**REPUBLIC OF NAMIBIA**

# MINISTRY OF AGRICULTURE, WATER AND FORESTRY

## EoI 1/18/2 – 02/2011

## A PRE-FEASIBILITY STUDY INTO:

## *THE AUGMENTATION OF WATER SUPPLY TO THE CENTRAL AREA OF NAMIBIA AND THE CUVELAI*

# ENVIRONMENTAL AND SOCIAL INCEPTION REPORT: *TECHNICAL PORTION*

**30 APRIL 2013**

**SUBMITTED BY:**

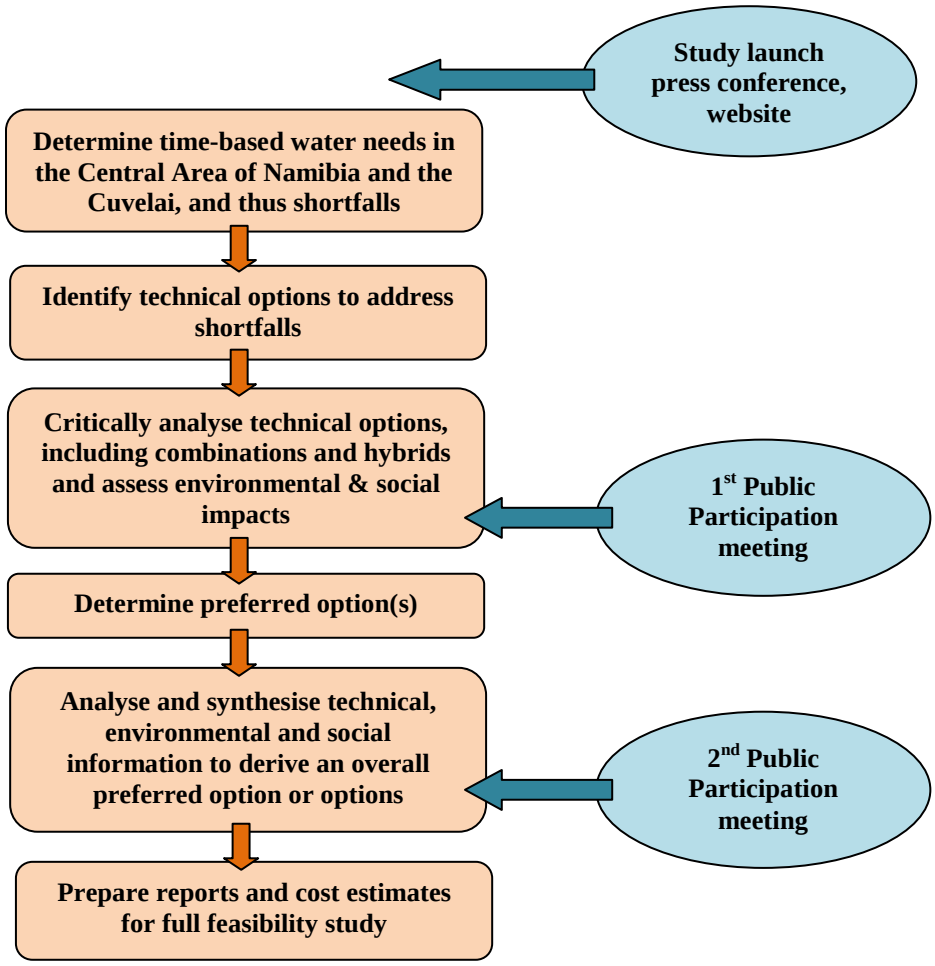
Sustainable Solutions Trust (for the EIA)
Southern African Institute for Environmental Assessment (external review)

# PREFACE

The background to this Pre-feasibility Study into the Augmentation of Water Supply to the Central Area of Namibia and the Cuvelai is set out in the Engineering Inception Report. The key elements pertinent to the Environmental and Social components of this study are:

1. The environmental and social component (investigation and assessment) will be completely separate from the engineering component of the Study. Independent consulting teams will be appointed to work on these project components,
2. The first phase of this Project will be a desk study, pre-feasibility investigation into alternative water sources for the Cuvelai and Central Areas of Namibia,
3. The engineering and environmental/social components will synchronise their work for optimum efficiency, and
4. The Southern African Institute for Environmental Assessment (SAIEA) will provide ongoing external review of this Study to ensure that best practices are applied.

The technical sequence of events for this Study is as follows:




The environmental and social component of this Study is largely reactive to the findings of the engineering team in terms of water needs and technical options to meet the needs. While some

options may be sensibly anticipated, detailed planning in terms of skills and time needed by the environmental and social component are based on some general assumptions. These may need to be reviewed as the Study unfolds.

This document consists of the **Technical Component** of the Environmental and Social Inception Report and contains the tasks and activities associated with the Pre-Feasibility Study investigations into "*The Augmentation of Water Supply to the Central Area of Namibia and the Cuvelai*". This document contains a brief methodology detailing how the Consultants envisage undertaking these tasks and activities.

The Financial Component of the Inception Report, submitted as a separate document, contains the cost estimates associated with the tasks and activities outlined in this Environmental & Social Component of the Technical Inception Report.

This Inception Report should be read in conjunction with the corresponding Engineering Inception Reports.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| BWMP | Bulk Water Master Plan |
| CAN | Central Area of Namibia |
| CoW | City of Windhoek |
| CUV | Cuvelai Area of Namibia |
| DEA | Department of Environmental Affairs, Ministry of Environment and Tourism |
| DPC | Dynamic Prime Cost |
| DRM | Directorate of Resource Management |
| DWA | Department of Water Affairs |
| DWAF | Department of Water Affairs and Forestry |
| EIA | Environmental Impact Assessment |
| EoI | Expression of Interest |
| ENWC | Eastern National Water Carrier |
| EPSMO | Environmental Protection and Sustainable Management of the Okavango River Basin |
| GDP | Gross Domestic Product |
| IAP | Interested and Affected Parties |
| IFA | Integrated Flow Assessment |
| IWRM | Integrated Water Resources Management |
| IWRMP | Integrated Water Resources Management Plan |
| $Mm^3/a$ | Million cubic metres per annum |
| MAR | Managed Aquifer Recharge |
| MET | Ministry of Environment and Tourism |
| MAWF | Ministry of Agriculture, Water and Forestry |
| NamPower | Namibia Power Corporation |
| NamWater | Namibia Water Corporation Ltd |
| OKACOM | Permanent Okavango River Basin Water Commission |
| PJTC | Permanent Joint Technical Commission for the Kunene River |
| PSC | Project Steering Committee |
| SADC | Southern African Development Community |
| SSE | Strategic Scoping Exercise |
| ToC | Table of Contents |
| ToR | Terms of Reference |
| UN | United Nations |
| UNESCO | United Nations Educational, Science and Cultural Organisation |
| WEAP | Water Evaluation and Planning System |
| WMARS | Windhoek Managed Aquifer Recharge Scheme |
| WDM | Water Demand Management |
| WMAR | Windhoek Managed Aquifer Recharge |
| WTC | Water Transfer Consultants |

# CHAPTER 1 : HISTORY TO STUDY

The history to this study is set out in detail in the Engineering Inception Report. We summarise it here.

Open advertisement on 14 July 2011 by Ministry of Agriculture, Water & Forestry (MAWF) for expressions of interest for the feasibility study of the "*Kavango Link to the Eastern National Water Carrier and to the Cuvelai Water Supply Scheme*".

Lund Consulting Engineers CC (**LCE**) & Seelenbinder Consulting Engineers CC (**SCE**) formed a joint venture and, with several other experts (the consortium called "the Consultant"), submitted an Expression of Interest to MAWF on 09 August 2011.

Submissions were evaluated by MAWF &NamWater, and the LCE – SCE Consortium was appointed to prepare a Terms of Reference (**ToR**) document for the Consultancy Services for a Feasibility Study into the "*Kavango Link to the Eastern National Water Carrier and to the Cuvelai Water Supply Scheme*"

The first Project Meeting between the Client and the Consultant was held on 15 November 2011. The first task of the Consultant was to prepare and submit a ToR for a feasibility study to secure water supply to the Central Area of Namibia, the Cuvelai area and parts of the Otjozondjupa Region. The 1st Draft ToR document prepared by the Consultant was submitted to the Client in electronic format on 17 February 2012, who distributed it to various stakeholders.

Comments from the Client and stakeholders were received in early March 2012. These implied that a re-definition of, and a revised approach to, the feasibility study was required. Project Meeting No. 2 between the Client and the Consultant was held on 20 March 2012 at which it was determine that:

1. The Consultant will report to a Project Steering Committee (**PSC**), to be formed between the MAWF and NamWater;
2. The Environmental and Social Component (investigations and assessments) will be completely separate from the Engineering Component of the Study. Independent consultancy teams will be appointed to work on these project components, as required by the Equator Principles;
3. The first phase of this Project will be a desk study, pre-feasibility investigation into alternative water sources for the Cuvelai and Central Areas of Namibia. This first phase of the Project will therefore consider all realistically available options. This changed emphasis is required for adherence to the Equator Principles;
4. The title of the Project, at least for the first phase, will be changed to the following: "***Augmentation of Water Supply to the Central Area of Namibia and the Cuvelai"***; and
5. The 1st Draft ToR of 17 February 2012 will be discarded and the Consultant will submit a new ToR on the basis of the above.

A 2nd Draft ToR document was submitted to both the MAWF and NamWater in electronic format on 26 June 2012. Project Meeting No. 3 between the MAWF, NamWater, the City of Windhoek (**CoW**) and the Consultant was held on 02 November 2012 to review the ToR. Based on the feedback a Final ToR document was prepared for a Technical Pre-Feasibility Study into "*The Augmentation of Water Supply to the Central Area of Namibia and the Cuvelai*" and submitted to the PSC (now consisting of representatives from the MAWF, NamWater and the CoW) in electronic format on 19 February 2013.

The Consultant was appointed to prepare an Environmental and Social Inception Report to define the scope and cost of services expected for a Pre-Feasibility Study. The Inception Report details the activities which are to form part of the envisaged Pre-Feasibility Study into the Project. A proposed Task Matrix, Implementation Programme and Budget which include time frames and a cost estimate for these activities are included.

This document consists of the **Technical Component** of the Environmental and Social Inception Report, which is based largely on the (final) ToR document of 19 February 2013, setting out the tasks and activities which are to be undertaken for the Pre-Feasibility Study investigations into "*The Augmentation of Water Supply to the Central Area of Namibia and the Cuvelai*".

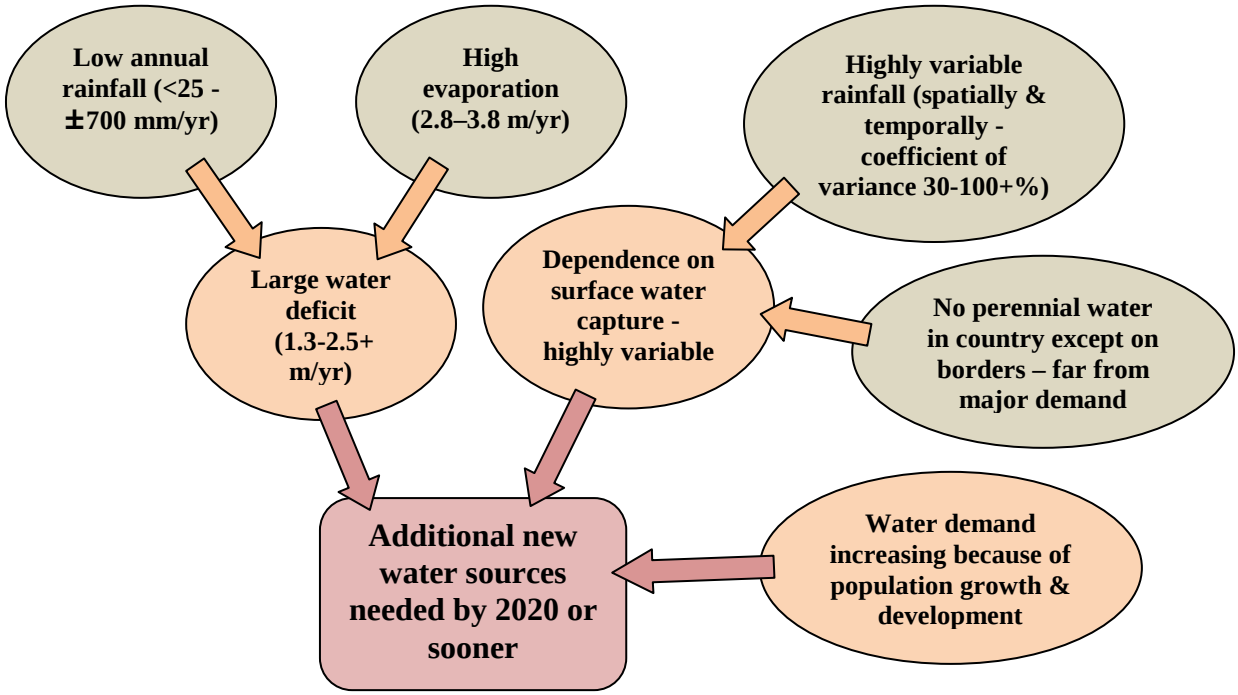
This Technical Component also contains a Project Schedule for the various activities envisaged to form part of the Pre-Feasibility Study.

The Financial Component of the Environmental and Social Inception Report, submitted as a separate document, contains the cost estimates associated with the tasks and activities outlined in this Technical Component of the Environmental and Social Inception Report.

# CHAPTER 2 : BACKGROUND

## 2.1 THE WATER SUPPLY DILEMMA IN NAMIBIA

The constraints on water supply in Namibia are explained in the Engineering Inception Report. We summarise them here schematically.




## 2.2 PROJECT BACKGROUND

### 2.2.1 Importance of the Central Area and the Cuvelai

The Central Area of Namibia (CAN) and the Cuvelai area play important roles in the social and economic development of the country. Both areas experience population and economic growth rates well above the average for Namibia. Both areas are prone (presently and in the near future) to water supply interruptions which jeopardise prospective new economic growth. Most of the water sources within the CAN and the Cuvelai have been developed and are nearing the limit of their supply potential. Further development and growth in both the CAN and the Cuvelai, and by extension in Namibia as a whole, is dependent on securing long-term water supply. Failure to do will result in reduced economic activity with serious social and economic consequences. For more details see the Engineering Inception Report.

### 2.2.2 The Investigation into Alternative Water Sources

The history of water sources and their development are set out in the Engineering Inception Report and summarised in the table below.

**History of water source development for the CAN**

| Year | Source |
|---|---|
| 1960s & prior | Towns relied on own local water supplies |
| 1970 | Von Bach Dam (48.6 Mm³) constructed, 70 km from Windhoek |
| 1977 | Swakoppoort Dam (63.5 Mm³) completed, 100 km from Windhoek |
| 1982 | Omatako Dam (43.5 Mm³) completed, 200 km from Windhoek |
| 1987 | Eastern National Water Carrier completed, linking Grootfontein to Omatako Dam |
| 1988 ongoing | Three dams operated conjunctively via operating rules to reduce evaporation losses and optimise yield |
| 1988 ongoing | Three-dam system backed up by and used in conjunction with sources such as Karst lV groundwater, water from the Kombat and Berg Aukas mines, and the Windhoek aquifer to increase yield and assurance |
| 2002 | Advanced reclamation plant in Windhoek completed,<br>Old Goreangab Water Reclamation Plant upgrades – "grey" water for sports fields, etc,<br>Development of the Windhoek Aquifer for aquifer recharge and water banking, and<br>Introduction of block tariffs and other Water Demand Measures in Windhoek, and thereafter in a few other centres |
| 2004 | *Feasibility Study on Water Augmentation to the Central Area of Namibia* completed with following options:<br>• Emergency abstraction from the Tsumeb and Karst III aquifers,<br>• Managed Aquifer recharge of the Windhoek Aquifer with deep well drilling,<br>• Emergency abstraction from the Okavango River as and when required, and<br>• Continuous low volume abstraction from the Okavango River to supply water for Managed Aquifer Recharge of the Windhoek Aquifer |
| Post 2004 | Windhoek Managed Aquifer Recharge Scheme, in conjunction with deep well drilling in the aquifer implemented. Some scope to extend deep well drilling further |
| 1997 | Feasibility study on measures to augment and secure the water supply to the CAN by completing the Okavango – Grootfontein pipeline link of the ENWC completed. For an estimated capacity of 17.28 $Mm^3/a$, the proposed Rundu – Grootfontein or *Kavango Link* of the ENWC was estimated to cost (in 1997 terms) N$ 603 million |
| 2013 | This *Pre-feasibility Study into the Augmentation of Water Supply to the Central Area of Namibia and the Cuvelai* begins. |

### 2.2.3 The Need for this Study

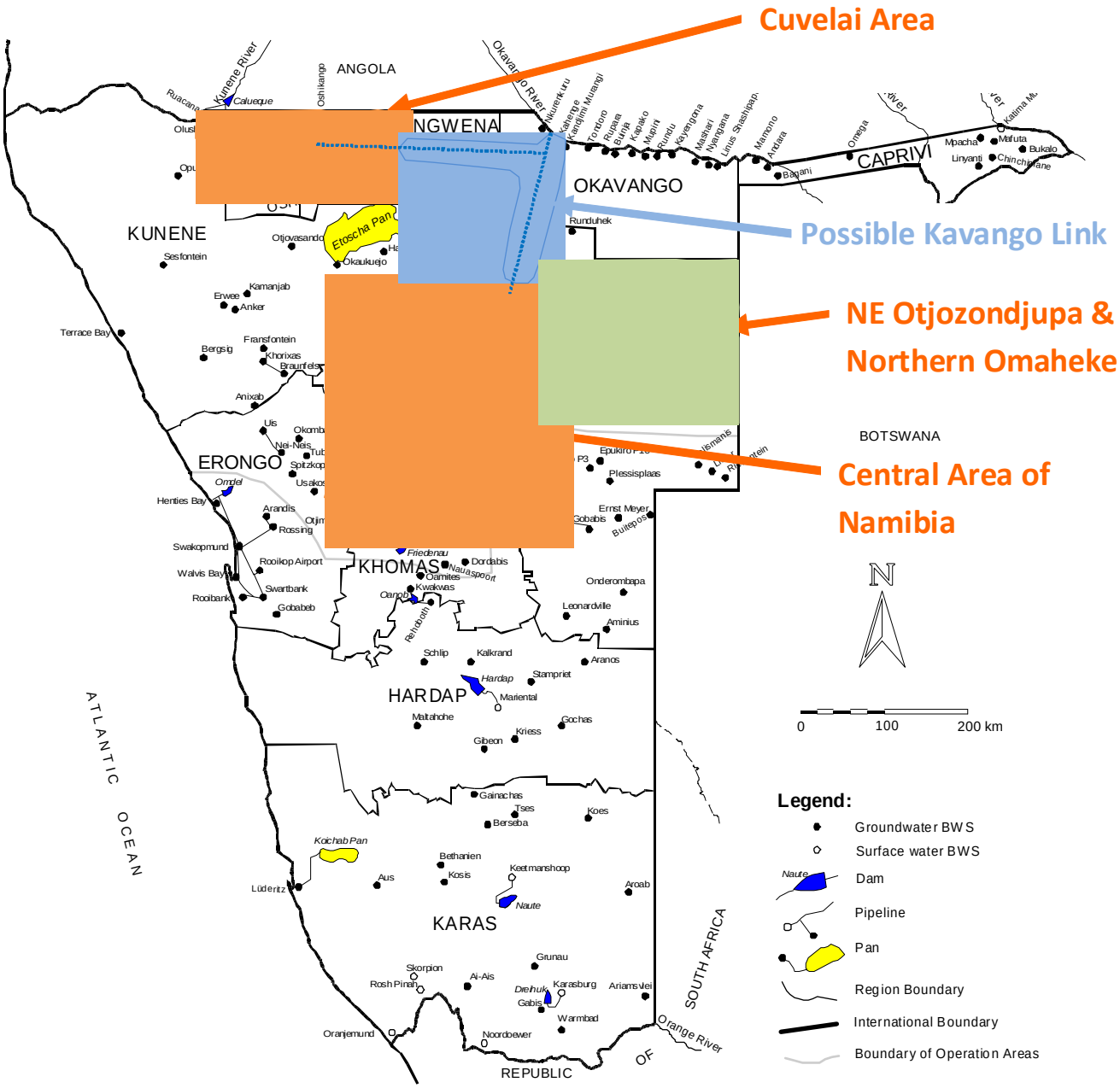
Long-term water security for the CAN and the Cuvelai areas requires further investigation. The investigation needs to identify future water demands, the feasible options available to meet the water demands, the preferred option(s) (including possible combinations and hybrids) based on engineering, environmental, social and economic assessments, so that the recommended measures can be implemented before any shortfall occurs, which on the basis of recent demand modelling, is forecast to be in the region of 2020.

Previous studies into alternative water sources for the CAN did not include the Cuvelai area, nor the areas east of Okakarara and north-east of Otjinene.

## 2.3 STUDY AREA

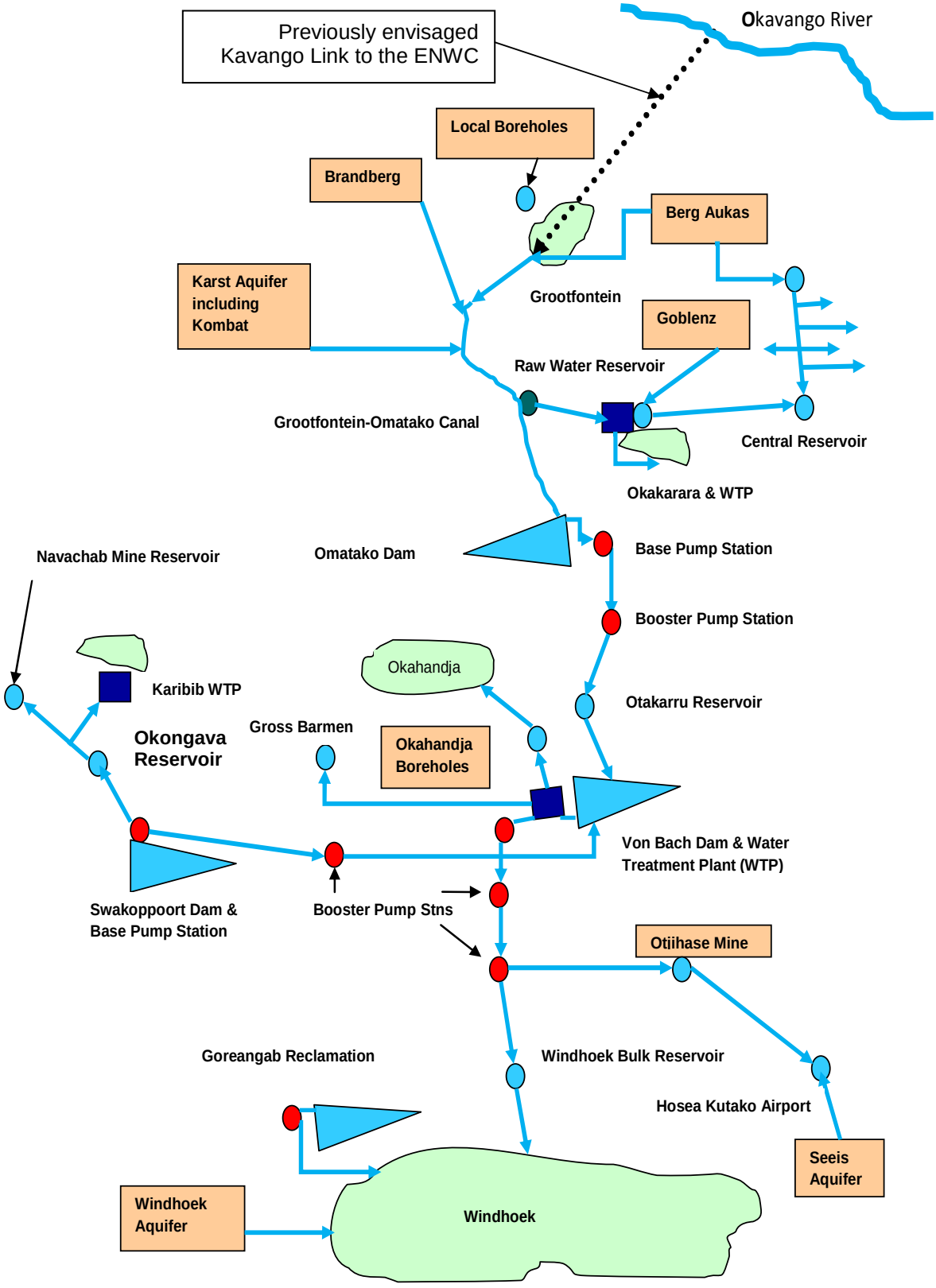
The Study Area is shown in **Figure 2.1** below.

**Figure 2.1: Preliminary Extent of the Study Area**



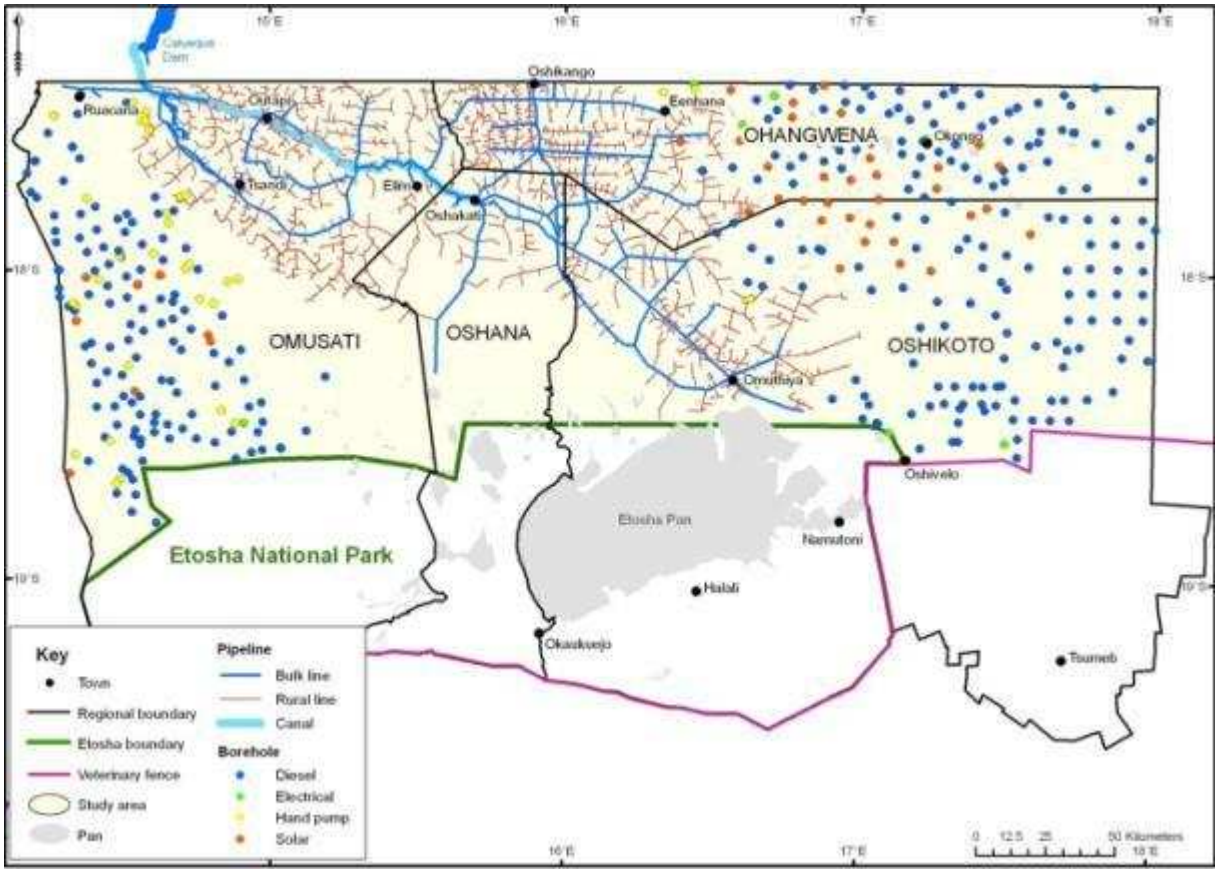
The Central Area of Namibia is illustrated in the schematic **Figure 2.2**below.

**Figure 2.2: Schematic Layout of the Bulk Water Supply Infrastructure in the CAN**



The current bulk water supply infrastructure in Cuvelai area is illustrated in Figure 2.3 below.

**Figure 2.3: Layout of the Bulk Water Supply Infrastructure in the Cuvelai Area**




## 2.4 OBJECTIVE OF THE STUDY

The objective of this study is to find a long-term solution to secure reliable water supplies for the CAN at least, and as far as possible also for the Cuvelai area. This involves a careful examination of all potentially feasible options and combinations of options to augment the water supply to the CAN and the Cuvelai areas of Namibia.

The projected water demand in the study area will first be determined up to 2050. This will be compared to the availability of water from existing sources. The expected water shortfall will thus be established. Realistic water supply options to alleviate these shortfalls will then be identified. These options (including combinations of options and possible hybrids) will be tested against delivery of required water security, engineering feasibility, economic efficiency, environmental sustainability and social acceptability. The strengths and weaknesses of the various options will be assessed, leading to a determination of the most favourable options.

The Cuvelai Area is dependent on a single source, namely the Calueque Dam and the associated transfer scheme, which is located in Angola. This is of concern to Namibia. An alternative (back-up) source is therefore required for this area.

## 2.5 CLIENT LIAISON

The MAWF is the principal Client for this Study. Specifically, the Consultant shall report to the Director in the Directorate of Resources Management in the MAWF. In terms of technical matters and progress, the Consultant will liaise with the Project Steering Committee (**PSC**) which consists of representatives from the MAWF, NamWater and the CoW.

The Environmental and Social team will work and report independent of the Engineering team. However, the two teams will closely synchronise their work for optimal efficiency.

## 2.6 UNDERLYING APPROACH TO THE PRE-FEASIBILITY STUDY

The required approach for the Pre-Feasibility Study is mainly that of a desk study. It will use existing information from all sources, and in particular that from previous studies. This information will be reviewed, interpreted in light of current information and, where necessary, updated to produce a relevant pre-feasibility investigation and outcome. Only minimal field work will be undertaken where necessary as more detailed investigations will be part of the design of a later, detailed feasibility phase, should the decision be made to proceed with the Project.

# CHAPTER 3 : PROJECT SCOPE AND ACTIVITIES

## 3.1 OVERALL PROJECT METHODOLOGY

The Environmental and Social component of this pre-feasibility study is, in the first few stages, largely responsive to the findings of the Engineering component. Thereafter both teams work in parallel, but in close synergy in terms of timing, sharing of information, assessing strengths and weaknesses, public participation and in preparing reports and cost estimates for a possible full feasibility study. The steps in the process are outlined in the table below and expanded in the text thereafter.

| Step | Engineering | Environmental / Social |
|---|---|---|
| 1 | Inception Report, agreement with Client. | Inception Report, agreement with Client. |
| 2 | Project launch | Project launch: Press conference / press release.<br>Formal notification to DEA and OKACOM.<br>Establishment of project website. |
| 3 | Determine time-based water needs in CAN &Cuvelai and thus shortfalls. | Review population demographic projections wrt water needs and then review the findings of water needs and shortfalls of Engineering Team. |
| 4 | Identify technical options to address shortfalls. | Work with Engineering Team to help ensure all options are on table. |
| 5 | Critically analyse technical options, including combinations and hybrids. | Work with Engineering Team to ensure full understanding of issues and to start flagging environmental and social issues.<br>Hold 1st Public Participation meeting to (a) present rationale for project to IAPs, (b) explain water needs, (c) discuss potential options and (d) list initial potential environmental impacts and issues (including social issues). |
| 6 | Based on above, determine preferred technical option(s). | Work with Engineering Team to ensure full understanding of all options (and combinations or hybrids) and their potential implications and issues, and develop a matrix specific to the preferred options. |
| 7 | Analyse and synthesise technical and environmental information and develop an integrated preferred option or options.<br>Hold 2nd Public Participation meeting to (a) remind IAPs / stakeholders of the rationale of the project and the approach, (b) the options identified, (c) the preferred options and why, (d) the environmental (including social) issues identified and (e) invite participants to give their input. | |
| 8 | Work input from PP meeting into Engineering Report and finalise the Pre-Feasibility Report. | Work input from PP meeting into environmental "Scoping" Report and finalise the Pre-Feasibility Report. |
| 9 | Prepare cost estimate for a possible Detailed Feasibility Study / Detailed Design Phase to follow. | Prepare cost estimate for a possible Detailed Feasibility Study Phase to follow. |

Note: IAP = Interested and Affected Parties

### 3.1.1 Step 1: Finalisation of Inception Report

This will be done based on feedback from the PSC and client.

### 3.1.2 Step 2: Project launch and associated activities

It is recommended that the Pre-feasibility Study be formally launched with a press conference and a press release, highlighting the need for the study, explaining the objectives and desired outcomes, introducing the teams and informing people about the planned public participation meetings.

It is also recommended that an interactive website be established for the Study by the Environmental and Social component for the project, on which public information is posted and through which interested and affected parties and all stakeholders can interact and communicate with the teams, the PSC and the client. Results of public meetings and issues raised will also be circulated on the website, to which IAPs can contribute.

This is the stage at which the Office of the Environmental Commissioner and the Department of Environmental Affairs (DEA) in the Ministry of Environment and Tourism (MET) will be officially notified of the Study. This is also the time at which the OKACOM Secretariat should ensure that all OKACOM Commissioners and basin States are aware of the Study.

### 3.1.3 Step 3: Determine time-based water needs and shortfalls

The main body of work for this step falls to the Engineering component of the Study. The Social sub-component of the Environmental team will work with the Engineering component to ensure that the best available data and methodologies are used for human population estimates and projected population change over the envisaged period to 2050 covered by the Report.

The Environmental and Social team will then engage with the Engineering team to fully comprehend the findings and understand their implications.

### 3.1.4 Step 4: Identify realistic technical options to meet water needs

Again, this work will be carried out by the Engineering component. Several master plans and similar studies have recently been completed, which have a direct bearing on the proposed feasibility study into the augmentation of water supply to the CAN and the Cuvelai. This means that a substantial amount of recent work has been done which can form the foundation of the pre-feasibility investigation into supply augmentation. These reports are as follows:

- Feasibility Study on the Okavango River to Grootfontein Link of The Eastern National Water Carrier (1997),
- Tsumeb Groundwater Study (April 2002),
- The Regional Rural Water Supply Development Plan for the Kavango Region (2003),
- Feasibility Study on Water Augmentation to the Central Area of Namibia (2004),
- The Central North Water Supply Area Master Plan (September 2009),
- The North East Water Supply Area Master Plan (July 2010),

- The Development of an Integrated Water Resources Management Plan; Theme 3: Formulation of Water Demand Management Strategy (August 2010),
- The Combined Regional Rural Water Supply Development Plan for the Oshikoto, Ohangwena, Oshana and Omusati Regions (November 2011),
- The Central Water Supply Area Master Plan (September 2011).

The Engineering team have identified many of the more realistic options for water augmentation to the CAN, which include one or more (possibly a combination of) of the following:

1. The Tsumeb Aquifer,
2. Development of the Kalahari Aquifer between Grootfontein and Rundu. Very little is known about this aquifer at this time, beyond its possible potential use for water supply and perhaps artificial recharge. More extensive exploration drilling will in all likelihood therefore be required to determine the abstraction potential (storage volumes seem to be very high) of this aquifer and the feasibility for abstraction and artificial recharge in the long term,
3. Use of water from the Hardap, Oanob and Friedenau Dams to keep the Windhoek Aquifer full,
4. Potential abstraction from the Rehoboth aquifer,
5. Development of the Otjiwarongo Marble Aquifers,
6. Potential abstraction from the Omaruru Aquifer. Details regarding the potential yield of this aquifer will need to be obtained from the MAWF,
7. Potential utilisation of the Otjivero Dam as a possible source for the Eastern Otjozondjupa and Omaheke Regions with regard to determining the water demands for these areas,
8. Further development of the Windhoek Aquifer and the WMARS project including increasing the capacity of the “water bank” towards the west,
9. Additional use of direct reclamation as a result of the upgrades to the Gammams Waste Water Treatment Plant currently under investigation by the CoW. If the capacity of the Gammams Plant is to be extended, the capacity of the New Goreangab Water Reclamation Plant could be extended, or alternatively, a new plant could be constructed to treat additional volumes of reclaimed water based on advanced reclamation with a membrane system (ultra pure water),
10. Extensions to the dual pipe system in the Windhoek municipal area following the completion of upgrades performed at the Old Goreangab Water Reclamation Plant in 2010-11 and the proposed new Ujams Water Treatment Plant (construction commenced in the first third of 2013),
11. Water reclamation in other towns (advanced reclamation) in the CAN which use more than 1 $Mm^3$/a of water,
12. Completion of *Kavango Link* – i.e. linking the start of the ENWC canal at Grootfontein to the Okavango River either at Rundu or elsewhere.

The options regarding potential additional water sources for the Cuvelai area appear to be somewhat limited. These include:

1. Abstracting water from the Kunene River on Namibian soil below the Ruacana Falls, which although still utilising water from the same source as currently, has the advantage of locating the abstraction and transfer infrastructure entirely on Namibian soil,
2. Development of the deep Ohangwena Aquifer in the area around Eenhana. Very little is known about this aquifer at this time, beyond its possible potential use for water supply and perhaps artificial recharge. More extensive exploration drilling will in all likelihood therefore be required to determine the capacity of this aquifer and the feasibility for abstraction and artificial recharge in the long term,
3. Water reclamation and re-use in the central nucleus of Oshakati, Ongwediva and Ondangwa, which could include direct reclamation or partial re-use of “grey” water for irrigation purposes,
4. Development of the ground water sources to the east and west of the central pipeline network. This could include linking up the existing individual borehole installations for supply to the central Cuvelai area or developing new well fields for this purpose,
5. The desalination of saline ground water in the central portions and possible in remote parts of the Cuvelai area,
6. Use of Lake Oponono,
7. The abstraction of water from the Okavango River.

The Environmental and Social team will engage with the Engineering team to help ensure that all viable options are being considered, and to understand the full implications of the engineering options being considered.

### 3.1.5 Step 5: Critically analyse technical options

The Environmental & Social team will take each option and systematically subject it to a SWOT analysis. The team will identify all the environmental and social strengths and weaknesses of each option, look at how the weaknesses and impacts could be mitigated and ensure that there are no critical factors that would eliminate an option from further consideration. This work will be done individually by the specialists, and then brought together for discussion and in a small workshop. The results from this analysis will be presented in a detailed matrix with supporting documentation.

At the end of this process, the first one-day public consultation meeting will be held. This will be an open meeting for all IAPs and stakeholders and thus will be advertised in the local media. A stakeholder list will also be prepared and specific invitations will be distributed via e-mail. This meeting will be held sequentially at three different venues, in Windhoek for the CAN IAPs, in Oshakati for the Cuvelai IAPs and in Rundu for IAPs with interest in the potential Okavango link.

The public meet would ideally be structured as follows:

- The Client (a) explains briefly the need for the study, (b) introduces the Steering Committee reps, the Engineering team reps; the Environmental & Social Team reps, and SAIEA,(c) explains the independence of the two teams and SAIEA, and (d) explain the process, namely that this is a pre-feasibility study, essentially desk-top, looking at water

demand, water shortfall, engineering options to meet the shortfall, potential environmental & social impacts, and then narrowing down to one or a few preferred options which will be investigated in more detail. The full EIA will come into the next phase when the full feasibility study might be undertaken;

- The Engineering team presents their findings on water needs to 2050, and the shortfalls that will be experienced based on current sources;
- The Engineering team presents their findings on what realistic options are available to meet the shortfall;
- The Environmental & Social team present their findings on the preliminary environmental and social impacts, and ways that these could be mitigated.
- This is followed by a facilitated plenary session where IAPs are asked to consider:
    - The demand and shortfall situation and give their views and ideas,
    - The engineering options on the table to augment water supply and whether there are any other realistic and feasible options that have been overlooked,
    - The environmental and social impacts identified for each option, whether these cover the issues of concern to all stakeholders and to provide any other issues, and
    - Any other points that the IAP and any stakeholder wishes to raise.
- The meeting is concluded with “next steps” explained to the participants.

The presentations and the Minutes of the facilitated discussion held at each venue will be placed on the Study website for easy access by both participants as well as all other IAP. The website will invite further contributions from stakeholders on an ongoing basis.

### 3.1.6 Step 6: Identify preferred options

During this component of the Study the Engineers will identify the preferred options, based on meeting the water needs, and more detailed engineering and cost considerations. The Environmental and Social Team will work closely with the Engineering team to integrate the environmental and social considerations into the overall assessment process.

The final selection of the preferred water supply option(s) or alternative(s) for the CAN and Cuvelai areas will be based on an assessment of the following factors:

1. The financially most favourable alternative based on the lowest DPC,
2. The lower risk-favourable alternatives,
3. The environmentally and socially most favourable alternative on the basis of the preliminary environmental assessments conducted and lowest environmental costs,
4. Other consideration such as:
    - Which alternatives provide the best long-term water security to consumers,
    - Which alternatives provide the best wider economic benefit to Namibia,
    - Which alternatives can be implemented the easiest and in the shortest space of time,
    - Other considerations which may become evident during the course of the Study.

The preferred option or options (maximum of three) could consist of stand-alone solutions, or more likely, solutions based on a combination of options. It is also likely that the preferred option(s) for the CAN and Cuvelai areas will be based on a compromise or trade-off between the above mentioned factors and considerations in order to arrive at the overall optimum solution.

### 3.1.7 Step 7: Analyse information on the options (e.g. strengths / weaknesses) and derive an integrated preferred option of options

Once the details of the preferred option or options have been established by the Engineering team (and to save time the teams will share information as information becomes available where possible), the Environmental and Social Team will carry our more detailed assessments of the environmental and social aspects. While this is essentially a desk-top study, some reconnaissance field visits may be necessary, depending on the preferred options that emerge.

At the end of this process, the second one-day public consultative meeting will be held. Again, this will be an open meeting for all IAPs and stakeholders, announced in the local media and by means of e-mail invitations. It is envisaged that the meetings will be held at the same three venues as the first meeting.

This public meeting would be structured as follows:

- The Client (a) explains briefly the background and the stage reached in the Study, (b) introduces the Steering Committee reps, the Engineering team reps; the Environmental & Social Team reps, and SAIEA, and (c) explain the process.
- The Engineering team briefly recaps their findings on water needs to 2050, the shortfalls that will be experienced based on current sources and the full list of realistic options that were considered;
- The Engineering team then describes how they assessed these options to arrive at one, two or three preferred options or combinations of options.
- The Environmental & Social team present their findings on their assessment of the environmental and social impacts, their implications and ways that they could be mitigated.
- This is followed by a facilitated plenary session where IAPs are asked to consider:
    - The process used to derive the preferred option(s),
    - Their views on the option(s) selected,
    - The environmental and social impacts identified and their implications.
    - Any other points that the IAP and any stakeholder wishes to raise.
- A brief assessment by SAIEA on the process that has been followed to date and any shortfalls in terms of due process and good EA practice,
- The formal meeting concludes with an explanation of “next steps”.
- After the formal meeting, all three components of the Study, namely the Engineering team, the Environmental & Social team and SAIEA will make themselves available, with their information prepared on posters, for more detailed discussions on a one-to-one basis with IAPs who might require more detail, explanation or discussion time.

The outcomes from the meetings will be placed on the website and remain open for further contributions from stakeholders and IAPs.

### 3.1.8 Step 8: Prepare draft Pre-feasibility Study Report and Scoping Report

The results of the work carried out in steps 3-7 will be documented in a concise Environmnetal and Social Pre-feasibility Report which will present the process, will integrate the relevant input from the public consultations, explain the environmental and social issues pertinent to the full set of engineering options, and expand on these for the preferred option(s) selected.

A Scoping Report will be prepared for the preferred option(s) identified. A Table of Contents (ToC) will be drafted and presented to the PSC and the Client for approval.

### 3.1.9 Step 9: Prepare cost estimate for possible Feasibility Study phase

A detailed cost estimate will be prepared for a possible full feasibility study, based on the Scoping Report for the preferred option(s).

## 3.2 POLICY AND LEGISLATIVE ENVIRONMENT

In addition to the water policies and legislation referred to in the Engineering Inception Report, the proposed pre-feasibility study will need to consider the following environmental legislation:

- Environmental Management Act No. 7 of 2007
- List of activities that may not be undertaken without Environmental Clearance Certificate: Environmental Management Act, 2007, Government Gazette No. 4878, 6 February 2012
- Environmental Impact Assessment Regulations: Environmental Management Act, 2007,Government Gazette No. 4878, 6 February 2012

The following agreements are also pertinent:

- The 1997 United Nations Convention on shared watercourses
- The Revised (1995) SADC Protocol on Shared Watercourses

Both the Okavango and Kunene Rivers have basin committees comprising formally appointed representatives from each of the basin states, known respectively as:

- The Permanent Okavango River Basin Water Commission (OKACOM) and
- The Permanent Joint Technical Commission for the Kunene River (PJTC).

On the Okavango, each of the three basin states have also establish national Okavango Basin Management Committees.

In Botswana the entire Okavango Delta has been declared a Ramsar site, i.e. a wetland of international importance under the UN Ramsar Convention. Namibia is currently seeking to list the lower Okavango in the Mahango core area of the Bwabwata National Park as a Ramsar site. The Botswana Government is currently motivating for the Okavango Delta to be declared a World Heritage Site under UNESCO.

## 3.3 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS AND LIAISON

### 3.3.1 Separate Engineering and Environmental / Social Teams

Two separate teams have been appointed to undertake this Study, an Engineering team and an Environmental & Social team. The Environmental & Social Team will function independently from the Engineering team, as the separation of the technical and environmental assessments is one of the key requirements of the Equator Principles. However, both teams will work closely together to share information and ensure that optimum efficiency is achieved.

### 3.3.2 Functioning of the Environmental Team

With regard to the functioning and responsibilities of the Environmental & Social Team, the following has been agreed upon with the MAWF:

1. The Environmental& Social Team will function independently from the Engineering Team, though there will be liaison and information sharing between the two teams,
2. The Environmental& Social Team will report to and receive instructions from the PSC,
3. The PSC will approve payments to the Environmental& Social Team,
4. The Environmental& Social Team will prepare an Inception Report, similar to the Inception Report prepared by the Engineering Team, for simultaneous submission along with this document for approval to the MAWF. This document will include a methodology statement, programme and cost estimate,

As noted earlier, the Environmental Team in fact consists of two teams, the first being the team of specialists that will conduct the EIA (the EIA consultants), and the second, much smaller team from the Southern African Institute for Environmental Assessment, that will provide an independent, external review of the EIA process and the EIA products.

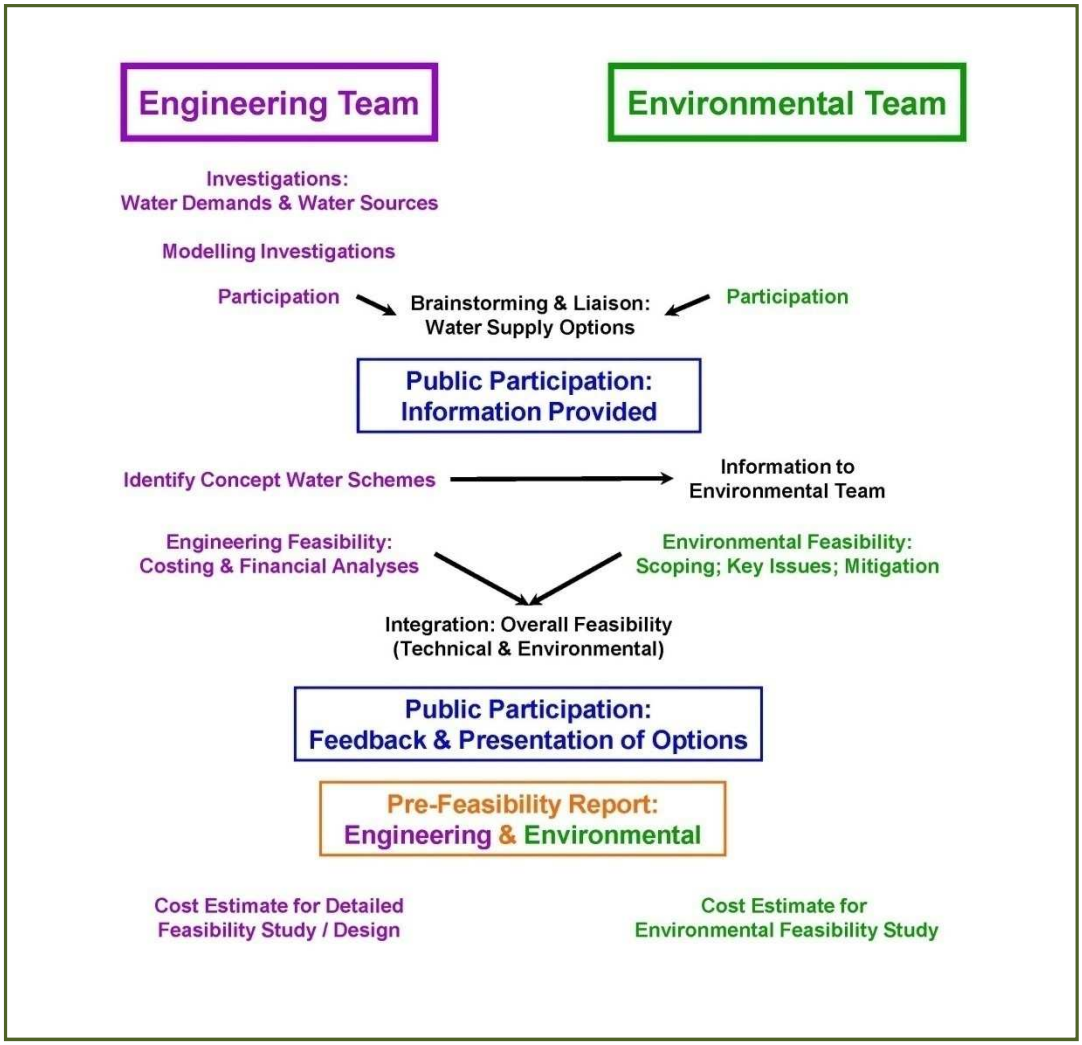
### 3.3.3 Liaison between the Engineering and Environmental / Social Consultancy Teams

The Engineering and Environmental & Social Consultancy Teams will liaise and share information on an on-going basis, addressing queries / uncertainties as they arise. However, liaison will be more formal at certain key milestones during the course of the Study as follows:

1. Identification of technical options to address water supply shortfalls,
2. Conducting the 1st Public Participation Meeting,
3. Analysis and combination of the preferred engineering and environmental / social options,
4. Conducting the 2nd Public Participation Meeting,
5. Preparation of reports and costings.

A representation of the liaison between the Engineering and Environmental & Social Consultancy Teams is shown in **Figure 3.1** below.

**Figure 3.1: Liaison between the Engineering and Environmental / Social Consultancy Teams**




### *3.3.3.1 Identification of Water Supply Options*

The two teams will formally liaise when the basic water supply options to meet the identified shortfalls for the CAN and the Cuvelai are drawn up. This will take the form of a round-table joint consultative session between senior members of the two consultancy teams.

The main purpose behind this liaison will be to ensure that the engineering / technical alternatives put forward by the Engineering Consultancy Team are in principle acceptable in terms of environmental and social concerns. This will aim to avoid the situation where time and effort is spent in subsequent phases of the Study (preliminary design, costing, financial analyses) examining an alternative which is immediately disqualifiable in terms of the possible environmental and social impacts.

A further benefit of this liaison will be ensuring that both consultancy teams are informed regarding the possible advantages and disadvantages of the various alternatives to be examined separately by the two teams. This is believed to be beneficial to the cohesion of Project with regard to the 1st Public Participation Meeting which will be held following the formulation of the water supply options.

#### *3.3.3.2 Analysis and Combination of the Preferred Engineering and Environmental / Social Options*

Following the identification of the water supply (augmentation and / or back-up) alternatives, and the 1st Public Participation Meeting and the feedback received thereon, the Engineering Consultancy Team will conduct technical and financial analyses of the three options for each of the CAN and the Cuvelai to determine the technically most favourable alternatives. Similarly, the Environmental / Social Consultancy Team will conduct evaluations of the possible environmental and social impacts of the different options, including mitigation measures, and determine the most favourable alternatives.

The engineering (technical and financial) and environmental / social evaluations will need to be combined in order to derive the overall most favourable alternatives. These two separate evaluations will be discussed and combined during a round-table joint consultative session between senior members of the two consultancy teams.

A further benefit of this liaison will be ensuring that both consultancy teams are informed regarding the considerations behind the separate evaluations of the water supply alternatives and the factors weighed and the considerations behind the combination of these separate evaluations and the formulation of the overall most favourable water supply alternatives. This is believed to be beneficial to the cohesion of Project with regard to the 2nd Public Participation Meeting which will be held following the formulation of the water supply options.

#### *3.3.3.3 Preparation of Reports and Costings*

Senior representatives of the two teams will meet after the second public meeting to plan the preparation of the Pre-feasibility Reports, the Scoping Report and the Cost Estimate for a full Feasibility Study to ensure that a consistent approach is applied.

## 3.4 PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATION

### 3.4.1 Public Participation

Public participation and an awareness campaign will form a vital component of the Study. In accordance with the Environmental Management Act, 2007, the public participation and the involvement of Interested and Affected Parties (**IAP**s) will be driven by the Environmental & Social Consultancy Team (see Section 3.1, Steps 5 & 7). The Engineering Team will however be involved with both the 1st and 2nd Public Participation Meetings in order to provide information on the engineering evaluations conducted and answer any questions in this sphere of the Project. Both sets of meetings will be conducted in Windhoek (to address the CAN component of the Study), Oshakati (to address the Cuvelai component of the Study) and Rundu (to address the Okavango Link component of the Study).

It is assumed that for the Pre-Feasibility Study, only Namibian IAPs need to be engaged and therefore that meetings in Maun or elsewhere to engage Angola and Botswana will not be required. The Consultant has assumed that OKACOM will be kept informed of the Project via

the official channels through the MAWF. If OKACOM wishes to attend these meetings, then they would do so at their cost.

#### *3.4.1.1 1st Public Participation Meeting*

The 1st Public Participation Meeting will be held following the formulation of the water supply options and concept schemes, which will be done as a joint exercise between the Engineering and Environmental & Social Consultancy Teams.

The purpose of this 1st Public Participation Meeting will be to:

- Present the rationale for the project to IAPs,
- Explain the water needs,
- Discuss the potential water supply / augmentation / back—up options,
- List the initial potential environmental impacts and issues (including social issues), and
- Invite participants to share their thoughts and give their input.

#### *3.4.1.2 2nd Public Participation Meeting*

The 2nd Public Participation Meeting will be held following the combination of the technical and financial analyses performed by the Engineering Consultancy Team and the evaluations of the possible environmental and social impacts of the different options, including mitigation measures, performed by the Environmental / Social Consultancy Team and the formulation of the overall most favourable alternatives. This meeting will also be conducted as a joint exercise between the Engineering and Environmental / Social Consultancy Teams.

The purpose of this 2nd Public Participation Meeting will be to:

- Remind IAPs / stakeholders of the rationale for the Project and the approach followed,
- The options identified,
- The preferred options and why,
- The environmental (including social) issues identified and
- To invite participants to give their input.

### 3.4.2 Stakeholder Consultation

A comprehensive list of stakeholders will be prepared, in consultation with the Engineering team, the PSC and the Client. In addition, information will be provided on the Study website, which will be widely publicised, and invitations to public meetings and to communicate via the website will be publicised in the media. The Basin Management Committee members will also be invited to participate as stakeholders. A preliminary list of stakeholders is as follows

- OKACOM,
- PJTC
- NamPower,
- NORED,
- CENORED and possibly ERONGORED,

- Namibian Chamber of Commerce and Industry,
- Regional Councils (Omusati, Oshana, Ohangwena, Oshikoto, Kavango, Otjozondjupa, Omaheke, Khomas, Erongo),
- City of Windhoek,
- The relevant town councils (Rundu, Grootfontein, Otjiwarongo, Okakarara, Okahandja, Karibib, Omaruru, as well as the larger centres of Oshakati, Ondangwa and Ongwediva in the Cuvelai),
- Ministry of Regional, Local Government, Housing and Rural Development,
- Ministry of Environment and Tourism,
- Ministry of Mines and Energy,
- Department of Agriculture,
- Large consumers,
- Basin Management Committees (the Cuvelai, Okavango and Omaruru Committees).

These stakeholders and any other parties which register as IAPs will be specifically invited to the two public participation meetings.

### 3.4.3 Information Sharing with the Permanent Okavango River Basin Water Commission

The Environmental & Social team will discuss with the PSC and Client how the OKACOM Secretariat and member states in the Okavango Basin should be kept informed and up to date with the progress and various components of this Pre-Feasibility Study via the official channels, and what role the consultants should play in assisting ensure that good communications and transparency is achieved and maintained.

# CHAPTER 4 : LIAISON AND REPORTING

## 4.1 LIAISON WITH THE PROJECT STEERING COMMITTEE

The Environmental & Social team shall report to and liaise with the PSC regarding the progress of the Project, the project deliverables (reports), arrangements for presentations (report discussions), public consultations and other important administrative and technical aspects of the Project.

### 4.1.1 Team Leader for the Environmental & Social Team

The Team Leader will, among others, be responsible for correspondence and coordination between the PSC and the Team.

### 4.1.2 Monthly Progress Meetings with the Project Steering Committee

It is proposes that monthly Progress Meetings be held with the PSC in order to keep the PSC updated on the progress made, discuss any technical matters or hitches experienced in the execution of the project tasks and activities and to obtain clarity or decisions from the PSC on any matters where this may be required.

The Monthly Progress Meetings with the PSC be held as a combined meeting with the Engineering *and* Environmental & Social Consultancy Teams, where the latter team will attend as and when appropriate (depending on the stage of work). The advantages of this are twofold; firstly, this is the best way to ensure that all parties are kept up to date and informed on all important aspects of the Project, and secondly, it is more efficient, especially for the PSC members.

## 4.2 PROJECT REPORTING

### 4.2.1 Project Phases and Milestones

The Environmental & Social component of this study is agreed to the three phases proposed by the Engineering team (Table 4.1) and shall align its reporting likewise, as follows:

1. Phase 1: Investigations and Water Demands (this will be a very brief report);
2. Phase 2: Modelling and Concept Schemes, with initial environmental screening and the results of the 1$^{st}$ public participation meeting; and
3. Phase 3: Engineering and Environmental Evaluations with results of 2$^{nd}$ public participation meeting.

### 4.2.2 Interim Reports and Report Discussions

It is proposed that the Interim Reports to conclude Phase 1 and Phase 2 of the Project and the Draft Report to conclude Phase 3 of the Project be submitted to the PSC in electronic format only (as an integrated PDF document). The PSC may wish to distribute these reports to other interested stakeholders (for example the Regional Councils, OKACOM, etc). Hardcopies of these reports can be made available at a nominal cost per copy.

It is further proposes that following a two-week evaluation period, a Report Discussion occasion be scheduled for each of the Interim and Draft Reports. This occasion should consist of a brief presentation of the Interim or Draft Report as the case may be (delivered by the Consultants), following which a short discussion of the relevant report can be held and approval gained from the PSC.

**Table 4.1: Project Phases, Milestones and Approval**

| Project Phase | Key Activities | Key Outcomes | Milestone | Approval Required by the PSC |
|---|---|---|---|---|
| **Phase 1** (covers steps 2-4) | Establishment of water supply areas (CAN, Cuvelai and other). Investigations and determination of water demands. Establishing the capacity of existing and potential water sources. | (1) Water demand forecasts<br>(2) Yield of existing and potential water sources | Interim Report and Report Discussion | (1) Water demand forecasts<br>(2) Yield of existing and potential water sources |
| **Phase 2** (covers step 5) | Modelling and investigations and the development of concept schemes | (1) Configuration of the proposed concept schemes<br>(2) Preliminary assessment of environmental & social impacts<br>(3) 1st Public meeting | Progress Meeting prior to 1st Public Participation Meeting | (1) Configuration of the proposed concept schemes |
| | | | Interim Report and Report Discussion | (1) Configuration of the proposed concept schemes<br>(2) Environmental & social assessment matrix |
| **Phase 3** (covers steps 6-9) | Technical feasibility (costing, financial analyses), environmental feasibility and hence overall feasibility. | (1) Technical feasibility<br>(2) Environmental & social feasibility<br>(3) Overall feasibility<br>(4) 2nd Public meeting | Progress Meeting prior to 2nd Public Participation Meeting | (1) Overall favoured water supply alternatives<br>(2) Environmental & Social impacts |
| | | | Draft Report, Report Discussion and then Final Report | Pre-Feasibility Study |

### 4.2.3 Draft and Final Reports

In a manner similar to that proposed with the two Interim Reports, it is proposes that a Draft Report for the Project be submitted to the PSC in electronic format only (as an integrated PDF document). The PSC may wish to distribute these reports to other interested stakeholders (for example the Regional Councils, OKACOM, etc).

The process of an evaluation period, Report Discussion occasion (presentation and short discussion) should be the same for the Draft Report as with the two Interim Reports. The only difference being that the comments made at the Report Discussion of the Draft Report will be

incorporated into the Final Report which will be submitted shortly after the Report Discussion to mark the conclusion of the Pre-Feasibility Study.

The Report Discussion proceedings would include representatives from both the Engineering and Environmental& Social Consultancy Teams and the presentation (as with the Draft Report) should combine the engineering and environmental aspects of the Pre-Feasibility Study. In addition, the external reviewer (SAIEA) should be present to give a brief assessment of due process and whether good practice standards have been met.

It is proposes that the Final Report for the Pre-Feasibility Study be submitted to the PSC in electronic format (as an integrated PDF document) and that three, bound, hard copy reports, be submitted to the MAWF to mark the conclusion of the Pre-Feasibility Study.

# CHAPTER 5 : PROGRAMME AND STRUCTURE OF THE CONSULTANCY TEAM

## 5.1 PROPOSED PROGRAMME

A proposed implementation programme is given in **Appendix A**, for undertaking the tasks as set out in this Inception Report. This programme should be seen as indicative, because the Environmental and Social component of this study will largely respond to the findings of the Engineering team, particularly in steps 3-5.

## 5.2 STRUCTURE OF THE PROJECT TEAM: SENIOR AND KEY PERSONNEL

As this is predominantly a desk study, a team of senior specialists has been assembled with extensive knowledge of the areas, issues, challenges and approaches that should be applied. The key personnel in the Consultancy Team are those listed in **Table 5.1** below.

Because the Environmental and Social team has to await the findings of the Engineering team, it could conceivably arise that some expertise is required that is not contained within the Environmental and Social team. If this were to happen, the team leader will raise this with the client and agree a way forward.

The underlying principle of the staffing proposal is to provide the number of specialists and suitably experienced personnel required in the various disciplines, in order to adequately address the complexity of the analyses to be performed and to provide a high standard and quality of service to the PSC.

**Table 5.1: The Environmental & Social Consultancy Team: Senior and Key Personnel**

| Title / Main Function | Name | Company |
|---|---|---|
| Overall Team Leader and environmental component | Dr CJ Brown | Sustainable Solutions Trust (SST) |
| Deputy Team leader and social component | Ms A Ashby | Ashby Associates cc |
| Fresh water and river basin specialist | Dr J King | University of Cape Town |
| Botanical specialist | Mrs C Mannheimer | National Botanical Research Institute (associate) |
| Land use, processes, issues and relationships between people and their environment, mapping and GIS | Dr JM Mendelsohn | Research & information Services of Namibia (RAISON) |
| Environmental legislation and policies, land and water issues | Mr U Nakamhela | Nakamhela Attorneys |
| Environmental economics, cost-benefit | Dr J Barnes | Design and Development Services |

The second element of the Environmental Assessment is that of the external review and evaluation team provided by the Southern African Institute for Environmental Assessment (SAIEA). The key personnel in the SAEIA Team are listed in **Table 5.2**.

## Table 5.2: The External Review Team: Senior and Key Personnel

| Title / Main Function | Name | Company |
|---|---|---|
| Team Leader of Review process | Dr P Tarr | Southern African Institute for Environmental Assessment (SAIEA) |
| Co-reviewer | Ms B. Walmsley | Southern African Institute for Environmental Assessment (SAIEA) |

# APPENDIX A

## PROPOSED TASK MATRIX

# APPENDIX B

## PROPOSED IMPLEMENTATION PROGRAMME