match those to potential Adopt-a-River activities. The output of this activity will be used to inform Phase 3 of the Adopt-a-River Programme, namely “Pilot Implementation in Selected Rivers”.

One of the main aims of these assessments is to use it as information when communicating with stakeholders at workshops in the selected catchments to stimulate interest in the Adopt-a-River project.

3.4.2 Approach

In the Draft Strategic Framework for the Adopt-a-River Programme (DWAF, 2007) a number of catchments have been identified for pilot implementation of the Adopt-a-River Programme. A brief water resource quality situation analysis will be undertaken in the catchments that have been identified for pilot implementation during Phase 3 of the Adopt-a-River programme (DWAF, 2007) (Table 3-1). The information will be presented in an easily understandable way.

Table 3-1: Rivers and DWAF Offices that are being targeted for pilot implementation of the Adopt-a-River programme

Office	River
Director General:DWAF	**Vaal River**
Regional Offices:	
Kwa-Zulu Natal	**Pongola River**
Limpopo	**Mokolo River**
Mpumalanga	**Olifants River**
Gauteng	**Klip River and Wonderfonteinspruit**
Free State	**Modder and Riet Rivers**
Eastern Cape	**Mtata River and Buffalo River**
Western Cape	**Doring River**
Northern Cape	**Harts River**
North West	**Crocodile River**

Water resource quality is defined in DWAF (2006) as all aspects of water quantity, water quality and aquatic ecosystem quality; the latter including the quality of in-stream and riparian habitats and aquatic biota.

Only published information will be used for this assessment. Potential information sources include the Water Resource Situation Assessment reports, Internal Strategic Perspective (ISP) reports, State-of-the-Rivers reports, reserve studies, basin study reports, and any other water quality reports that are readily available from the Department or its regional offices. Due to the limited budget for this task the spatial coverage and number of issues within each pilot catchment will be comprehensive. However, none of the issues would be described in depth and the reader would be referred to the detailed reports where specific issues have been identified. The key issues would be matched to activities that can be aligned to the objectives of the Adopt-a-River programme. Volunteers commonly monitor a combination of the following features: flow or water level, water temperature, dissolved oxygen, turbidity, pH, habitat, macroinvertebrates, aquatic plants, water transparency, phosphorus and nitrogen, bacteria, and land use.

In many cases catchment reports may only reflect national or WMA concerns and these may not necessarily reflect the concerns of local stakeholders in terms of importance and impacts. Limited stakeholder consultation will be undertaken to confirm the national and WMA concerns, and to add local or site specific concerns. This stakeholder consultation will coincide with interviews and workshops envisaged for Task 3A (Develop institutional framework & governance structure). Furthermore, the assessment report will be sent to the regional offices of the Department for comment.

The output from this activity will be an overview report of key water resource quality concerns in the adopted rivers.

3.4.3 Deliverables

A report describing the water resource quality situation in the ten catchments selected.

Target date: 30 April 2008

3.5 TASK 4: DESIGN MONITORING NETWORK/S

3.5.1 Objectives

Task 4 has two objectives, namely:

- To design appropriate monitoring networks that Adopt-a-River participants can implement and incorporating these into the manuals for the national/regional coordinators and volunteer monitoring manuals.
- Development of manuals for national/regional coordinators and for volunteer samplers.

3.5.2 Approach

The terms of reference for Task 4 of the project specified that this task should determine the water resource quality issues of concern to stakeholders and to design monitoring networks including aspects such as substances of concern, sampling frequency, sampling procedures, analytical procedures, data management and storage, information generation and dissemination.

Two tasks were proposed to meet the stated requirement. The first is to design appropriate monitoring networks that Adopt-a-River participants could implement, and the second task was to document these in manuals so that coordinators and samplers could use.

This task is closely linked to Task 7 (Develop Implementation Manuals for different stakeholder levels), the institutional model identified in Task 3A (Develop an Institutional Framework and Governance Structure), and the water resource quality assessment undertaken in Task 3B.

Adopt-a-River monitoring network(s)

The objective of this activity is to provide coordinators and samplers with guidelines on how to design a monitoring network for a specific catchment or part thereof; and for the specific resource quality issues of concern. These guidelines would be incorporated into the manuals for coordinators and samplers.

Best practice principles for designing a generic monitoring network are well documented (see for instance Sanders *et al*, 2000). These principles would be documented in the first part of the manual in a user-friendly format and supplemented with local experience in designing networks. The generic procedures for monitoring network design include:

- Evaluation of information expectations,
- Establishing statistical design criteria,

- Designing the monitoring network,
- Developing operating plans and procedures, and
- Developing information reporting procedures.

The second part of the manual would consider each substance of concern and describe the specific network design considerations, sampling frequency, sampling procedures, analytical techniques, data management, data storage, data interpretation, and report generation and information dissemination.

The design of monitoring networks will make provision for the constraints faced by volunteer monitoring networks (Rossouw & February, 2006). The design may include a minimal network design that can be implemented by participants just starting out, and a progression to a more complex sampling programme that can be implemented by better resourced and more skilled participants.

Task 4 will use the outputs from the water resource quality assessment undertaken in Task 3B to provide information on resource quality issues of concern in the different areas. These will be consolidated into a list of resource quality concerns for which generic monitoring networks and procedures would be designed. Not all monitoring is amenable to lay volunteer monitoring. Typically volunteers monitor a combination of the following water resource features: flow or water level, water temperature, dissolved oxygen, turbidity, pH, habitat, macroinvertebrates, aquatic plants, water transparency, phosphorus and nitrogen, bacteria, and land use. Other indices that volunteers can monitor include fish, habitat and riparian vegetation.

Development of manuals

It is assumed that implementation of the Adopt-a-River Programme would, at least during the implementation phases, involve national and regional coordinators who will guide and support the activities of volunteer monitors. This task will therefore focus on developing two manuals, one manual for national/regional coordinators, and the other manual for lay volunteer monitors.

Regional coordinator manual - It is envisaged that the national and regional coordinators would initially be DWAF staff or service providers contracted to DWAF. The coordinators would probably have a scientific background and be familiar with the principles of monitoring system design and with commonly used sampling protocols. The coordinators manual would therefore focus on managing volunteers rather than purely on the design of monitoring systems. Care will be taken to ensure that the terminology used in the manual is aligned with the definitions in the Strategic Framework for National Water Resource Quality Monitoring Programmes (DWAF, 2004).

The manual for the regional coordinator will focus on volunteer management and support and will provide for aspects such as establishing a volunteer monitoring network, the rights and responsibilities of volunteer monitors, recruitment of monitors, recognition, the retention of volunteer monitors, and data storage, management and retrieval. Some of the key lessons learned in implementing volunteer programmes will also be discussed. These include: starting small, keep

the monitoring goals realistic, proactive planning, making connections, develop volunteer leadership, pamper your volunteers, and using the data. Lessons learned in implementation of the NMMP and similar programmes in DWAF would also be integrated in this manual.

Volunteer samplers manual – In the Phase 1 report (DWAF, 2006) four volunteer programmes were identified. These were water quality monitoring, aquatic ecosystem health monitoring, inventorying stream flow conditions, and reporting pollution incidents. Given the budget constraints only one manual will be developed that covers these broad topics. The technical content of the manual will be of such a nature that it can be used by as wide a spectrum of volunteers as possible. Volunteers with more advanced interests will be referred to the monitoring manuals that the Department has developed for their national monitoring programmes (e.g. NCMP, NEMP, NMMP, etc.). The topics to be included in the Volunteer Samplers Manual will be identified in close collaboration with the Department's specialists.

The sampling manual for volunteer monitors would introduce monitoring network design (as described above in the preceding section), and for each resource quality issue of concern a description of sample collection, in-field observations or measurements, data manipulation and presentation. Such manuals generally also include background information on the system being monitored in order to provide monitors with a good basic understanding of the physical, chemical and biological behaviour of the systems they are monitoring. In the manual ample use will be made of references to similar manuals in use in South Africa and elsewhere. The sampling manuals designed for the NEMP and NMMP provide good examples of how field sampling techniques can be described. A user-friendly layout and presentation of the information would be followed to ensure acceptance by volunteer samplers who may not have a scientific background or training.

3.5.3 Deliverables

- Adopt-a-River draft monitoring networks report (integrated into the two manuals described below) for comments by the stakeholders.
- Adopt-a-River draft manual for national and regional coordinators and a draft manual for volunteer monitors for a selected environment or monitoring topic for comments by the stakeholders.

Target date: 31 August 2008

3.6 TASK 5: DEVELOP COMMUNICATION STRUCTURES AND DATA MANAGEMENT

3.6.1 Objectives

Tasks and activities associated with Task 5: Development of Communication Structures" follows below. An overview of the communication structures that will be explored and highlights methods which could be used for effective communication, will be provided. The Project Team aims to use

experience gained and lessons learnt from previous projects of a similar nature to make practical recommendations regarding implementation of an appropriate communication structure. To demonstrate familiarity with the above, a communication structure currently in use by Water Services Authorities and Department of Water Affairs and Forestry (DWAF) to more effectively manage drinking water quality is also presented (see Appendix 1). Other initiatives, such as Global Water Watch (www.globalwaterwatch.org) will also be reviewed.

3.6.2 Approach

The objective of this task is to develop the frameworks for two types of communication structures for the Adopt-a-River programme, namely:

- Active communication
- Passive communication

Active Communication

Active communication is aimed at promoting communication between co-ordinators, participants and other stakeholders in the Adopt-a-River programme utilising the principles of "IEP" – Inform, Educate, and Persuade. This therefore includes communication and information dissemination aimed at specific stakeholders or potential stakeholders, with the purpose of creating a response. Specific activities to achieve active communication may include:

- Telephone communication
- E-mail communication
- Monthly/quarterly newsletters
- Presentations (educational, training, etc)
- Exhibitions (environmental and/or water conferences, summits, etc)
- Brochures/pamphlets
- Radio media
- Television media

The appropriateness of the above activities will be explored as part of this project.

A key feature of the approach would be to ensure that the method/s employed for active communication are appropriate to the South African context, and in particular takes into account local circumstance. Experience in the drinking water quality arena has shown that each province, municipality and community can be considered unique, and that an appropriate solution in one region may not be appropriate in another region. It is therefore important that this aspect receive the necessary consideration through a broad consultative process.

Consideration will therefore be given to:

- Classifying different target audiences

  - WMA and local coordinators
  - Adopt-a-River participants
  - National, provincial and local government structures
  - Communities/public
- Identifying the types of information disseminated to each audience group (as per examples presented above)
- Identifying the most appropriate communication channel for that area in order to meet the communication objectives of the Adopt-a-River programme.

Passive Communication

Passive communication is largely aimed at informing and educating Adopt-a-River coordinators, stakeholders and different stakeholder groups through a dedicated platform that allows these individuals to access and review information at any stage.

The general data management system types include:

- Paper files
- Spreadsheets (e.g. Excel)
- Desktop databases (e.g. Access)
- On-line databases (e.g. MySQL)

Mr M Silberbauer, Ms E Vermaak and the Systems Portfolio Manager at CD:WRIM should review this aspect.

Development and implementation of an appropriate data management system requires consideration of:

- Housing
- Set-up costs
- Maintenance
- Security
- Back-up
- Data quality
- Entering data
- Storing data
- Searching data
- Sharing data

The above will need to be considered when choosing the most appropriate data management system for the Adopt-a-River Programme.

In the past, libraries were a central depositary for this kind of information. The internet and the World Wide Web have revolutionised passive communication around the world. Although South

Africa (and the developing world) were initially relatively slow in using these platforms, interest and use thereof in South Africa is rapidly growing. In particular, experience with municipalities has shown that even in remote areas of South Africa (e.g. Northern Cape – Kgalagadi District) with limited access to libraries, internet access has been achieved. As such, use of the internet could potentially provide an excellent platform for making information available that would support Adopt-a-River activities.

Based on current experience and circumstance, it is recommended that an on-line database be considered for the Adopt-a-River Programme.

If an on-line database is selected, the most important question to ask before starting development is ***"What do we want to get out of it?"***

The four key technical components of an on-line database include:

- Operating system (e.g. Microsoft Windows, Linux)
- Database (e.g. MySQL, Oracle)
- Programming language (e.g. Python, XML, C++)
- Web server (e.g. Apache)

Some components may require product purchase from commercial entities whereas other components may be available as open source products.

When planning a database, the following questions should be considered:

1. What resources are available to develop the database (human, software, financial, etc)?
2. What database storage capacity will be required (e.g. server size)?
3. Where will data be stored (e.g. secure off-site location (data centre) and back-up (data centre, offshore or other local data centre), etc)
4. Who will enter data onto the database (programme staff, local data co-ordinator, trained volunteers, all volunteers, etc)?
5. What data will be entered into the database (e.g. water quality, documents, contacts, etc)?
6. What is the desired accuracy of the data entered (e.g. significant figures)?
7. Who will use the data (school groups, volunteers, public, local government, provincial and national government, conservation organisations, etc)?
8. What will the data be used for (e.g. education, baseline information, provincial/national water quality reports, regulation)?
9. How will the data be used (document search, data search, graphical displays, tabular displays, statistical outputs, etc)?
10. What data will be stored (raw data, calculated data, both)?
11. What documents will be stored (references, legislation, education, training, etc)

12. What links will be available (e.g. links to other organisations that participate in Adopt-a-River activities, links to Departmental web sites and staff (Adopt-a-River staff, National, Regional, CMA and local authority staff), contact details, international websites, etc)?
13. Will discussion forums be required (e.g. moderated discussion forums where participants can exchange ideas, raise issues, consult domain experts, etc)?
14. What reports or outputs do you want from the system (documents, graphical displays, tabular displays, spreadsheets, statistics, etc)?
15. What types of graphs are required (e.g. comparison of a single parameter over time at a site, comparison of a single parameter between two sites, comparison of a single parameter over time at multiple sites, etc)?
16. Do you want to export data from the database (e.g. view, print or download information – graph, spreadsheet, etc)?
17. Do you want to e-mail data, notifications or alerts (e.g. to individuals, organisations, etc)?
18. Do you want the database to have mapping capabilities (e.g. point to an area and view data, ability to add GPS co-ordinates)?
19. Do you want to be able to upload photos (e.g. of rivers, issues of concern, etc)
20. How will you control the integrity of the data (e.g. quality assurance and quality control, set range limits, reviewing data before adding to database, set decimal places, programmed calculations, data checks by staff, security, proper training, etc)?
21. How will you control security (e.g. register, username and password, view vs. administration rights – avoid data editing/deletion)?
22. Who will administer the database (e.g. governmental department, service provider, volunteers)?
23. How will database users be trained (individuals, groups (one-to-many), train-a-trainer, on-line vs. workshops, etc)?
24. What internet browsers will be used (e.g. compatibility of Internet Explorer vs. Firefox)?
25. Is a facility for web hosting required (e.g. some organisations may have websites while other organisations may not have the infrastructure to set up their own web site)?
26. Is a Helpdesk required (assist with queries, issues, etc)?
27. Also the need to track whether the database is being used and what value does it add for users.

Considering the above, a website for the Adopt-a-River Programme (front-end or access point to the database for the general user) could include the following aspects:

- Home page
- About us
    - What we do, history, structure, rules, etc
- Register/Get involved
    - How to join, become involved, etc
    - Obtain login details – username and password
    - Membership or volunteer or donation
- Programmes and Projects

- Listing of projects and achievements
- Data
  - Load, view, analysis, reports, etc
- Links
  - Partners, information, other river monitoring websites, government departments (e.g. DWAF), etc
- Educational tools (e.g. for teachers)
  - Information on catchments, water quality, management of rivers, etc
- Training material/modules
  - How to use website, how to monitor, how to interpret data, etc
- Library
  - Newsletters
  - Press releases – current and archive
  - Photo gallery
  - Water quality
  - Maps
- Upcoming events
  - Workshops, meetings, calendar, etc
- Discussion forum
  - Current and archive
- Contact us
- Site search
- Frequently asked questions (FAQs)
- Job postings
- Visitors' signature/counter

The above aspects will be investigated as part of this project. The necessary experience has been gained via roll-out of the eWQMS throughout South Africa to design an appropriate web based communication and information system for the Adopt-a-River Programme.

The two DWAF officials currently involved with the eWQMS are:
Allestair Wensley: Water Services Sub-Directorate: Information and Planning (012 336 8767), and
Leonardo Manus: Water Services Sub-Directorate: Regulation (012 336 6583)

The following section will briefly introduce the electronic Water Quality Management System (eWQMS). More details are presented below and in Appendix 1.

The Electronic Water Quality Management System (eWQMS)

Following considerable success in addressing drinking-water services backlogs throughout South Africa, surveys by the Department of Water Affairs and Forestry (DWAF) have shown that in many instances drinking-water quality in non-metropolitan areas of South Africa is unacceptably poor, with very few WSAs having satisfactory drinking-water quality monitoring programmes and even fewer utilising the data as intended. In order to drive improvement, DWAF and other water sector

partners have undertaken various initiatives to assist WSAs with operation and management of water services. In particular, it was evident that a need existed for a drinking-water quality data capture and information dissemination tool, which would both assist WSAs to meet their responsibilities, and meet DWAF's needs to monitor and regulate the operation of WSAs in a proactive cooperative governance fashion. Consequently DWAF, together with the Institute of Municipal Engineering of Southern Africa (IMESA) rolled out an internet-based Water Quality Management System (eWQMS) to all 169 WSAs in South Africa.

The eWQMS is a well-proven comprehensive Water Quality Management tool, which has been successfully used by WSAs, Regional and National DWAF offices, and the public. The eWQMS has been set up to assist WSAs to meet the National Drinking Water Quality Management Framework requirements, and is a full management system. The eWQMS utilises Open Source Software and is able to guide (i) regulatory compliance by WSAs, (ii) the timeous supportive intervention in water quality failures, (iii) infrastructure improvement, and (iv) capacity development of municipal staff. The eWQMS is accessible via the internet (www.wqms.co.za), and is a very useful means for allowing a range of participating parties (including Water Service Authorities, Provincial and National Government, etc) to guide the tracking, reviewing and improving of water quality. Presently, the eWQMS consists of the following main components:

- Login/Logout
- Water Quality (with various dashboards, overviews, graphs, tables, etc)
- Infrastructure
- Risk Toolbox
- Administration
- Information

Key points regarding eWQMS use and the approach utilized include:

- Raises awareness with regards to Water Quality Management
- Builds on existing Good Practice (i.e. not counter-productive)
- Bottom-up approach – i.e. the system must be useful to users (E.g. provision of reports, notification of issues of concern)
- The system is proven (easy to use, robust, reliable, secure)
- Drives progressive improvement in water quality
- Enables intervention in areas facing public health threats
- Provides strategic data related to the quality of water services to WSAs, DWAF and other sector role players/stakeholders
- Satisfy WSA Governance Requirements
- Support DWAF's regulatory function and satisfy other role player requirements
- Undergo iterative enhancements via WSA and sector feedback

Considering the success to-date of the above approach, it is suggested that a similar system and approach could be utilised for communication purposes for the "Adopt-a-River" Programme.

A more detailed explanation of the eWQMS is included as Appendix 1.

Concluding Remarks

When planning and developing an appropriate data management system, the following key points must be considered:

- Always remember the real purpose of the system (Who are the users? How will they use data? What will the data be used for?)
- No system is perfect the first time. Design the system such that it can be modified and evolve to meet user needs (i.e. need for flexibility)
- Use learning from similar initiatives (What has worked? What has not worked?)
- Ensure good communication at all stages to ensure that requirements are met.

3.6.3 Deliverables

A communication framework for active and passive communication within the Adopt-a-River programme including a Data Management system.

Target date: 30 November 2008

3.7 TASK 6: IDENTIFY TRAINING NEEDS AND REQUIRED TRAINING MATERIAL

3.7.1 Objectives

Task 6 has three objectives:

- Identify the training material that has been developed in South Africa and elsewhere in the world, to support Adopt-a-River type programmes, assess suitability of the material for the Adopt-a-River programme and then identify gaps.
- Communicate development needs to the WRC and learning institutions.
- Initiate the development of additional or more appropriate training material.

3.7.2 Approach

Inventory of training material and gaps analysis

Training material has been developed under the auspices of the Water Research Commission (WRC), the DWAF, or learning institutions to support local programmes such as the River Health Programme (RHP), the National Microbial Monitoring Programme (NMMP), the National Eutrophication Monitor Programme (NEMP), the National Chemical Monitoring Programme (NCMP), Working for Water, 20/20 Vision, and HELP. An Internet search of training material designed to support volunteer monitoring and Adopt-a-River type community-based initiatives indicates that there is a vast amount of material available (Rossouw & February, 2006). An electronic inventory will be compiled of training and other supporting material. The inventory will provide standard bibliographic information such as authors, year, title, source, as well as a short description of the material, and hyperlinks to the web-sites where the original material is housed. A limited library of hard-copy training material will be developed for items that are sourced in hard-

copy format, and which are not housed on the Internet. The database and library will be transferred to the Department on completion of the project. The available material will be assessed in terms of meeting the objectives of the Adopt-a-River programme and a gap analysis will be undertaken to identify additional material that may be required to ensure the smooth implementation of the programme.

The following assumptions were made:

- It is assumed that a fair amount of training material has been developed in other National and local programmes and will be accessible either in electronic format or hard copy;
- The material has been developed by competent individuals with intimated knowledge of cultural differences;
- The material is relevant to the South African environment;
- The material is in a format that is easily accessible and usable;
- The material is tried and tested and accurate.

Benefits:

- Relevant and endemic tailored training programmes locally developed may provide guidance to this project;
- Well tried and tested systems in the South African context may give insight to potentially problematic areas;
- The layout and content of the documents may provide some guidance to what type of publication is effective;
- Regional sentiments on water related issues may be contained in the programmes;
- Worldwide experiences gained from international literature in the development of this type of material;
- Focus efforts on the gaps rather than existing training material;
- With limited effort functional information can be summarised;
- Identifying gaps may focus the teams attention on what matters most;
- The gap analysis is a systematic way to assess the relevant information;
- Compiling a reference list would guide the team members to potential solutions;

Communication of development needs

Where it is necessary to develop additional material that is not essential at the implementation stage of the Adopt-a-River programme, but will become important in subsequent phases, these needs will be communicated to organisations such as the Water Research Commission and other learning institutions. For example, English language manuals may be sufficient to launch the Adopt-a-River programme but in the long term some of the manuals may need to be translated into other official languages for use in areas where the home language of communities is not English.

Challenges will be to identify the relevant individuals to communicate with. Other challenges are:

- The needs may be difficult to communicate;
- The interest of the WRC and other learning institutions may be focused on other issues;

- The identified development needs may not be a focus area of the relevant institutions.

Benefits:

- The WRC and training institutions have the relevant experience to actively participate in the project;
- The WRC and training institutions may have significant institutional memory on similar projects;
- The WRC and training institutions are credible and well known (and well accepted);
- The WRC and training institutions have a productive training systems/systems in place that can be of benefit to the programme.

Initiate the development of additional training material

The proponents are of the opinion that there is sufficient material available locally to support the launch of the Adopt-a-River programme but that some material would need to be customised to meet the institutional framework and governance structure identified in Task 3A. This task would identify the appropriate material and the modifications required. Task 3A and Task 6 would inform the development of such material in Task 7 (Develop Implementation Manuals for different stakeholder levels).

Some of the challenges faced in this task are the following:

- Limited technical data and availability of primary data for the development of training material;
- Other priorities and personal circumstances may influence negatively on the drafting process;
- Too many or too little information may be available to draft the training material;
- Lack of time for the editing process may cause a compromise in quality;
- To achieve a common understanding in the team of the critical issues may create the need for extended meetings.

Benefits:

- Develop a set of documents that can be used Nationally;
- Good drafting practices may result in a usable document that can be utilised throughout South Africa;
- Summarising existing information may create an excellent reference document with a wide applicability;
- Drafting the document may highlight gaps that need to be investigated.

3.7.3 Deliverables

- A document indicating available training material also indicating what additional training material (tools and techniques) would be needed.

Target date: 30 November 2008

- Electronic inventory of available training material
- Limited library of hard copies of training material

Target date: 31 December 2008

3.8 TASK 7: DEVELOP IMPLEMENTATION MANUALS FOR DIFFERENT STAKEHOLDER LEVELS

3.8.1 Objectives

The objective of this task is to develop manuals that are essential for the implementation of the Adopt-a-River programme at different levels.

3.8.2 Approach

This task is dependent on the appropriate institutional framework and governance structure that is identified in Task 3A, and the manuals or guidelines required to implement the Adopt-a-River programme with the selected framework and governance structure. Should the institutional framework and governance structure be similar to that used for the National Microbial Monitoring Programme (NMMP) or the National Eutrophication Monitor Programme (NEMP), then the development of manuals would probably entail modifying existing NMMP or NEMP manuals to meet the needs of Adopt-a-River. If a different institutional framework and governance structure is selected, it may require the development of a new set of manuals, which may be recommended for the next phase. However, an examination of similar programmes in the USA and Australia indicate that most programmes utilise some form of national, regional and local coordination. It is therefore envisaged that existing manuals could be modified for implementation at National level (DWAF: RQS), regional level (CMA/proto-CMAs), and local levels (municipality/WUA). Manuals for Adopt-a-River samplers will be developed in Task 4.

Implementations manuals for different stakeholders are the final and most important deliverables. Development of prototypes should start as soon as possible. The draft manuals may also be useful as communication material, together with the situation assessments, during workshops with the stakeholders.

3.8.3 Deliverables

Implementation manuals for different categories of stakeholders in draft format to distribute for feedback by stakeholders.

Target date: 28 February 2009

3.9 TASK 8: PREPARE FOR PHASE 3 OF THE PROJECT

3.9.1 Objectives

The objective for this task is to summarise the key findings of this project into a main report that includes recommendations for the Pilot Implementation (Phase 3) of the Adopt-a-River programme.

3.9.2 Approach

The main report of this project will be produced in the form of an extended executive summary. The main report would summarise all the outputs from the different tasks, identify the necessary institutional and support infrastructure required to facilitate the implementation of Phase 3 of the project (Pilot implementation) and the report will be concluded with recommendations for the proposed tasks/activities and a way forward for the next phase of the project. This report will also form part of the "Record of Decisions" document.

3.9.3 Deliverables

The main project report, in the form of an extended executive summary, which includes recommendations for Phase 3 of the project (Pilot implementation).

Target date: 30 April 2009

3.10 TASK 9: PROJECT TERMINATION

3.10.1 Objectives

The objective of the project termination task is to provide the Department with a set of final reports in hard copy and electronic formats of the project deliverables and to give a final presentation to the Project Steering Committee.

3.10.2 Approach

The activities that will be undertaken in the project termination task:

- Finalising all the project deliverables and publishing the one hard copy and electronic copies of the documents.
- Giving a final presentation on the project to the key stakeholders in the Department and others interested parties.
- Completing all contractual and administrative arrangements with the Department.

- All reports will be produced in Microsoft Word, spreadsheets will be compiled in Microsoft Excel, and all presentations will be prepared in Microsoft PowerPoint. GIS maps and drawings will be prepared in ArcGIS, in shapefile format conforming to DWAF specifications.
- All reports, maps and drawings will also be converted to PDF format for archiving purposes.
- All photographs will be stored in .JPG format and properly catalogued, listing key aspects such as a description, the location, date, etc., for each photograph.
- All deliverables will be provided in electronic format to the client on CD or DVD with all files clearly referenced and indexed.
- The duplication and distribution of the relevant deliverables to different stakeholders have not been budgeted for and it is assumed that DWAF: Resource Quality Services will be responsible for this component.

3.10.3 Deliverables

One hardcopy master and a set of electronic copies of all deliverables.

Target date: 30 June 2009

4. PEER REVIEW

The Study team supports the concept of peer review. In order to get the maximum benefit from peer review it is essential that peer review happens not only at the end of the technical evaluation, but regularly throughout the technical evaluation, to be able to guide the Study Team.

Dr A Kühn from RQS and Dr William Deutsch of the Alabama University, USA (website: alabamawaterwatch.org, e-mail: wdeutsch@cesag.auburn.edu), will review the technical documents.

If there are costs, RQS will cover that. Dr Deutch will have to review all the products (including the Inception Report) as it becomes available to avoid delays.

5. TECHNICAL STUDY MODULE PROGRAMME

The overall study programme for the main tasks is shown in Table 5-1. The study is estimated to take 18 months to complete. The programme indicates the critical path activities and also the dates at which critical milestones be met (key decision points).

The question marks indicate the proposed months for the Project Management and Steering Committee Meetings. These will be discussed and booked in advance during each meeting.

TABLE 5.1: PROJECT TASKS AND PROGRAMME

	Year	2008												2009					
	Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
	Month no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Task	Description																		
1	**Project inception**																		
2	**Literature survey & development of implementation model**																		
	Literature review																		
	Stakeholder assessment						.....*												
3	**Develop an institutional framework and governance structure**																		
	Institutional framework								.....*										
	Current water quality situation					.....*													
4	**Design monitoring network**																		
	Monitoring networks																		
	Development of manuals																		
5	**Develop communication structures**																		
	Active communications framework												.....*						
	Passive communications framework												.....*						
6	**Identify training needs and required training material**																		
	Inventory of training material																		
	Communication of needs																		
	Initiation of additional material																		
7	**Develop implementation manuals**																		
	Development of implementation manuals																		
8	**Recommendations for Phase 3 project**																		
	Recommendation for Phase 3																		
	Institutional arrangements																		
9	**Project termination**																		
10	**Project management**																		
	PMC meetings		▲27/2		▲22/4			▲30/7			▲1/10			▲			▲		▲
	Steering Committee meetings							▼31/7			▼2/10						▼		

.....* Should new information become available during workshops, this will be added to the reports

6. DELIVERABLES

6.1 STUDY REPORTS

It is envisaged that the following reports will be produced in one hardcopy master and a set of electronic copies of all deliverables:

1) An Inception Report;
2) A volunteer water resource quality monitoring model or models appropriate for the Adopt-a-River programme under South African conditions in a literature review document
3) A database of stakeholders.
4) An institutional framework and governance structure for the Adopt-a-River programme
5) A report describing the water resource quality situation in the ten catchments identified by the Department.
6) Adopt-a-River manuals for national and regional coordinators (includes a section on network design).
7) A method manual for volunteer monitors.
8) A communication framework for active and passive communication and a data management system for the Adopt-a-River programme
9) Report on the inventory of available material, gap analysis, communication with the WRC and other learning institutions on further developments required, and requirements of additional training material for piloting the Adopt-a-River programme including an electronic inventory of available training material and a limited library of hard copies of training material
10) A summary report with recommendations for Phase 3 of the project (Pilot implementation) including the institutional arrangements to support the implementation of Phase 3 of the Adopt-a-River project

6.2 PROGRESS REPORTS

Progress reports will be produced in the format as prescribed by the Client. Progress reports will be submitted prior to each Project Management and Study Team Meeting, which will be an effective way to obtain comments on progress and provide opportunities for questions. Cost management will be addressed in the progress reporting to ensure adequate tracking and reporting of technical versus financial progress. The progress report will contain the following information per Task:

1) Progress,
2) Issues, and
3) Impacts on Programme.

6.3 OTHER DELIVERABLES

In addition to various reports described, other deliverables arising from this study which do not form part of the reports such as maps, plans, etc. on suitable scales, indicating all relevant detail and data and information collected during the study will be made available to the Client if required.

The proposed implementation programme and associated cash flow will also be produced and revised during the study as required. Annual cash flows (from April to March of each year) for the DWAF budgeting process will also be provided.

6.4 REPORTING FORMATS

The consultant will present all the relevant information in a bound report or suite of reports. The report will also be submitted in the required electronic format. The Consultant will design and create a format where the complete set of reports will be stored on disc so that all information can be easily accessed and reproduced by using a Portable Document Format (PDF). The electronic format of the Report (CD) will be handed over to the Client together with the final report. All data that have a spatial reference will be captured in Arc/Info GIS.

7. PROJECT ADMINISTRATION

The success of a project of this nature is dependent on sound technical input and proper project management and financial control. The study team will give advice and make recommendations but the Client will make major decisions. Approval for such decisions will be obtained through the Client's nominated representative.

In summary, the following tasks will be undertaken by the PSP under project management:

- Co-ordination of technical aspects and preparation and issuing of progress reports in terms of the Client's requirements;
- Budget preparation, monitoring and other administrative matters;
- Monthly management and other intermediate meetings, including drafting agendas/or programmes, taking and distributing the minutes to DWAF and PSP Team members and,
- Reviewing of draft reports.
- Project termination as described in Task 9.

7.1 CLIENT

The Department of Water Affairs and Forestry (DWAF) is the Client for the study. The Directorate: Resource Quality Services will manage the study for the Client.

The Client will be responsible for the duplication and distribution of the relevant deliverables to different stakeholders. These have not been budgeted for.

7.2 PROJECT MANAGEMENT AND STUDY TEAM

A Project Management and Study Team, chaired by the Project Co-ordinator, Mr R Sekwele will undertake the day-to-day management of the study. The Study Manager of DWAF will attend all Project Management and Study Team and Steering Committee meetings and will be responsible for the overall management of the Study. Two-Monthly progress meetings by the Project Management and Study Team, to monitor progress and expenditure against the programme and to discuss and clarify issues which might arise, have been provided for. The meeting venues will be held in the offices of DWAF at Roodeplaat Dam.

The Consultant team will record proceedings of such meetings, make presentations at such meetings if required, distribute all agendas and minutes, and will undertake other related administrative tasks that may be required. The Consultant shall keep an up-to-date record of all decisions taken in the process of the study. The record shall identify the issues raised, findings of investigations and decisions taken. This will be the Record of Decision document

7.3 PROJECT HUMAN RESOURCES

7.3.1 TEAM COMPOSITION

Linda Rossouw will be the lead consultant. Sub-consultants will include Ninham Shand, Yolande Burger and Emanti Water and Environmental Engineering Services.

The organogram of the project team is as shown in Figure 7-1.

7.3.2 KEY PERSONNEL

Ms Linda Rossouw (MSc, Pr Sci Nat.), will fulfil the role of Study Leader on this project but will also play a technical role. Mrs. Rossouw has been involved in various related project since starting work in the 1980's as an environmental scientist with an MSc in Limnology.

Ms Yolande Burger is the Deputy study leader and Task leader. She is an engineer with 30 years of professional experience. She has a BSc degree in Civil Engineering and a Masters degree in Business Administration. She specialises in viability studies of civil engineering infrastructure, including infrastructure operation and maintenance.

Ms Neumann is a Task leader and has 7 years experience as a Public Participation Practitioner. This includes the planning, execution and financial management of the Public Participation Processes for Screening, Scoping, Basic Assessments and Environmental Impact Assessments on applications ranging from Roads, Townships, Soccer Stadiums, Filling Stations, Golf Estates and other developments.

Mr Nico Rossouw is a Task leader, who has a masters degree in Limnology and is a registered Professional Natural Scientist, has over has 26 years of experience working as a water quality specialist on river and reservoir systems in Southern Africa.

Mr Philip de Souza is a Task leader with experience in Electronic Drinking Water Quality Management System development, testing, implementation, training, roll-out, on-going maintenance, support, etc.

7.3.3 TASK LEADERS

The Task Leaders will manage the various tasks. They are responsible for directing and co-ordinating the personnel working on each task, as well as ensuring technical correctness and applicability. They will ensure that each task is completed within budget and time, to acceptable standards. Their responsibility is also to provide timeous and adequate warning of any problems encountered, which can either delay the study or result in budget overruns.

7.3.4 HDI COMPONENT

Building capacity of historically disadvantaged individuals (HDIs) in the fields of water resource planning and development, and environmental management, is viewed as an integral part of any study.

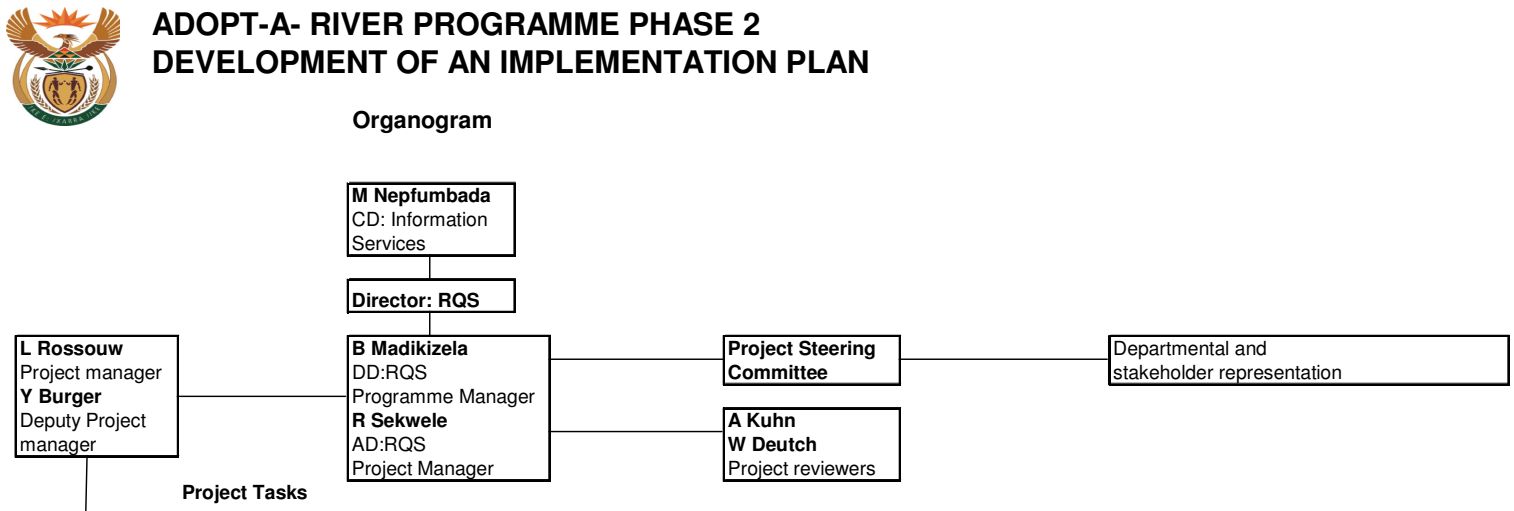
Capacity building entails giving HDIs the requisite practical exposure and background training to be able to participate meaningfully in the study. There are a few inexperienced HDI members who will benefit from the project by working under the supervision of the Task Leaders who are all experts in their respective fields.

Thabisa Manxodidi, from Emanti Management, is a young chemical engineer in training. Ms Haneem Hendriks from Ninham Shand Consulting Services is a candidate engineer. Both of them will benefit in terms of gaining experience and being able to work independently on similar projects in future.

7.4 PROJECT STEERING COMMITTEE MEETINGS

The Project Steering Committee will consist of various internal and external stakeholders who will give the study guidance. The Steering Committee meetings will be organised by the Project Co-ordinator, Mr R Sekwele. Representatives from the Technical module may be requested to attend or to make a presentation to the Steering Committee, should the need arise. Three Steering Committee meetings have been proposed as was illustrated in Table 5.1

Figure 7-1: Team Composition



Task	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	Task 9
Short title	**Project Inception**	**Literature survey**	**Instititional framework**	**Monitoring networks**	**Communication Structures**	**Training needs**	**Implementation manuals**	**Phase 3 Recommendations**	**Project termination**
Task leader	L Rossouw	L Rossouw	Y Burger	N Rossouw	P de Souza	A Neumann	L Rossouw	L Rossouw	L Rossouw
Team members	Y Burger A Neumann P de Souza N Rossouw	A Neumann Y Burger	A Neumann N Rossouw H Hendriks S Swartz	H Hendriks P de Souza A Neumann T Manxodidi G Mackintosh W Retief R Compaan	A Neumann T Manxodidi R Compaan G Mackintosh W Retief N Rossouw	H Hendriks L Rossouw P de Souza T Manxodidi G Mackintosh	A Neumann Y Burger P de Souza N Rossouw T Manxodidi G Mackintosh C Beuster	Y Burger P de Souza A Neumann N Rossouw	Y Burger R Compaan

Since acceptance of the proposal by the DWAF, Ms S Maharaj has resigned from Ninham Shand to pursue studies overseas. She will be replaced by Ms Haneem Hendriks with no impact on the project budget or HDI status of the project.

8. COST ESTIMATE

8.1 GENERAL ITEMS

8.1.1 Form of agreement

The standard DWAF form of agreement is the legal binding document between the Client and Consultant.

8.1.2 Value added Tax (VAT)

All fee and cost items shown in this report exclude VAT, except where otherwise indicated.

8.2 PROFESSIONAL FEES

Professional fees are determined according to the document *Policy Guidelines on the Remuneration and Reimbursement of Consultants* of DWAF and are contained in the Agreement. A breakdown of the professional fees per study task is presented in Table 8-1.

Table 8-1: Professional Fees per Study Task

	TASK	COST ESTIMATE (RAND)
1	Project Inception	R 47,506
2	Literature survey & implementation model	R 84,646
3	Institutional framework & Governance Structure	R 114,052
4	Monitoring networks	R 110,203
5	Communication structures/Data Management	R 111,120
6	Training needs & required training material	R 44,966
7	Implementation manuals	R 70,320
8	Phase 3 Recommendations	R 47,586
9	Project management	R 127,964
10	Project termination	R 27,840
	Total excluding VAT	**R 786,203**

The Human Resources, Time and Cost Schedule Table is included in **Appendix 2**.

8.3 DISBURSEMENTS

All external invoices will be recoverable at cost. Travel costs will be recovered at the rates advised by DWAF. The estimated disbursements are as listed in Table 8-2.

Table 8-2: Disbursements

Travel expenses (specify, for example rate/km and total km, class of air travel, etc.). Only actual cost is recoverable. Proof of the expenses incurred must accompany certified invoices.			
Description of expense to be incurred	**Rate**	**Quantity**	**Amount**
Travel	R3.02/km	1 000	R3 020
Car hire (Group A)	R650/day	15	R9 750
Flights (Economy) Cpt-Jhb and Jhb to Cpt	R3000/r flight	18	R54 000
Total (excluding VAT)			R66 770
Other expenses, for example accommodation (specify, e.g. three star hotel, bed and breakfast, telephone cost, reproduction cost, etc). On the basis of these particulars, certified invoices will be checked for correctness. Proof of the expenses must accompany invoices.			
Description of expense to be incurred	**Rate**	**Quantity**	**Amount**
Accommodation (Bed and Breakfast)	R550/night	18	R9 900
Per diem	R100	18	R1 800
Other incidental costs, photo's, maps, parking fees, meals	R100	20	R2 000
Copying	Lump sum		R8 000
Total (excluding VAT)			R21 700
Rates for communication (Telephone calls and faxes)			
Description of expense to be incurred	**Rate**	**Quantity**	**Amount**
Courier services	R50	20	R1 000
Postage	Lump sum		R1 000
Total excluding VAT			R2 000
Total Disbursements (excluding VAT)			R90 470

8.4 CONTINGENCIES

No contingencies have been allowed for by the PSP.

8.5 SUMMARY OF STUDY COST ESTIMATE

The estimated total cost of the study is shown in Table 8-3.

Table 8-3: Total Cost Estimate

ITEM	COST ESTIMATE (RAND
Professional Fees	R 786,203
Disbursements and Infrastructure	R 90,470
Total excluding VAT 14%	R 876,673
VAT	R 122,734
TOTAL INCLUDING VAT	R 999,407
Escalation	
TOTAL INCLUDING VAT AND ESCALATION	**R 999,407**

8.6 PROJECTED CASH FLOW

The projected cash flow schedule for the study is shown in Table 8-4.

8.7 HDI PARTICIPATION

The HDI participation in terms of work and allocated hours are presented below in Table 8-5.

Table 8-5: HDI Participation

Tasks	Task Description	Value of Work HDI	Value of Work Non HDI
1	Project Inception	R 30,082	R 17,424
2	Literature survey & implementation model	R 84,646	R -
3	Institutional framework & Governance Structure	R 93,604	R 20,448
4	Monitoring networks	R 57,443	R 52,760
5	Communication structures/Data Management	R 57,608	R 53,512
6	Training needs & required training material	R 44,966	R -
7	Implementation manuals	R 56,808	R 13,512
8	Phase 3 Recommendations	R 30,162	R 17,424
9	Project management	R 84,404	R 43,560
10	Project termination	R 21,440	R 6,400
		R 561,163	R 225,040

Value of work undertaken by HDI team members	71.38%

Tasks	Task Description	Man hours HDI	Man hours Non HDI
1	Project Inception	72	32
2	Literature survey & implementation model	208	-
3	Institutional framework & Governance Structure	272	32
4	Monitoring networks	200	96
5	Communication structures/Data Management	200	112
6	Training needs & required training material	144	-
7	Implementation manuals	160	24
8	Phase 3 Recommendations	72	32
9	Project management	200	80
10	Project termination	48	16
	TOTAL	1,576	424

Hours allocated to HDI team members	78.8%

Table 8-4: Projected Cash Flow per Financial Year

ADOPT-A-RIVER CASHFLOW

		Financial year 2007/08			Financial year 2008/09												Financial year 2009/10		
		Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09
	Task total																		
Project Inception	R 47,505.60	R 43,905.60	R 3,600.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00
Literature survey & implementation model	R 84,646.40	R 0.00	R 0.00	R 42,323.20	R 42,323.20	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00
Institutional framework & Governance Structure	R 114,052.00	R 0.00	R 0.00	R 24,928.00	R 26,880.00	R 22,801.60	R 19,201.60	R 20,240.80	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00
Monitoring networks	R 110,203.20	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 21,024.00	R 45,345.60	R 43,833.60	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00
Communication structures	R 111,120.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 36,794.40	R 36,482.40	R 37,843.20	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00
Training needs & required training material	R 44,966.40	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 9,441.60	R 14,162.40	R 21,362.40	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00
Implementation manuals	R 70,320.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 23,389.60	R 46,930.40	R 0.00	R 0.00	R 0.00	R 0.00
Phase 3 Recommendations	R 47,585.60	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 7,200.00	R 40,385.60	R 0.00	R 0.00
Project management	R 127,964.00	R 3,600.00	R 18,392.80	R 3,600.00	R 3,600.00	R 18,392.80	R 3,600.00	R 3,600.00	R 18,392.80	R 3,600.00	R 3,600.00	R 14,792.80	R 3,600.00	R 3,600.00	R 18,392.80	R 0.00	R 3,600.00	R 3,600.00	R 0.00
Project termination	R 27,840.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 0.00	R 7,200.00	R 20,640.00
PROF FEE TOTALS	R 786,203.20	R 47,505.60	R 21,992.80	R 70,851.20	R 72,803.20	R 41,194.40	R 22,801.60	R 44,864.80	R 63,738.40	R 84,228.00	R 49,524.00	R 66,798.40	R 24,962.40	R 26,989.60	R 65,323.20	R 7,200.00	R 43,985.60	R 10,800.00	R 20,640.00
Disbursements	R 90,470.00	R 0.00	R 9,047.00	R 4,523.50	R 18,094.00	R 0.00	R 9,047.00	R 0.00	R 9,047.00	R 0.00	R 18,094.00	R 0.00	R 4,523.50	R 0.00	R 0.00	R 0.00	R 13,570.50	R 0.00	R 4,523.50
TOTAL (excl VAT)	R 876,673.20	R 47,505.60	R 31,039.80	R 75,374.70	R 90,897.20	R 41,194.40	R 31,848.60	R 44,864.80	R 72,785.40	R 84,228.00	R 67,618.00	R 66,798.40	R 29,485.90	R 26,989.60	R 65,323.20	R 7,200.00	R 57,556.10	R 10,800.00	R 25,163.50
VAT	R 122,734.25	R 6,650.78	R 4,345.57	R 10,552.46	R 12,725.61	R 5,767.22	R 4,458.80	R 6,281.07	R 10,189.96	R 11,791.92	R 9,466.52	R 9,351.78	R 4,128.03	R 3,778.54	R 9,145.25	R 1,008.00	R 8,057.85	R 1,512.00	R 3,522.89
TOTAL (Incl VAT)	R 999,407.45	R 54,156.38	R 35,385.37	R 85,927.16	R 103,622.81	R 46,961.62	R 36,307.40	R 51,145.87	R 82,975.36	R 96,019.92	R 77,084.52	R 76,150.18	R 33,613.93	R 30,768.14	R 74,468.45	R 8,208.00	R 65,613.95	R 12,312.00	R 28,686.39
		Total financial year 2007/08		**R 175,468.91**										**Total financial year 2008/09**		**R 803,253.35**	**Total financial year 2007/08**		**R 106,612.34**

9. REFERENCES

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APPENDIX 1

An Introduction to the Electronic Water Quality Management System (eWQMS)

APPENDIX 2

The Human Resources, Time and Cost Schedule

Proposal: Adopt a River Progarmme Phase 2: Development of an Implementation Plan

Human Resources Budget (Mandays)

		L Rossouw	Y Burger	Ninham Shand					Emanti Management					
	Name	L Rossouw	Y Burger	N Rossouw	A Neumann	S Maharaj	S Swartz	C Beuster	P de Souza	T Manxodidi	R Compaan	G Mackintosh	W Retief	
	Hourly rate	450	440	639	320.1	270	244	193.5	450	300	400	600	200	
	Daily rate	3600	3520	5112	2560.8	2160	1952	1548	3600	2400	3200	4800	1600	
	Task													**TOTAL**
1	Project Inception	4	3	2	2				2					47,505.60
2	Literature survey & implementation model	10	8		8									84,646.40
3	Institutional framework & Governance Structure	2	12	4	5	10	5							114,052.00
4	Monitoring networks			5	4	10			4	10	1	2	1	110,203.20
5	Communication structures			1	10				5	10	5	3	5	111,120.00
6	Training needs & required training material	2			8	8								44,966.40
7	Implementation manuals	6	3	1	5			3	1	3		1		70,320.00
8	Phase 3 Recommendations	5	2	2	2				2					47,585.60
9	Project management	15	5	5	5				5					127,964.00
10	Project termination	4	2								2			27,840.00
	Total mandays per person	**48**	**35**	**20**	**49**	**28**	**5**	**3**	**19**	**23**	**8**	**6**	**6**	
												Total human resources		**786,203.20**
	Disbursement costs													
	Travel													3,020.00
	Car hire													9,750.00
	Flights													54,000.00
	Accommodation													9,900.00
	Per diem													1,800.00
	Other incidental costs													2,000.00
	Copying													8,000.00
	Courier services													1,000.00
	Postage													1,000.00
													Total disbursements	**90,470.00**
													Total excluding VAT	**876,673.20**
													14% VAT	122,734.25
													TOTAL including VAT	**999,407.45**