PROJECT PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT INFORMATION

Project Category:	Regular
Country:	Namibia
Title of Project:	Pilot rural desalination plants using renewable power and membrane technology
Type of Implementing Entity:	National Implementing Entity (NIE)
Implementing Entity:	Desert Research Foundation of Namibia (DRFN)
Executing Entity:	Namibia Water Corporation Limited (NamWater)
Amount of Financing Requested:	USD 4,999,386

Executive summary

Namibia relies heavily on groundwater for the supply of water, and the predicted increase in both temperature and rainfall variability due to climate change will increase this reliance. However, in many areas the dissolved solids content of the locally available groundwater exceeds the approved threshold for human consumption. Decreased aquifer recharge due to periods of lower rainfall caused by climate change is likely to cause an increase in total dissolved solids in groundwater, which will exacerbate the water quality situation.

Pumping water over long distances from other water sources is not a feasible option for supplying small communities with good quality water. An alternative is to improve the quality of locally abstracted groundwater by applying treatment techniques. These techniques require energy in the form of electricity, but many of the small communities are not coupled to the national electricity grid. It is also considered that the energy needs for treatment should be met by sustainable and environmentally sound resources.

The aim of the proposed project is thus to pilot the treatment by reverse osmosis (RO) of poor quality local groundwater to a level that complies with the national standards for drinking water, using sun and wind energy to power the process. Execution of the project will yield a wide range of information and knowledge on both technical and social aspects of establishing and operating such treatment and power plants. The acquired information, knowledge and skills will then be communicated to stakeholders in the water supply sector in order that the applied technology could be mainstreamed and replicated elsewhere in the country.

The project will result in improved resilience of vulnerable communities and groups to climate change impact, specifically to a decrease in chemical water quality of existing groundwater sources. In addition to providing benefits to vulnerable communities in the target areas, the project will also serve to increase the capacity of government agencies to integrate climate change adaptation considerations into water supply planning and policy processes.

It is considered essential to pilot two plants in a rural setting, where the water demand of the communities differs by an order of magnitude. This would allow the opportunity to establish how plant size affected aspects such as operation, management and maintenance requirements, the unit cost of water produced, the involvement of beneficiaries; and the interest of stakeholders. The two selected project sites are at Grünau settlement and at Bethanie village, both located in the far south of the country.

Abbreviations and acronyms

AF	Adaptation Fund
CAPEX	Capital expenditure
CRSES	Centre for Renewable and Sustainable Energy Studies, Stellenbosch University
DA	Designated Authority
DEA	Directorate of Environmental Affairs
DRFN	Desert Research Foundation of Namibia
DWA	Department of Water Affairs
EE	Executing Entity
EIF	Environmental Investment Fund
EIA	Environmental Impact Assessment
EMA	Environmental Management Act, 2007
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESG	Environmental social and gender
GRN	Government of the Republic of Namibia
IWRM	Integrated Water Resource Management
IWRMP	Integrated Water Resource Management Plan
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
NCCP	National Climate Change Policy
NIE	National Implementing Entity
MoF	Ministry of Finance
NCCP	National Climate Change Policy
NDP	National Development Plan
NDP5	Fifth National Development Plan
NPCC	National Policy on Climate Change
NSA	Namibia Statistics Agency
NUST	Namibia University of Science and Technology

OPEX	Operational expenditure
PM	Project Manager
PSC	Project Steering Committee
PT	Project Team
RE	Renewable energy
RO	Reverse osmosis
SADC	Southern Africa Development Community
SDGs	Sustainable Development Goals
TDS	Total dissolved solids
UNFCCC	United Nations Framework Convention on Climate Change

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A. Project background and context

Namibia is located in the southern hemisphere, lying along the south-western region of Africa as is indicated in Figure 1 below.

Figure 1: Namibia's location on the African continent

According to the Namibia Statistics Agency (NSA) the country covers an area of some 825,418 km^2, has a sparse and scattered population of some 2 280 716 persons equating to approximately 2.7 people per square kilometre (NSA, 2016). Scattered populations over vast areas have many disadvantages naturally and the scattered populations of Namibia have an even greater disadvantage due to the country's climatic challenges.

1. Climate

1.1 Climatic background

Namibia's climate is governed by its location on the south-western side of the African continent in the Subtropical High-Pressure Zone between the Inter-Tropical Convergence Zone to the north and the Temperate Zone to the south (Mendelsohn, et al., 2009) The country experiences high climatic variability that causes frequent dry spells and sporadic flooding in river basins (MET, 2013).

The southward movement of the Inter-Tropical Convergence Zone during the Namibian summer initiates the rainfall season, normally starting in October and ending in April. In the far south, the Temperate Zone moves northwards during the Namibian winter, resulting in the winter rains which occur in the far southwest of the country. Small variations in the timing of these movements result in considerable differences in weather conditions from one year to the next.

Climatic variability is thus a common phenomenon in Namibia, with persistent droughts and unpredictable and variable rainfall and temperatures being the norm (Mfune & Ndomo, 2005), (Dirkx, et al., 2008).

1.2 Climate change

Over the long-term Namibia has already experienced a mean decadal temperature increase of 0.2ºC, estimated to be about three times the global mean (Reid et al., 2007).

It is predicted with a high degree of certainty that due to climate change Namibia can expect an increase in temperature and evapotranspiration at all localities, with the maximum increase (2 – 6ºC) in the interior (MET, 2015). Most global circulation models and the median of these models project that Namibia will become drier, rainfall variability is likely to increase, and extreme events such as droughts and floods are likely to become more intense (MET, 2013). Namibia's most recent National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) (ibid.) confirms that Namibia will be exposed to an increase in temperature and increased uncertainty in rainfall patterns.

Due to the climate, making a living off the land in Namibia is a challenge that varies only with where you live. As such, rural communities are particularly vulnerable. Poverty, unemployment and climate exacerbate the challenge (Dirkx, et al., 2008).

2. Gender

2.1 Gender inequality

Eradication of factors that contribute to gender inequality has remained a national priority since Namibia attained its independence in 1990. However, Namibian women are still lagging in many areas. The root factors that perpetuate gender inequality in Namibia are patriarchal attitudes, discriminatory laws, religious and cultural practices that undermine women's rights, and limited access to many economic sectors. These are further worsened by widespread gender based violence.

Despite the efforts of government to introduce laws that promote gender equality, some traditional communities have not fully adapted to the new legal and constitutional frameworks developed after Independence. Custom and "tradition" are often in conflict with the new political demands of gender equality and greater representation for women.

Women and youth are more vulnerable to climate change than other parts of the society, often due to existing social norms. The risk of climate change magnifies the relative poverty of women and youths. As such, women and the youth are agents of change, and are key players in water management and sustainable water practices.

Through the years, several indices have been developed to quantify the concept of gender inequality. The United Nations Development Programme uses the Gender Inequality Index (GII) and Gender Development Index (GDI). GII is a composite measure that shows inequality in achievement between women and men in reproductive health, empowerment and the labour market, while the GDI measures achievement in human development by men and women in three areas: health, education, and command over economic resources.

Namibia has a GII of 0.401 (2014) and ranks 81 out of 155 countries assessed. The GDI value (2014) was 0.981 which classified Namibia into Group 1 out of 5 groups in total. Group 1 comprises of countries with high equality in HDI achievements between men and women, using the absolute deviation of less than 2.5% (UNDP, 2015) This positions Namibia relatively positively in terms of gender equality on a global scale.

The Global Gender Gap Index (GGGI) of the World Economic Forum examines the gap between men and women in four categories: economic participation and opportunity, educational attainment, health and survival; and political empowerment (World Economic Forum, 2014). The results for Namibia in appear in Table 1 below. Namibia ranks at number 40 of 142, based on the GGGI, thus is considered relatively gender-equal.

Table 1: Gender Gap Index in Namibia in 2014

Description	Score*	Rank
Economic participation and opportunity	0.733	38
Educational attainment	1.00	1
Health and survival	0.980	1
Political empowerment	0.175	62
Gender Gap Index 2014	0.722	40

* Inequality = 0.00; Equality = 1.00.

The Organization for Economic Cooperation and Development (OECD) developed the Social Institutions and Gender Index (SIGI), a composite index that scores countries (from 0 to 1) on 14 indicators grouped into five sub-indices: discriminatory family code, restricted physical integrity, son bias, restricted resources and assets, and restricted civil liberties to measure the discrimination against women in social institutions across 160 countries. The 2014 SIGI value for Namibia is 0.1173, suggesting that discrimination against women is low (OECD, 2014)

Females in Namibia outnumber males in a ratio of 100 females to 94 males, making the rural environment for females very harsh. Added to this is the fact that 44% of female headed households live in poverty (NPC, 2017) Vulnerability of women and the youth to poverty also increases as it relates to natural disasters such as floods and droughts and to climate change induced impacts. Access to water and water availability might be also attributed to increased vulnerability of women and the youth. In the informal settlements, supply of potable water remains a challenge. Some strategies to support gender development are:

- Empowerment of women
- Freedom of women from gender-based violence
- Increased number of women in decision making
- Financial inclusion of women
- Mainstream informal women businesses into the formal sector
- Mainstream gender in all sector policies

2.2 Political participation and decision making

Since Independence in 1990, women' representation in decision making has significantly increased. According to the official statistics, there has been an increase of women seats in Local Authorities from 41.3% in 1998 to 43.4% in 2004. The 2005 Cabinet had 24 members, including 6 women, and resulting in 25% of woman's participation. In the regional council elections of December 2004, 12 seats out of 107 were filled by women, resulting in only 11% of women's representation. In the National Assembly on 2006, 27% of the total seats were occupied by women.

In terms of involvement and participation in the field of decision-making in other sectors, 46% of registered NGOs are led by women. Greater political participation and involvement in decision-making process is an important measure of women's empowerment. The Government of Namibia, as a signatory to the Southern African Development Community (SADC) Protocol on Gender and Development, has committed itself to achieving a target of 50% representation by 2015. A target has been set by the African Union (AU) to achieve 50% representation by 2020. Similarly, the Local Authority Act introduced gender quotas of at least 30% to increase the number of women in local government.

In addition, the Namibian National Gender Policy and National Gender Plan of Action have set further targets to be met by political parties to increase women's political participation. As a result, during the 2015 presidential and national elections the participation of women in politics increased up to 42% for women parliamentarians in the national assembly. In 2015 Namibia also appointed its first female Prime Minister as well as a female Deputy Prime Minister, also serving as a Minister of International Relations and Cooperation.

3. Economy

Despite Namibia being an upper-middle income country with a per capita GDP of USD 6,000.04 in 2015 (Trading Economics, 2015) and annual GDP growth being 3-4% over the last decade, wealth is very unequally spread. It has one of the highest income inequalities in the world, with a Gini coefficient of 0.57 (NPC, 2017). In 2015, about 18% of the population was classified as poor and 11% as extremely poor (ibid.), while 28.1% of the labour force was unemployed (ibid.). Poverty and unemployment are highest in rural areas. Rural unemployment was 30.2% in 2014, while 32.0% of women and 39.2% of the youth was unemployed (ibid.). The rural population is therefore highly vulnerable to climate change and needs support to adapt to a worsening climatic impact.

In any discussion on vulnerability the impact of HIV/AIDS cannot be neglected. Prevalence of HIV at 16.9% since 2014, adds to the problem (ibid.). The loss of people in the productive ages due to the pandemic has substantially decreased life expectancy and increased the number of dependents and orphans that households must support. This puts an additional strain on rural production and productivity, as well as on financial resources, people and support networks and thus increases the vulnerability of the rural population.

Rural economic development is vital since most farming and tourism activities take place in rural areas and 58% of the population live in rural area. Economic activity in rural areas remains low since most of the businesses are very small and mainly concentrated in wholesale, retail, accommodation and food services. The current unemployment rate of 28% nationally is even more exacerbated in rural areas, where 18% of the population live below the poverty line. (ibid.). Manufacturing in rural areas is hampered by constraints such as inadequate skills, poor access to markets and lack of access to financial resources. Thus, business activity in rural areas is limited to those sectors with low entry barriers.

Integrated planning both at the national and subnational level is crucial to improve access to services and trigger economic activities for the rural economy. Desired interventions re rural communities in the National Development Plan 5 (NDP5) include an increase in access to water.

NDP5 speaks directly to water and energy needs of the rural populace, noting that there will be an increase of water demand from 10 600 000 m^3 (2015) to some 10 900 000 m^3 by 2025. This will take place while water systems primarily for agriculture are already constrained and become more difficult to maintain. Electricity access fares even worse as rural household access is at 24% versus 75% in urban areas. The agriculture sector accounts for some 3.8% of GDP, even though Namibia imports more than 70% of its grain needs which poses a food security risk. (ibid.).

4. Water resources and supply

4.1 Water resources

The coefficient of variation in annual rainfall varies from about 30% in the north-east (where it is wettest) to over 100% in the driest parts, namely in the Namib and the south of the country (Mendelsohn, et al., 2009. Figure 2 indicates that the average annual rainfall ranges from about 600 mm in the north-east to less than 50 mm in the south and along the coast (MET, 2013). About 22% of the land area is classified as desert, 70% is arid to semi-arid, and the remaining 8% is dry sub-humid (ibid.).

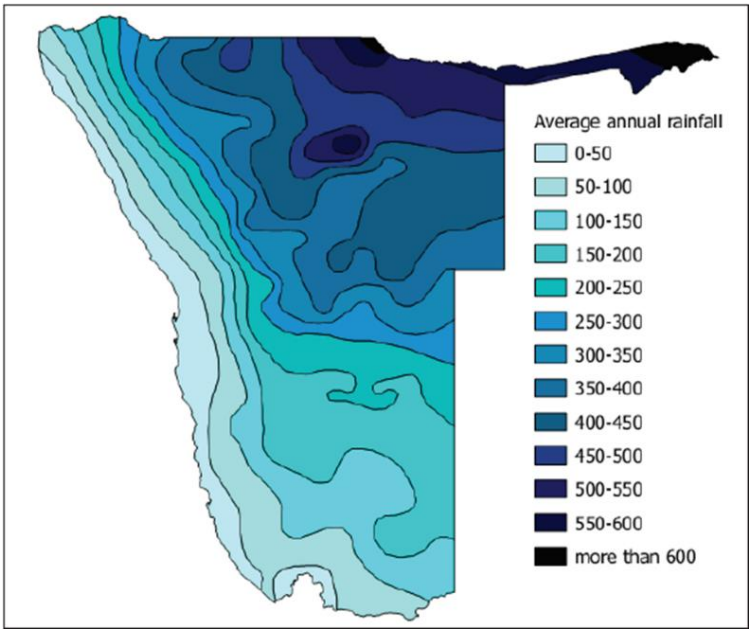

Figure 2: Annual rainfall distribution

Namibia's water resources are unevenly distributed throughout the country and there are no perennial rivers within the country's borders. Securing the supply of water in this environment places strong dependence on ephemeral river flow and groundwater resources. It is estimated that only about 2% of the rainfall ends up as surface run-off and a mere 1% becomes available for natural recharge of the groundwater. The total internal annual renewable water resources available countrywide from the ephemeral rivers and groundwater sources are estimated at 500 Mm^3 per year. Approximately 50% of all water used by people and 78% of the water used by livestock is obtained from groundwater sources (Christelis & Struckmeier, 2001).

The predicted increase in both temperature and in rainfall variability will increase Namibia's reliance on groundwater, since ephemeral surface water resources will become even more temporary, and will be subjected to higher evaporative losses. The climate change predictions are also likely to have consequences for groundwater quantity and quality. The impacts on groundwater recharge are unclear, but one confirmed consequence is that bush encroachment, which will accelerate due to carbon fertilisation, reduces groundwater recharge rates (Bockmühl, 2009). This will be magnified by reduced rainfall and its erratic nature at times as predicted by the Global Climate Models. This will likely reduce the overall capacity and recharge of aquifers.

On the issue of chemical water quality, decreased recharge is likely to cause concentrations of solutes to increase, which will exacerbate the situation of places which already have inadequate supply from groundwater sources in terms of quantity and quality. High levels of total dissolved solids, and elevated concentrations of fluoride and nitrates, are experienced in many parts of the country (Christelis & Struckmeier, 2001). These chemical contaminants may reach higher concentrations with climate change.

This brings two challenges:

- High rainfall variability makes recharge into aquifers also variable, so groundwater reserves in many places are not reliable.
- Groundwater quality in terms of dissolved solids content is poor in many places (NamWater, 2007) being above the thresholds for certain chemicals (e.g. fluoride and nitrate) for safe human consumption. Please refer to Annexure 1 for the Namibian Water Quality Guidelines and Standards for Potable Water.

Please note:

- The Namibian Water Quality Guidelines and Standards for Potable Water addresses a wide range of requirements, including physical, organic, inorganic, radioactivity and disinfection requirements and/or determinants.
- These guidelines and standards have not yet been prescribed by Regulation under the Water Resources Management Act, 2013 (Act No. 11 of 2013), but are in a final form and are already applied by the Namibia Water Corporation Limited (NamWater) in anticipation of their publication in the Government Gazette.
- This project proposal principally deals with the chemical quality of water intended for human consumption, and specifically as pertains to the inorganic macro determinants listed in Table 1 of the document “Namibian Water Quality Guidelines and Standards for Potable Water”. No non-compliance with any other determinants or requirements exists at the two project sites.
- Unless where explicitly stated otherwise, in this proposal the use of the terms “quality” and “quality standards” as pertains to water intended for human consumption will be a reference to the chemical quality of water as per the guidelines and standards applicable to the list of inorganic macro determinants.
- The term “water quality standards” in this proposal thus refers to the applicable part of the standards and guidelines contained in the document “Namibian Water Quality Guidelines and Standards for Potable Water”.
- In determining compliance with these “water quality standards” the “Acceptable standard” and not the “Ideal guideline” for ranges and upper limits in Table 1 of the document “Namibian Water Quality Guidelines and Standards for Potable Water” in Annexure 1 will apply.

4.2 Water supply

The availability of water of suitable quality for the intended purpose is the primary limiting factor to development in Namibia. The exacerbation of water scarcity due to climate change has a significant impact on the country’s socio-economic development leading to major implications on all other sectors. The water sector in Namibia is also faced with many challenges related to the affordability of water supply, specifically to rural communities,

settlements and villages. As Namibia is a water-scarce country, water is recognized as a key national asset (MET, 2015).

As an arid country, Namibia depends heavily on its groundwater resources. However, in many areas the dissolved solids content of the water exceeds the approved threshold for human consumption to the extent that the health of consumers is compromised.

Since water tariffs are directly linked to the cost of supply, the costly approach of pumping water over long distances is not a feasible option for supplying small communities with good quality water. An alternative is to improve the quality of locally abstracted groundwater by applying treatment techniques, such as desalination. These in turn demand energy in the form of electricity, but many of the small communities are not coupled to the national electricity grid. Energy. In addition, electricity consumption is listed as constituting a large part of water provision cost generally. According to Dawoud (2005) as quoted by Dolnicar and Schäfer (2009), 50% of the cost of desalinated water is the energy component.

5. Electricity supply

As Southern African economies and populations grow, the region is facing an overall power deficit. This will also affect Namibia whose current electricity generation capacity is no longer able to meet the rising demand. Neighbouring Southern African countries, where most of the supplementary electricity is currently sourced, will soon not be able to export electricity as and when Namibia requires it (Electricity Control Board, 2012). This situation is likely to cause load-shedding and unexpected power cuts in Namibia.

Namibia's average population density of 2.7 persons/km^2 is one of the lowest in the world. The scattered pattern of towns and villages across the large area of the country means that electricity provision through a grid of power lines extending to all settlements, including remote villages, is not cost-effective. Figure 3 below (www.nampower.com.na) indicates areas that are currently not connected to the national grid.

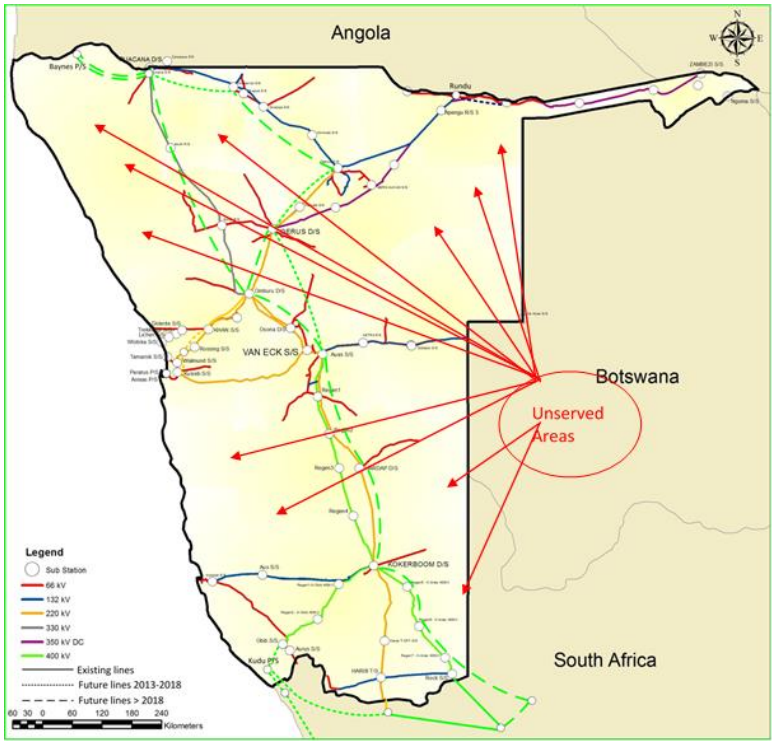

Figure 3: Namibian transmission network

In such a setting, local, small-scale generation of energy offers advantages in terms of the cost of electricity supply. The International Renewable Energy Agency in the opening statement of its report on cost analysis states that “Renewable power generation can help countries meet their sustainable development goals through provision of access to clean, secure, reliable and affordable energy” (IRENA, 2012). The proposed project is in keeping with international sentiment on the effective use of renewable energy to meet national needs. Worldwide, renewable energy currently accounts for more than 50% of all new power plants annually (REN, 2016).

In addition, the current national grid is supplied by energy imported from the region at levels between 60-70% annually in a setting where only 39% of the Namibian population has access to electricity (Stockmayer, et al., 2015) Renewable energy technologies can address such electricity supply gaps, and the cost of such technologies has significantly declined in the past decade, making them competitive with existing conventional generation methods (von Oertzen, 2014).

6. Project context

This project is proposed within the context of the climatic, economic, gender, water resources, water supply and electricity supply situation described above. The specific problem that the project will address is the negative social and health implications that the consumption of poor quality water has on many rural communities, which are expected to be exacerbated as the quality of water further deteriorates due to climate change. As is stated in Paragraph 4.2 above, supplying small communities with good quality water over long distances is not economically viable. An alternative to importing water is to improve the quality of the locally available water. However, treatment requires a power supply and many of these communities are not connected to the national electricity grid.

This project proposes to pilot the treatment of poor quality local groundwater to a level that complies with the national standards for drinking water, using hybrid renewable energy to power the treatment process. The acquired knowledge and skills will then be communicated to stakeholders in the water supply sector in order that the applied technology could be mainstreamed and replicated elsewhere in the country as an adaptation to climate change.

An elaboration of the project rationale appears in Part II, Section A

B. Project objectives

1. Overall objectives

The proposed project has the following 3 overall or main objectives:

Objective 1: **Acquire knowledge and skills** on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology that can be applied to improve the resilience of rural communities against climate change.

Objective 2: **Positively impact the lives of vulnerable individuals and communities at the two project sites** by supplying them with water that complies with the water quality standards for drinking water (including those standards pertaining to disinfection); raising their awareness of climate change and the effects on water supply, including the resultant decrease in the availability of good quality groundwater; and creating an understanding by them of why water should be used judiciously and why water tariffs are imposed.

Objective 3: **Communicate the acquired knowledge and skills to stakeholders in the water supply sector** and thereby promote the mainstreaming of such small-scale desalination technology and systems in the country

The motivation for adopting technological approaches with a positive impact on socio-health conditions are complex, and include:

Resource challenges
- Climate change impacts on water availability will increase
- Existing water scarcity and the fact that present water sources are stressed
- Other local unused sources that are currently not suitable for human consumption due to high total dissolved solids are available
- Use of such sources will negatively impact the health of the local population, especially children

Social challenges
- Rural communities are relatively poor with high levels of unemployment
- Women-headed households are dominant in rural communities, making them more vulnerable to climate change
- A better understanding is required of water demand and use in rural communities after desalination options become viable

Sustainability challenges
- To garner empirical evidence of renewable energy suitability in desalination operations in Namibia
- To provide knowledge growth and make sustainable water provision via desalination widely acceptable
- To obtain clear data and information to inform future water strategy and policy

Existing approaches to water supply utilise traditional water provision methods, relying heavily on “suitable sources” that are of good chemical quality and that, in the case of surface water, can be easily treated using conventional methods to remove silt. Currently, abstraction of water from boreholes utilises the national electricity grid or diesel to power powering the pumps. A paradigm shift occurs with the change of energy sources for both pumping of

boreholes and treatment of water, while adaptation occurs with the utilisation of previously unusable water sources.

2. Alignment of objectives

The proposed project is well-aligned to national objectives contained within the Constitution of Namibia, Namibian legislation and national policies, and to the country's understanding of its vulnerability to climate change and the need to adapt where possible. The project objectives also align with the Fifth National Development Plan (NDP5) and address the water and energy needs of the rural populace.

The project objectives, outputs and outcomes, and the alignment of the outcomes to the AF Results Framework are shown in Table 2 below.

Table 2: Alignment of project outputs and outcomes with AF outcomes

Project output	Project outcome	Desired AF-RF outcome
Objective 1: Acquire knowledge and skills on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology that can be applied to improve the resilience of rural communities against climate change.		
1. Compendium of applied knowledge and skills on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology.	1. Lack of knowledge does not prevent the establishment at NamWater schemes elsewhere in the country of small scale. desalination plants using RO technology and hybrid renewable energy technology. 2. Developed technical abilities of persons responsible for all aspects of the pilot plants, including recruited local people where applicable.	1. Increased adaptive capacity within relevant development and natural resource sectors. 2. Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses.
Objective 2: Positively impact the lives of vulnerable individuals and communities at two project sites, where they face increasing climatic challenges, gender bias, poverty and unemployment.		
1. Two effective and efficient desalination plants producing water that complies with the Namibian Quality Standards for Drinking Water. 2. Local beneficiaries and stakeholders who are sensitised re climate change, water quality, desalination, desalinated water and the hybrid power system. 3. Local beneficiaries and stakeholders who are	1. Negative socio-health impact of the previously untreated water on women in particular has been removed and the health of children improves. 2. Local communities have acquired knowledge on climate change, the effects on water supply, and understand why desalinated water should be used judiciously and why water tariffs are imposed.	1. Strengthened awareness of and ownership of adaptation and climate risk reduction processes at local level.

Project output	Project outcome	Desired AF-RF outcome
aware of the need to conserve water. 4. Acceptance by the beneficiaries of desalinated water. 5. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.		
Objective 3: Communicate the acquired knowledge and skills to stakeholders in the water supply sector and thereby promote the mainstreaming of such small-scale desalination technology and systems in the country.		
1. Demonstrated effectiveness and efficiency of small-scale desalination plants using RO technology and hybrid renewable energy technology to stakeholders in the rural water sector. 2. General availability of technical information (a blueprint) for establishing small-scale desalination plants using RO technology and hybrid renewable energy technology.	1. Acceptance by stakeholders in the rural water sector that small-scale desalination powered by renewable energy is a viable option to improving the quality of water supplied. 2. Water supply institutions (other than NamWater) has the required information and knowledge to establish small scale desalination plants using RO technology and hybrid renewable energy technology throughout the country. 3. Rural communities welcome desalination as the basis for their water supply.	1. Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. 2. Increased adaptive capacity within relevant development and natural resource sectors. 3. Improved policies and regulations that promote and enforce resilient measures.

C. Project components and financing

Planning and implementing the proposed project is carried out under 7 project components as shown in Table 3, each with distinct outcomes, outputs and a budget. The specific objectives of the proposed project and its components are well aligned with the Results Framework of the AF (AF RF), as is shown in the table.

Table 3 presents the relationships among project components, activities, expected concrete outputs and the corresponding budgets.

Table 3: Project components, activities, outputs, outcomes and budget

Project components and activities	Expected concrete outputs	Expected outcomes	Budget (USD)
Objective 1: Acquire knowledge and skills on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology that can be applied to improve the resilience of rural communities against climate change.			
1. Development of pilot desalination plants at Bethanie and Grünau.	**Functional desalination plants established.**	**Acquired knowledge of the design, construction and installation of small desalination plants based on RO technology.**	**2 284 230**
1.1 Civil works: • Bush clearing of site; fencing of evaporation ponds • Construct evaporation ponds • Line evaporation ponds • Construct roof structures for package plants	Completed civil works at Bethanie and Grünau.	Readiness to construct pilot water treatment plants.	
1.2 Pilot water treatment plant: • Acquire UF/RO pilot package plant • Install pilot plants • Test and commission plants; train operators	Installed pilot water treatment plants at Bethanie and Grünau.	Readiness to connect the pilot treatment plant to the existing system and to install control and data collection instrumentation.	

Project components and activities	Expected concrete outputs	Expected outcomes	Budget (USD)
• Acquire spares for piloting			
1.3 Mechanical and electrical works: • Connect plant to existing systems and reticulation • Install pipes, valves and raw water storage • Install flowmeters and instrumentation • Install telemetry/radio communication	Completed M&E works at Bethanie and Grünau.	Readiness of the pilot treatment plants to be connected to the power supply plants.	
2. Development of pilot hybrid renewable energy plants at Bethanie and Grünau.	**Functional hybrid renewable energy plants established.**	**Acquired knowledge of the design, construction and installation of hybrid renewable energy plants to power small desalination plants.**	**1 486 154**
2.1 Acquire and install: • Wind turbines • Solar fields • Battery banks (48 V) • Inverters & BOS • Electrical & SCADA equipment • Civil works for safety and security systems	Completed pilot hybrid renewable energy plants at Bethanie and Grünau.	Readiness to test and commission hybrid renewable energy plants at Bethanie and Grünau.	
3. Testing and commissioning of plants at Bethanie and Grünau; and training of staff and students.	**Operational plants with well-trained operators.**	**Knowledge and understanding of operating the plants and of adjusting the treatment train to achieve required quality of water.**	**19 161**

Project components and activities	Expected concrete outputs	Expected outcomes	Budget (USD)
3.1 Test all components and complete systems, correct shortcomings, adjust controls, verify quality of product water.	Desalination plants ready to continuously produce water for piloting period.	Readiness to incept piloting.	
3.2 Provide specialized training to dedicated operations and maintenance staff.	Trained operation and maintenance staff.	Operation and maintenance can be effectively done.	
3.3 Produce training, operations and maintenance manuals.	Training, operations and maintenance manuals.	Staff and future interested parties have an information source to access.	
3.4 Involve a gender balanced group of tertiary institution students in all aspects of plant establishment to facilitate knowledge dissemination	Tertiary technical students who had practical exposure to the design, construction and operation of small RO desalination plants using hybrid power supplies.	Tertiary technical graduates with practical knowledge of desalination and renewable power supply that can be applied in the water supply industry	
4. Piloting of the plants at Bethanie and Grünau.	**4.1 Functional desalination plants powered solely by hybrid renewable energy plants, yielding water of good quality.** **4.2 Updated operational and maintenance manuals.**	**Increase resilience of the community members more especially women headed households to the effect of climate change.**	**367 917**
4.1 Operate, maintain and improve the desalination plants.	Good quality water and optimized desalination plants.	Better health of beneficiaries.	
4.2 Operate, maintain and improve the power plants.	Renewable power and optimized power plants.	Less stress on the environment by not using electricity from the grid.	
4.3 Update the training, operations and maintenance manuals.	Updated manuals.	Staff and future interested parties have latest information to refer to in need.	

Project components and activities	Expected concrete outputs	Expected outcomes	Budget (USD)
4.4 Collect technical and social information, and record lessons learned.	Compendium of knowledge on small-scale desalination plants with hybrid renewable energy sources.	Increased capacity to adapt.	
4.5 Site visits by a gender balanced group of tertiary institution students, to impart knowledge and skills on the plants and the associated social effects on the beneficiaries.	More aware students regarding desalination, hybrid renewable energy and water interaction with communities.	Specific climate adaptation techniques will be propagated and implemented.	
Objective 2: Positively impact the lives of vulnerable individuals and communities at two project sites, where they face increasing climatic challenges, gender bias, poverty and unemployment.			
5. Supply good quality water to the communities at the two project sites during piloting of the plants.	**Good quality water is available to all inhabitants of Bethanie and Grünau. using renewable energy sources.**	**Improvement in health of the beneficiaries and increase in their adaptive capacity to climate change:** **1. Development of negative social impacts due to the previously untreated water, especially on girls and women, has been stopped.** **2. Development of fluorosis in children is halted and the general health of the beneficiaries is improved.** **3. Local communities have acquired knowledge on climate change, the effects on water supply, and understand why water tariffs are imposed.**	**0** **(Note that the cost of Component 5 is included in the cost of Activities 4.1 and 4.2 of Component 4, since the two activities cannot be separated.)**

Project components and activities	Expected concrete outputs	Expected outcomes	Budget (USD)
5.1 Operate and maintain the desalination plants.	Good quality water using renewable energy sources.	As above.	
5.2 At the end of the piloting period, hand over the infrastructure to NamWater	Ensured continuation of good quality water supply using renewable energy sources.	As above.	
6. Sensitise beneficiaries and local stakeholders at Bethanie and Grünau.	**Acceptance of desalinated water by the majority of the community members at the two project sites and by the local officials.**	**1. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.** **2. Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses.**	**7 299**
6.1 Hold various public meetings and demonstrations to share information.	Beneficiaries and stakeholders who are aware of and understand the concepts of climate change and adaptation, renewable energy sources and the need to conserve water; and who accept the use of desalinated water.	Project communities and specific social groups groups understand and accept the intervention.	
6.2 Directly target children at school with information supply.			
6.3 Use female technical and social students to impart knowledge and skills to community women, and to survey their response to the intervention.			

Project components and activities	Expected concrete outputs	Expected outcomes	Budget (USD)
Objective 3: Communicate the acquired knowledge and skills to stakeholders in the water sector and thereby promote the mainstreaming of such small-scale desalination technology and systems in the country.			
7. Information and knowledge dissemination to regional and national stakeholders.	**Stakeholders in the rural water supply sector embrace desalination, especially powered with renewable energy..**	**Small-scale desalination technology and systems become mainstream in the country.**	**5 474**
7.1 Conduct workshops with community leaders, government officials on local and regional level, and policy- and decisionmakers in the rural water sector to share the project experience and lessons learnt from the project.	Stakeholders who are aware of the pilot study and its results.	Stakeholders in the rural water sector accept that small-scale desalination using renewable energy is a viable option to improving the quality of locally available water.	
7.2 Distribute technical information and lessons learnt to technical groups in the public and private sector.	General availability of pilot study outcome and technical information (a blueprint) for establishing small-scale desalination plants with hybrid power supply.	Planning, design and construction of future small-scale desalination plants and hybrid power plants is simplified.	
Project activities cost (A)			**4 170 235**
Project execution cost (B)			**437 759**
Total project cost (A+B)			**4 607 994**
Project cycle management fee (C)			**391 680**
Total financing requested			**4 999 674**

D. Projected calendar

Table 4 below shows the high-level project calendar. A more detailed calendar appears in Part III, Section H.

Table 4: Projected calendar

Milestones	Expected Dates
Start of project implementation	April 2018
Mid-term review	April 2021
Project closing	March 2022
Terminal evaluation	June 2022

PART II: PROJECT JUSTIFICATION

A. Project components

1. Project rationale

This project is proposed within the context of the climatic, economic, gender, water resources, water supply and electricity supply situation described above (Part I, Section A, Paragraphs 1-5). A summary of the contextual aspects on which the rationale of the proposed project is built is:

- Namibia depends heavily on its groundwater resources.
- The predicted increase in both temperature and rainfall variability due to climate change will increase Namibia's reliance on groundwater.
- High levels of total dissolved solids and elevated concentrations of fluoride and nitrates are experienced in many parts of the country.
- Many small communities are supplied with groundwater that does not comply with the water quality standards for drinking purposes.
- Decreased recharge due to periods of lower rainfall caused by climate change is likely to cause an increase in total dissolved solids in groundwater, which will exacerbate the situation.

In view of the foregoing, the specific problem that the project will address is the negative social and health implications that the consumption of poor quality water has on many rural communities, which are expected to be exacerbated as the quality of water further deteriorates due to climate change. Supplying small communities with good quality water over long distances is not economically viable solution to the problem. An alternative to importing water is to improve the quality of the locally available water. However, treatment requires a power supply and many of these communities are not connected to the national electricity grid. It is also considered that these energy needs should be met by sustainable and climate resilient methods, and not be dependent on non-renewable, volatile and environmentally unsound resources. Namibia has an abundance of sunshine. Wind energy is less reliable in the interior of the country, but can be combined with solar power through hybrid renewable energy technology to offer a possible solution to electricity generation in remote areas.

The aim of the project is thus to pilot the treatment of poor quality local groundwater to a level that complies with the national standards for drinking water, using hybrid renewable energy to power the treatment process. It is intended that the treatment will be a desalination process based on RO and that electricity generation will be based on a combination of solar and wind energy. The capacity of the treatment system will be on a scale commensurate with the water demand of a typical rural community.

Execution of the project will yield a wide range of information and knowledge on both technical and social aspects of establishing and operating such treatment and power plants. In the technical field, this will allow conclusions to be drawn on the feasibility and viability of constructing, operating and maintaining such systems; in the social field information and experience will be

gleaned on how to involve the beneficiaries and local stakeholders to obtain their support for and acceptance of desalinated water. The acquired information, knowledge and skills will then be communicated to stakeholders in the water supply sector in order that the applied technology could be mainstreamed and replicated elsewhere in the country. Students will be involved in execution of the project and will thus be exposed to the nature and use of the technology used in the trial.

NamWater, the proposed executing entity, is the mandated national bulk water supplier for the country and as such has extensive experience in construction, management, operation and maintenance of water supply schemes, including many smaller schemes that supply water to settlements and small villages. During the pilot operation and maintenance period of two years the local communities will be supplied with water that complies with the new Namibian quality standards for drinking water. NamWater, who also owns the existing water supply schemes where the desalination trials will take place, has agreed to take over operation, management and maintenance of the created infrastructure. A successfully executed pilot project will thus lead to a permanent improvement of the quality of the water supplied to the communities, and the negative health and social implications due to the currently supplied poor quality water will be at an end.

2. Project sites

2.1 Site selection and location

It was considered essential to pilot two plants in a rural setting, one of which could be regarded as “very small” and the other as “small”, with their desalination capacities differing by an order of magnitude. This would allow the opportunity to establish whether plant size affected aspects such as operation, management and maintenance requirements, the unit cost of water produced; the involvement of beneficiaries; and the interest of stakeholders.

The project concept initially submitted to the AF proposed two sites, namely at Uis in the Erongo region and at Bethanie in the Karas region. However, Uis was removed for the following two reasons:

- The sustainable yield of the poor-quality groundwater source intended for use at Uis has not yet been quantified.
- The present water supply at Uis is already based on the importation of water over a long distance, and the basic problem is not quality but sustainable quantity of supply

A new selection of sites was carried out, based on the question: “*At which NamWater rural schemes can desalination pilot projects be run, the outcomes of which can be rolled out as a solution to supply water of a quality which complies with the water quality standards, in sufficient quantities to supply the reasonable water demand and at a cost that is lower than that of alternate options?*” The resultant site selection flow diagram is depicted in Figure 4 below.

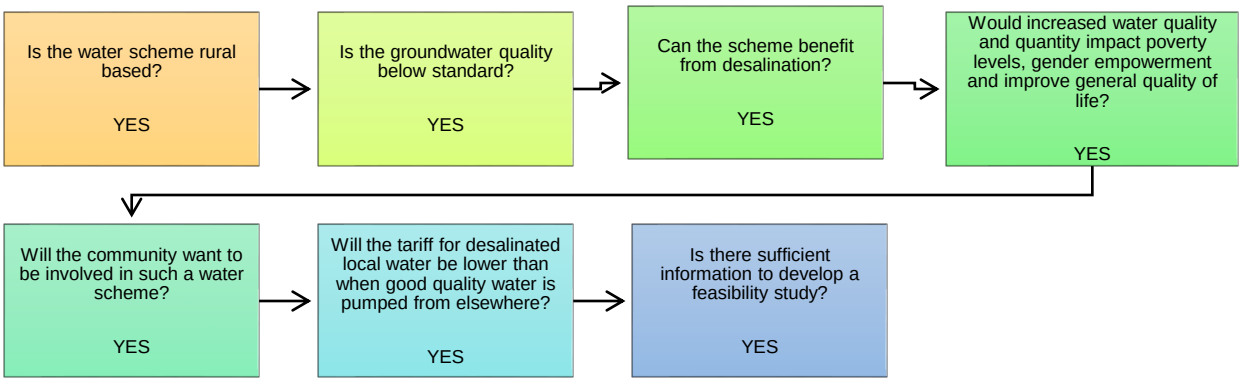

Figure 4: Site selection flow diagram

Three potential sites were identified, namely Bethanie and Grünau in the Karas region, and Epukiro Post 3 in the Otjozondjupa region. Epukiro Post 3 presented well in its need for desalination in terms of water quality and the relevant social pressures such as gender empowerment, poverty and climate change pressures. This potential site was, however, eliminated after an environmental and social impact assessment ESIA (Aurecon, 2017) showed that the high nitrate content of the groundwater was probably due to pollution caused by cattle pens situated near the boreholes and by leaking sewage pipes. In addition, the water reticulation infrastructure was found to be in extremely bad shape, resulting in major water losses (ibid.).

The two selected project sites are at Grünau settlement and at Bethanie village, located in the Karas region in the far south of Namibia. Please refer to Figure 5 below.

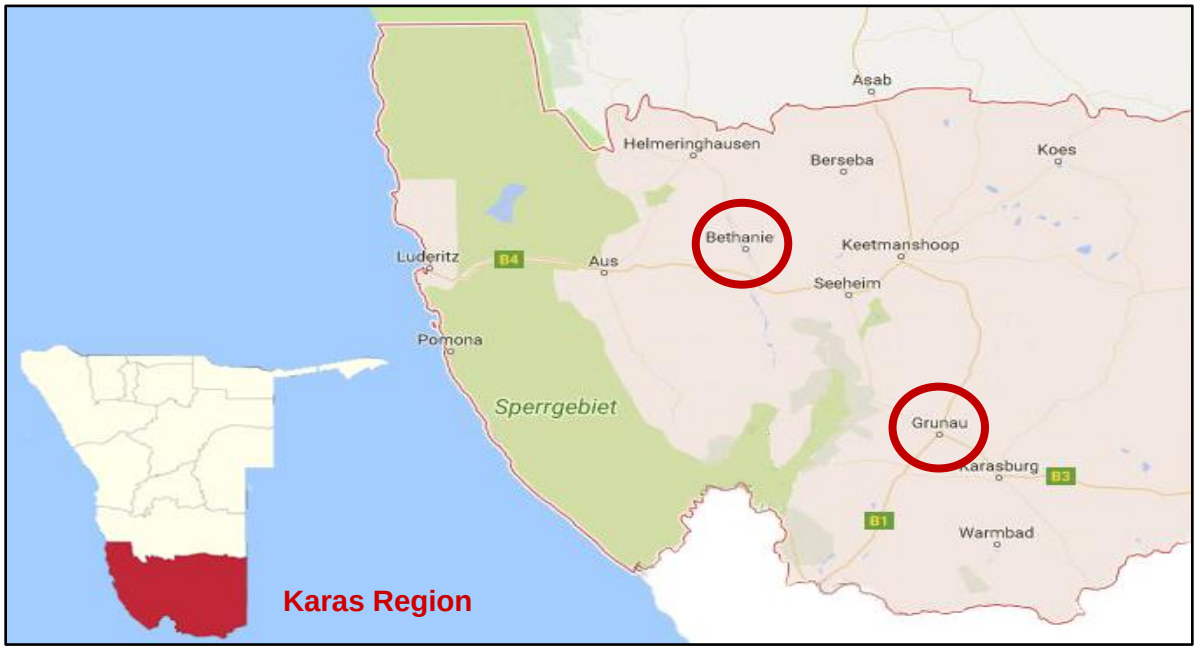

Figure 5: Location of project sites

2.2 Description of project sites

The communities at both Grünau and Bethanie have high poverty levels, typical of many small towns, villages and settlements in central and southern Namibia. The situation is caused by their low level of economic activity, i.e. very low agricultural potential due to aridity, little manufacturing and industrial activity, with corresponding low levels of services and tertiary economic activities. These communities experience in-migration from surrounding rural areas that which cannot sustain the growing population. In contrast to the regional statistics, a gender ratio is displayed that is biased towards women because men tend to seek employment in larger urban centres. Children are very often attended to by their grannies, whose only means of support are their monthly state pensions.

A summary of the population statistics of the Karas region appears in Table 5 below.

Table 5: Population statistics of the Karas region

Statistic	2011	2001
Sex ratio: Males per 100 females	104	114
Population density		
People per sq. km.	0.5	0.4
Age composition, %		
Under 5 years	11	11
5 – 14 years	19	20
15 – 59 years	63	63
60+ years	6	6
Labour force, 15+ years, %		
Employed	68	71
Unemployed	32	29

Source: Namibia 2011 Population and Housing Census Main Report by NSA

Bethanie

The current estimated population is 2 978 people.

Bethanie is classified as a village and hence falls under the authority of the Ministry of Regional and Local Government, Housing and Rural Development. It is administered by a Village Council who is the main bulk water customer and who manages the water reticulation system. Bethanie is a primary growth point according to the Karas Regional Development Plan. The water supply scheme is owned and managed by NamWater and the Bethanie Village Council is responsible for the management of the water reticulation.

The water scheme supplies the village from two production boreholes (WW12708 and WW12777) located within the Konkiep River, 50 m apart and approximately 2.85 km away from the main reservoir. A 150 mm diameter, 2 850 m long Class 12 AC pipeline with a capacity of 1 527 m^3/day connects the two boreholes to the main reservoir. The main reservoir is a concrete ground level reservoir with a capacity of 750 m^3 which collects the water from the boreholes and from where it

is lifted by two booster pumps to the 18m high elevated concrete reservoir of 180 m^3 capacity. The outlet of the elevated reservoir is 12m above ground level and gas chlorination takes place between the booster station and the elevated reservoir. The capacity of the chlorination facilities is 4 mg/l for 3 500 m^3/day. Mechanical production meters are installed at the two boreholes and a 100mm ABB Kent Taylor bulk electronic sales meter is installed in a manhole at the outlet of the elevated reservoir (NamWater, 2010).

Past and current operation of the boreholes makes no major impact on the aquifer, and there is sufficient capacity to meet the present and future demand. The scheme currently runs at a maximum of 53% of its recommended abstraction rate, and even in a high-growth scenario this is expected to be about 60% in 2030. The borehole pumps are activated and de-activated automatically via ball valves in the reservoir, and the scheme has an operator that checks daily that the systems are functional.

Water is reticulated to the town where it is metered at its discharge points to the end consumers. The Council indicated that 90% of households have a supply of water to their erven, while the remaining 10% have access to water through communal stand pipes. There is waterborne sewage in the town, while a bucket system is used in the toilets in the informal settlement. The existing water infrastructure is rated as sufficient until at least 2030.

The blended borehole water does not comply with the new proposed water quality standards and has a high fluoride content, on average 3.06 mg/l, that classifies the water as Group D and not suitable for human consumption according to the current guidelines. In addition, other parameters also exceed the concentration limits given in the guidelines; these include calcium, sodium, chlorides, sulphates, total dissolved salts and turbidity as displayed in Table 6 below. Chlorination is occasionally inadequate, leading to the presence of bacteriological contamination by coliforms.

Elevated fluoride intake is known to be a cause of dental fluorosis presented as dental mottling and pitting. Ingestion of fluoride after 6 years of age does not cause dental fluorosis. Chronic high-level exposure to fluoride can lead to skeletal fluorosis. In skeletal fluorosis, fluoride accumulates in the bone progressively over many years. The early symptoms of skeletal fluorosis include stiffness and pain in the joints. In severe cases, the bone structure may change and ligaments may calcify, with resulting impairment of muscles and pain (WHO, 2001). Dental fluorosis may have social impacts in that the brown teeth in women and girls causes problems with friendships and romantic relationships. Lower self-esteem may impair academic and job performance, and can lead to increased vulnerability to drug and alcohol abuse.

During stakeholder consultations at Bethanie, community members ascribed the following symptoms experienced by themselves to the poor quality of their water: brown teeth, headaches, high blood pressure, gastrointestinal disturbance. The gastrointestinal disturbance is most probably caused by bacteriological contamination of the drinking water, but headaches and high blood pressure are not caused by fluoride.

Table 6: Water quality at Bethanie

Parameters	Ideal guideline (mg/l)	Borehole water (mg/l)
Cations		
Calcium	<200	227
Magnesium	<125	59
Potassium	<25	3.9
Sodium	<100	148
Anions		
Alkalinity, as HCO3		222
Chloride	<100	119
Fluoride	<0.7	3.06
Nitrate	<6	2.3
Sulphate	<100	194
Other		
Conductivity	<80	114
TDS	<500	764
pH	6.0 – 8.5	8.13
Total hardness	<200	286
NTU	<0.5	1.95
SiO_2		42
Colour	10	2.6

Grünau

The current population is estimated at around 500 persons.

NamWater supplies water in bulk to Grünau, which consists of both formal and informal communities. Reticulated water is supplied to erven in the formal part, while the informal part of the settlement has communal standpipes. The Karas Regional Council is responsible for and manages the municipal services through the Grünau Village Council. Due to water shortages, the Council has prohibited building activities until the water crisis has been resolved. Development is therefore limited. The main bulk water customer is the Karas Regional Council which is responsible for settling the water account.

The current water sources for the Grünau scheme consist of six boreholes with a recommended total abstraction of 30 m^3/day. The combined yield of these boreholes is not enough to cope with the present demand of 30 m^3/day on the average day in the peak month. Water is available for 1.5 hours of the day and if no member of the household is home or in the area at the time, then the household does not have any water available for that day. NamWater has already investigated the incorporation of four additional existing boreholes, and plans to shortly install and connect them to the bulk water system. The increased supply capacity of 47 m^3/day will be sufficient to meet the projected demand for at least the next 17 years, while the existing bulk water pipelines and terminal storage are more than sufficient for the same period (NamWater, 2017).

The quality of the water supplied is classified as Group B/C according to the parameters of the water quality standards. Fluoride is the main parameter of concern with an average concentration of 2.26 mg/l, while the acceptable limit is < 1.0 mg/l.

The six boreholes pump to two ground level reservoirs; four of the borehole abstraction pumps are diesel driven and the other two are solar-powered with panels. The production boreholes are connected via 90 mm, 63 mm and a 160 mm uPVC pipelines to the 100 m^3 reservoirs. The two reservoirs are connected with a 90 mm uPVC pipeline over distance of 6.5 km. From the mechanical bulk water meters the water gravitates into a 100 m^3 galvanized steel panel tank on a 12 m high tower.

However, the blended water from the presently utilised boreholes do not comply with the applied water quality standards for human consumption due to various parameters as is shown in Table 7 below. These parameters include mainly fluoride, and also magnesium, sodium, chlorides, total hardness, conductivity and iron at times.

Table 7: Blended water quality at Grünau

Parameters	Ideal guideline (mg/l)	Borehole water (mg/l)
Cations		
Calcium	<200	393
Magnesium	<125	207
Potassium	<25	4.5
Sodium	<100	154
Anions		
Alkalinity, as HCO3		359
Chloride	<100	200
Fluoride	<0.7	2.26
Nitrate	<6	26
Sulphate	<100	145
Other		
Conductivity	<80	177
pH	6.0 – 8.5	8.13
Total hardness	<200	286
NTU	<0.5	1.95
SiO_2		42
Colour	10	2.6

The effects of elevated fluoride intake are as described above for Grünau. There is no conclusive evidence that hard water (i.e. containing high levels of both calcium and magnesium) is a health risk. It is a nuisance because of poor soap and/or detergent performance and it also has a poor taste. During stakeholder consultations the community members mentioned the same symptoms as those experienced at Bethanie.

3. Infrastructure scope

3.1 Conceptual desalination plant design

Bethanie

The conceptual design of the membrane pilot plant is based on a product water (RO permeate) capacity of 23 m^3/h for a 20-hour day production to achieve 460 m^3/day of product water demand. The future water demand estimate for 2028 of 487 m^3/day was given according the NamWater Master Plan (NamWater, 2010), and the additional amount of water can be supplied with blending as the process steps in Figure 6 below illustrate that the product water will be blended with raw water from the borehole scheme to ensure a more stable water quality (CCPP positive) is supplied to the community to reduce corrosion in the reticulation system. The blending ratio foreseen for this scheme will be 1:2 for Raw borehole water: RO permeate; this means that an additional 10 m^3/h will be available to the 23 m^3/h of RO product water, bringing the total to 33 m^3/h.

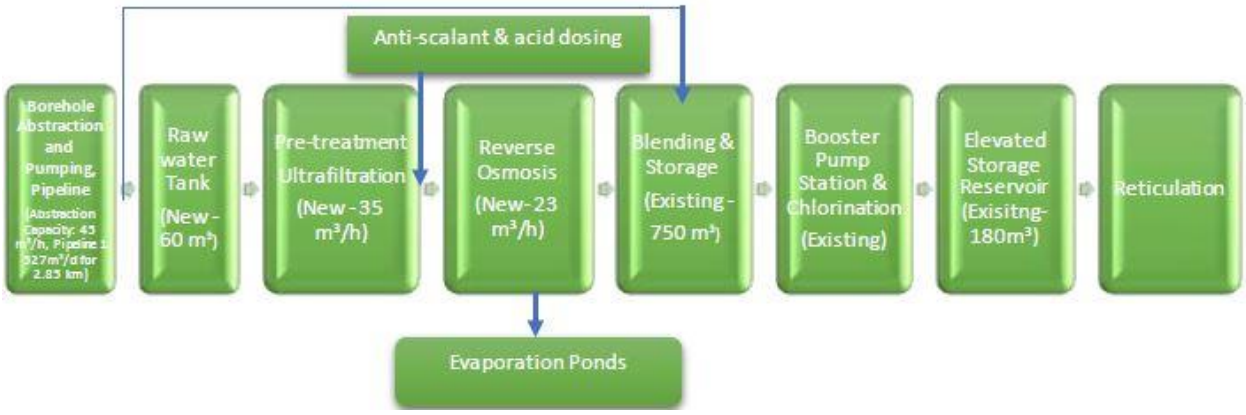

Figure 6: Desalination process train at Bethanie

Conceptual details of the membrane plant design parameters are displayed below in Table 8. The backwash water from the ultrafiltration plant was not included for disposal to brine, as it can be recycled back to the raw water tank. Pipework should be designed to allow recycling to raw water tank and disposal to brine for chemical enhanced backwashes. Cleaning chemicals for the ultrafiltration plant will be prescribed by the membrane technology supplier. Provision will be made for antiscalant and/or acid dosing before the RO unit; this will be useful to experiment with during piloting to see if recovery rates of the RO plant can be improved when running with dosing antiscalant and/or acid.

The brine/concentrate from the RO plant is estimated to be produced at a rate of 7.5 m^3/h. Considering the rural application of the technology and the availability of land and sunlight, evaporation ponds are proposed as the most suitable technology for brine disposal. The evaporation ponds' design capacity is calculated to be 54,750 m^3/annum and the total surface for the ponds are 16,930 m^2 (considering evaporation at 3400 mm/annum and average rainfall at 166 mm/annum). It is proposed that three ponds with each having a surface area of 5,645 m^2 be constructed and a depth of 1.5m.

Table 8: RO and UF operating parameters at Bethanie

Parameter	Values
RO Permeate Rate	23 m^3/h
RO Concentrate Rate	7.5 m^3/h
UF Feed Rate	35 m^3/h
UF/RO Average Membrane Flux	30 - 85 lmh
Operating Temperature Range	15-30 ^oC
System Inlet Pressure	0.7–4.5 bar
Max Design Recovery (RO)	75%

The evaporation ponds will be lined with a poly/plastic lining to prevent contamination of the groundwater resources and the ponds will have to be fenced off to prevent livestock drinking the brine. The salt will have to be removed from the ponds at least once or twice per year to ensure no salt build-up in the ponds.

Grünau

The process train and operating parameters at Grünau is the same as for Bethanie. The pilot plant was sized for a MF/RO plant of 6 m^3/hr RO permeate production and microfiltration pre-treatment to stabilise the operation of the RO plant. The microfiltration unit is estimated to have a feed rate of 9 m^3/hr.

Brine/concentrate will be produced at 2.5 m^3/hr and will be disposed to evaporation ponds that will be lined and fenced in for protection of ground water sources. The evaporation ponds design capacity is calculated to be 5,475 m^3/annum and a total surface area for the ponds are 1,685 m^2 (considering evaporation at 3400 mm/annum and average rainfall at 400 mm/annum) and a pond depth of 1.5m. It is proposed that three ponds with each having a surface are of 560 m^2 and depth of 1.5m to be constructed.

The salt will have to be removed from the ponds at least once or twice per year to ensure no salt build-up in the ponds. A specific use or other environmental friendly way of disposal for the removed salts will need to be established.

Blending of the final water with raw water is required to ensure a stable water quality (CCPP positive) will be provided for protection against corrosion in the reticulation at a ratio of 1:2 raw water:permeate product. Provision will be made for the dosing of antiscalant and/or acid as chemicals for improved performance of the RO membranes when required.

3.2 Conceptual hybrid power supply design

The power supply is intended for the desalination plants only. The rationale behind this is that the water sources are not within the immediate vicinity of the designated RO sites and further, they can be effectively supplied by well-known solar photovoltaic water pumping systems. Namibia has vast experience in these systems.

The conceptual plant configurations and assumptions made for providing for wind, solar and battery components are set out in Table 9 below.

Table 9: Power supply considerations and assumptions

Consideration	Assumed Parameter
Hybrid power Hybrid battery voltage Power Supply Quality	Wind, solar and battery storage combination 48 V DC 400 V AC, 3-phase, 50 Hz
Power needs for RO plant Ancillary power needs	100% +10%
Energy demand/ m^3 of water Water demand - Bethanie Water Demand –Grünau Solar Availability Wind Availability	4 kWh/m^3 460 m^3/d 50 m^3/d Worst month irradiation – site specific Worst month low speed – site specific

Energy demands	Bethanie	Grünau
Total demand (kWh)	1 840	200
Demand/hour (kWh)	77	8

A schematic layout of the hybrid power supply appears in Figure 7 below.

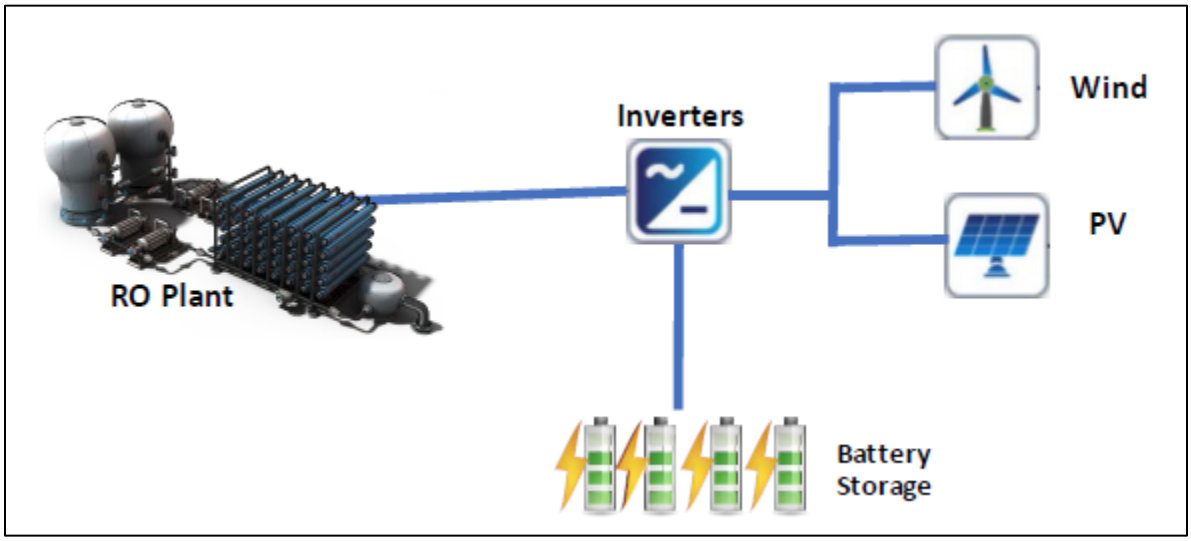

Figure 7: Schematic layout of the hybrid power supply

4. Scope of project components

Each of the three project objectives are to be attained by executing one or more project components, amounting to 7 in total. The project objectives and project components all have outputs and outcomes, being the sum of the outputs and outcomes achieved by the activities and actions carried out under the various components. These have been presented before:

- The project objectives and their outputs and outcomes, aligned with the AF outcomes are listed in Table 2 in Part I, Section B, Paragraph 2 above.
- The 3 project objectives, their 7 project components and 18 activities, each with their outputs, outcomes and budgets at activity level are listed in Table 3 in Part I, Section C above.

This paragraph addresses the indicators associated with the component objectives and aligns them with the AF indicators, and also shows the breakdown of the activities per project component into actions to be carried out.

4.1 Component 1: Development of pilot desalination plants at Bethanie and Grünau

Component 1 will involve the development of **Pilot Desalination Plants** at the existing NamWater schemes situated at Bethanie village and Grünau settlement. The objective indicators and the corresponding AF outcomes and outcome indicators are listed in Table 10 below.

Table 10: Component 1 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
Increased knowledge of design and construction of sustainable and climate resilient RO plants using membrane technology.	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.	4.1 Development sectors' services responsive to evolving needs from changing and variable climate. 4.2 Physical infrastructure improved to withstand climate change and variability-induced stress. 5 Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress.

The proposed output, activities and actions of this component are shown in Table 11 below.

Table 11: Component 1 outputs, activities and actions

Components and activities	Actions taken
OUTPUT 1: Functional desalination plants established. **Activities:** 1.1 Site selection and technical engineering design with the involvement of tertiary institutions in the field and assessment studies. 1.2 Conduct EIA and obtain Environmental Clearance. 1.3 Technical procurement and construction of Desalination Plants. 1.4 Establish functional pipelines, connecting the treatment plant output to the existing reticulation systems.	**Site confirmation and technical engineering design:** • Finalise sites for desalination plant • Compile plant design, including CAPEX and OPEX projections • Consider alternatives for disposal of the brine with minimal environmental impact. • Record all significant factors and specifications, as part of the documentation to inform replication at other sites. **EIA to obtain Environmental Clearance:** • Compile project information and environmental and social baseline • Scoping of issues • Public consultation • Assessment of impacts • Consideration of alternatives and mitigatory measures • Compilation of Environmental Management Plan • Submission for Environmental Clearance Certificates **Execute engineering, procurement and construction (EPC) of desalination plant:** • Procure desalination package plants to specification • Install package plant and appurtenances

The proposed technology under this component will contribute to the adaptation in the following ways:

Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors

Outcome 5 Increased ecosystem resilience in response to climate change and variability-induced stress:

- Diversification of water supply by providing alternative or supplementary sources of water when current water resources is inadequate in quantity or quality
- Resilience to water quality degradation

4.2 Component 2: Hybrid renewable energy plants at Bethanie and Grünau

This component will involve the production of energy required by the desalination process and will be the development of **Hybrid Renewable Energy Plants** at Grünau and Bethanie to supply sustainable power for Component 1. This situation favours combining renewable energy with water abstraction to improve resilience against water shortages brought on by climate change. The objective indicators and the corresponding AF outcomes and outcome indicators are listed in Table 12 below.

Table 12: Component 2 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
Increased knowledge of design and construction of sustainable and climate resilient hybrid solar/wind power systems for use in desalination plants.	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.	4.1 Development sectors' services responsive to evolving needs from changing and variable climate. 4.2 Physical infrastructure improved to withstand climate change and variability-induced stress. 5 Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress.

The proposed output, activities and actions of this component are shown in Table 13 below.

Table 13: Component 2 outputs, activities and actions

Components and activities	Actions taken
OUTPUT 2: Functional hybrid renewable energy plants established. **Activities:** 2.1 Site selection and technical engineering design with the involvement of tertiary institutions in the field and assessment studies. 2.2 Conduct EIA and obtain Environmental Clearance. 2.3 Technical procurement and construction of hybrid renewable energy plants.	Site selection and technical engineering design: • Finalise sites for solar farm and wind turbines • Compile plant design, including CAPEX and OPEX projections • Record all significant factors and specifications, as part of the documentation to inform replication at other sites. **EIA to obtain Environmental Clearance:** • Compile project information and environmental and social baseline • Scoping of issues

	• Public consultation • Assessment of impacts • Consideration of alternatives and mitigatory measures • Compilation of Environmental Management Plan • Submission for Environmental Clearance Certificates **Construction of desalination plant:** • Procure solar units and wind turbines to specifications and services to install on site • Construction of solar farm and wind turbines feeding into integrating unit

The proposed technology under this component will contribute to the adaptation in the following ways:

Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors

Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress

- Sustainable and climate resilient renewable energy power supplies.
- Increased knowledge of solar and wind system performance for desalination activities

4.3 Component 3: Testing and commissioning of plants at Bethanie and Grünau; and training of staff and students

This component entails indicators, output and activities that will carry out to test and commission components 1 and 2. The objective indicators and the corresponding AF outcomes and outcome indicators are listed in Table 14 below.

Table 14: Component 3 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
• Increase the technical understanding of how the plants operate or will be operated. • Effective operation of the plants by well-trained operators.	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.	2.1 No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks. 6.2 Percentage of targeted population with sustained climate-resilient livelihoods.

The proposed output, activities and actions of this component are shown in Table 15 below.

Table 15: Component 3 outputs, activities and actions

Components and activities	Actions taken
OUTPUT 3: Operational plants with well-trained operators. **Activities:** 3.1 Test all components and complete systems, correct shortcomings, adjust controls, verify quality of product water. 3.2 Provision of specialised training for Operators in the operation and maintenance requirements of the hybrid renewable energy plants that can power the desalination plants. 3.3 Production of training and maintenance manuals, so that the information is formalised and can be passed on without loss of content. 3.4 Constant involvement of tertiary institution students with a focus on gender sensitisation to facilitate knowledge dissemination and experience.	**Testing of the plants to ensure effective operation.** **Training provided to the operators by NamWater and the project team:** • Identification of suitable persons to be trained • Initial training session • Continuous monitoring and updating on training needs **Production of training and maintenance manuals so that the information is formalised and can be passed on:** • Drafting of Operational and Maintenance manuals • Review of Operation & Maintenance manual to ensure efficient communication to users **Testing and commissioning:** • Commissioning of solar units and wind turbines (only) • Commissioning of integrated system i.e. renewable power unit, pumping equipment and desalination plants

	• Commissioning of desalination equipment (only) • Commissioning of desalination equipment (complete with pumping equipment)

In view of the expected outputs and project objective indicators proposed for this component, it is believed that the component will contribute to adaptation fund in following ways;

Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses.

Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas:

- Improving and increasing the technical and social abilities of persons responsible for water management and delivery.
-

4.4 Component 4: Piloting of the plants at Bethanie and Grünau

This component will involve piloting and operation of the plants. The objective indicators and the corresponding AF outcomes and outcome indicators are listed in Table 16 below.

Table 16: Component 4 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
• Operational desalination plants operated solely from renewable energy supplies (wind and solar). • The information and knowledge acquired allow continuous plants operation without interruption in the supply of good quality water.	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced Stress.	4.1 Development sectors' services responsive to evolving needs from changing and variable climate. 4.2 Physical infrastructure improved to withstand climate change and variability-induced stress. 5 Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress.

The proposed output, activities and actions of this component are shown in Table 17 below.

Table 16: Component 4 outputs, activities and actions

Components and activities	Actions taken
OUTPUT 4: Functional desalination plants powered solely by renewable energy hybrid power plants. Updated operational and maintenance manuals. **Activities:** **4.1** Operation and maintenance of desalination plants. **4.2** Operation and maintenance of the hybrid renewable energy plants that power the desalination plants. **4.3** Collection of data at the plants to determine the effectiveness and efficiencies of the plants performance. **4.4** Collection of information from the general public and stakeholders on their perception about the desalinated water. **4.5** Collection of information from women and children (School children) on their perception about the desalinated water. **4.6** Facilitate the involvement of tertiary institution students with a focus on gender sensitisation to facilitate knowledge dissemination and experience.	**Operation of the system for 2 years with quarterly inspections and reports:** • Operation of the plants • Quarterly inspections & Reporting • Compilation of all the significant steps and components during construction and operation, with involvement of students from academia. • Consultations with communities to assess their perceptions • Review and document all lessons learnt

This component contributes to adaptation in following ways;

Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors.

Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress:

- Operation of commissioned desalination plants
- Desalination plants operated solely from renewable energy supplies (wind and solar).
- Information gathering, information compilation and data-basing along with analysis reports
- Community engagement and consultations on the effect of climate change on water quality and how the proposed project is or will mitigate the challenge.

4.5 Component 5: Supply good quality water to the communities at the two project sites during piloting of the plants

This component will involve supplying the community members at the proposed sites with good quality water during the piloting period. The objective indicators and the corresponding AF outcomes and outcome indicators are listed in Table 18 below.

Table 18: Component 5 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
• Increase in the supply of good quality water • An increase in women and children or community at large adaptive capacity to climate change • Reduction in the number of having brown teeth due to poor water quality and thus improve romantic relationship and self-esteem in women • Reduction in the number of women losing their hair due to poor water quality. • Increase in the number children attending school due to improvement in health • Reduction in health incidents in women and children • Improvement in washing activities by women due to reduction in salts in water which prevents the lathering of soap • Percentage reduction in pipeline replacement affected by scale formation or reduction in plumbing appliance replacement by community members mostly by women headed households	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.	4.1 Development sectors' services responsive to evolving needs from changing and variable climate. 4.2 Physical infrastructure improved to withstand climate change and variability-induced stress. 5 Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress.

The proposed output, activities and actions of this component are shown in Table 19 below.

Table 19: Component 5 outputs, activities and actions

Components and activities	Actions taken
OUTPUT 5 Good quality water using renewable energy sources. Improvement in health status of women and children residing in the project areas. **Activities:** 5.1 Operate and maintain the desalination plants. 5.2 Supplying of good quality water. 5.3 At the end of the piloting period, handover of the infrastructure to NamWater to ensure continuation of water supply.	**Operation of the plants to supply good quality water to the communities.**

This component contributes to adaptation in the following ways:

Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors

Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress

4.6 Component 6: Sensitise beneficiaries and local stakeholders at Bethanie and Grünau

Table 20 below indicates the expected output and action under this component. This component will involve sensitisation activities to provide information to stakeholders on desalinated water impacts and benefits towards increasing their adaptive capacity to the impacts of climate change. The objective indicators and the corresponding AF outcomes and outcome indicators are listed in Table 20 below.

Table 20: Component 6 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
• Increased number of persons in the affected communities accepting desalinated water • Sensitise keys stakeholders such as Ministry of Environment and Tourism, Ministry Agriculture Water and Forestry, Ministry of Rural and Urban Development, NGO's and Ministry of Lands and Resettlement to accept desalinated water • Improvement in the understanding the effect of climate change on water quality by women and children • Improvement in the understanding of the usage of membrane technology and renewable energy as panacea to adapt to the effect of climate change • Increase in acceptance of the technology and thus reduction or eradication of the vandalism or stealing of the technology • Percentage of the targeted population aware of the effect of climate change on water quality and appropriate response	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.	2.1 No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks. 3.1 Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses. 3.2 Modification in behaviour of targeted population.

The proposed output, activities and actions of this component are shown in Table 21 below.

Table 21: Component 6 outputs, activities and actions

Components and activities	Actions taken
OUTPUT 6: Acceptance of desalinated water by the majority of the communities and keys stakeholders in the rural water sector. **Activities:** 6.1 Various public meetings, pamphlets, and demonstrations held that provide information and knowledge sharing to stakeholders about desalination, desalinated water and the importance of the hybrid power system. 6.2 Youth and Gender empowerment enhanced and accepted as being important to sustainability of communities. 6.3 Opportunities given to academic institutions to make female academics more aware of desalination, hybrid renewable energy and water interaction with communities and livelihoods 6.4 Sensitisation of stakeholders on the effect of climate change on water supply which is causing water scarcity..	**Sensitisation of village community about desalinated water through public meetings, pamphlets and demonstrations at the desalination and power plants.** **Phase 1:** Sensitisation of Village community (Introduction in EIA process). **Phase 2:** Sensitisation of Village community (Demonstration during commissioning). **Phase 3**: Sensitisation of learners at schools. **Phase 4:** Review public acceptance during operation. **Phase 5:** Review and revise sensitisation process if required. **Phase 6:** Sensitisation of stakeholders, and mainly learners and women on the effect of climate change on water supply and thus the change in behaviour to adapt to the changes.

Since adaptation is a participatory learning process, this component contributes to adaptation in the following ways:

Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses.

Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level:

- Increased number of persons in the affected communities accepting desalinated water
- Sustainable water demand understanding in the use of desalinated water

4.7 Component 7: Information and knowledge dissemination to regional and national stakeholders

Information and knowledge dissemination from the lessons learnt are mainstreamed as practical adaptive actions to increase resilience of rural communities. The project is designed to support the Government of Namibia via its executing entities in the water sector to address specific needs to advance adaptation at all relevant levels (national, sectoral, local), involving all relevant stakeholders (government, NGO, private sector). This component will involves information and knowledge sharing with stakeholders including school children or learners, more particularly women and girls about the project.

Table 22: Component 7 objective indicators and AF outcomes and indicators

Component objective indicator(s)	AF Outcome	AF outcome indicator
• Stakeholders in the rural water sector accept that small-scale desalination is a viable option to improving the quality of water supplied • Percentage improvement in women and children's knowledge of the effect of climate change on water quality • Well-informed key stakeholders on the effects of climate change and strong understanding of the effectiveness of the proposed technology to adapt to the effect of climate change • Percentage increases in knowledge of how to operate and maintain the plants	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 7: Improved policies and regulations that promote and enforce resilience measures.	2.1 No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks. 7 Climate change priorities are integrated into national development strategy.

The proposed output, activities and actions of this component are shown in Table 21 below.

Table 17: Component 7 outputs, activities and actions

Expected Concrete Outputs	Action Taken
OUTPUT 7: Stakeholders in the rural water supply sector embrace desalination especially powered with renewable energy and Water and Energy standards are amended / updated to capture this sentiment. **Activities:** 7.1 Lessons learnt from the operation and maintenance of desalination plant formally workshopped to various community and change maker groups and institutions. 7.2 Other new desalination plants powered by hybrid renewable energy are built or planned. (the new normal). 7.3 Water policy updated to include desalination. 7.4 Energy policy updating considers water needs for sustainable energy and specialised tariff arrangements. 7.5 Change makers are informed and made aware of gender sensitisation impacts of water interactions to facilitate knowledge dissemination and experience.	**Knowledge platform created by the EE (NamWater)** • Desalination plants working well • Workshops given to various stakeholders from local, regional and national levels • New desalination plants built or planned • Water policy impacted • Energy policy considers water needs • Meetings held with various change makers • Gender needs taken more widely and informed with new learning and evidence

This component contributes to adaptation in the following ways:

Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses

Outcome 7: Improved policies and regulations that promote and enforce resilience measures:

- Water and Energy standards and policies reviewed or amended
- Desalination plants becoming the “new normal”.

5. Project contribution to climate resilience

Climate change is expected to have adversely effect on the water sector in Southern Africa. Climate models have projected that the mean land surface warming in Southern Africa is likely to exceed the global mean land surface temperature. This means that more water will evaporate from the surface and little will be available to recharge groundwater and dilute the high concentration of salts and fluoride found in groundwater. Furthermore, the climate models have also projected a decrease in rainfall in Southern Africa. With medium evidence, the models have projected a reduction in raw water quality which will pose risks to drinking water quality even with conventional treatment. In view of these projections, surely the water of poor quality already found

in Namibia will deteriorate even further if adaptation measures or approaches are not tested or implemented.

The water quality at the selected sites is very poor and not suitable for human consumption. The proposed adaption measure to test if this problem or challenges of poor water quality can be improved is a technological and infrastructural adaptation approach. This approach at the proposed scale and combinations of membrane and renewable energy was never tested in Namibia and Southern Africa before.

The proposed project will involve various components that will strengthen adaptive capacity of the community and hence increase the resilience to climate change. The project will increase the available water resource for use by communities where local sources are of poor quality. The project will also build resilience through knowledge development and sharing, capacity building, communication and education.

Local officials will be used to manage the system. This helps to raise the adaptive capacity of the communities, which is an important component of resilience and overall sustainability. Sensitisation of local communities is an important part of the project, so that there is acceptance of the different taste and hardness of the water. Consumers who have learned about the system behind the ‘new’ water will be more likely to discuss it with pride, thereby helping the wider uptake of renewables.

In short, resilience will increase through increased awareness, access to potable water of improved quality and quantity, improved independence from external water needs and lower levels of uncertainty of water availability during drought periods.

Summed benefits are:

- Diversification of water supply
- Resilience to water quality degradation
- Sustainable and climate resilient renewable energy power supplies.
- Increased knowledge of solar and wind system performance for desalination activities
- Increased number of persons in the affected communities accepting desalinated water.
- Sustainable water demand understanding in the use of desalinated water.
- Community engagement and consultations
- Water and Energy standards and policies reviewed or amended
- Desalination plants becoming the “new normal”.

B. Economic, social and environmental benefits

Namibia being an arid country is already at a natural disadvantage. Climate change will increase rainfall variability, and the severity of droughts as well as bush encroachment will reduce groundwater recharge. Small towns and villages have little capacity to cope with providing essential services because of their low economic activity and small income base.

The project will result in improved resilience of vulnerable communities and groups to climate change impact, specifically to a decrease in water quality of existing groundwater sources. In addition to providing benefits to vulnerable communities in the target areas, the project will also serve to increase the capacity of government agencies to integrate climate change adaptation considerations into water supply planning and policy processes. As such. the delivery of benefits to vulnerable communities within and beyond the project target sites will be sustained.

1. Economic Benefits

The project will provide economic benefits to a wide range of beneficiaries due to the structural nature of the technical facilities required and the water produced using sustainable energy. Employment will be the highest during the construction phase and then be minimal immediately thereafter. Incidental employment will accrue as the increased and adapted water availability starts to impact activities in the community.

In terms of paradigm shifts, the current practise is that the rural communities largely consist of the less economic active people since the more active people move temporary move to towns to find jobs. Therefore, the communities consist largely of women, children and the elderly who are also expected to raise their grandchildren. Hence, it is safe to state that the economic benefits will impact most on the vulnerable communities.

To put “lower water tariffs” in perspective at off-grid schemes, water vendors are buying water at water supply points in 20 litre containers at the prevailing water tariff of circa USD 0.8/m^3 (USD 0.0008/litre), transport water by road to the off-grid communities with bad quality water and resell at circa USD 1.6 per 20 litre (USD 0.08/litre). Therefore, the tariff to the end user is increased by a magnitude of 100. Based on current cost of water from desalination plants, the cost recovery water tariff from these planned off-grid plants will be in the order of USD 0.003/litre versus the USD 0.08/l which is the present going water tariff from water vendors.

At present, the bulk water tariff (Namibia Water Corporation Limited, 2017) for the 2 communities is as follows (based on N$13 = 1 USD):

- Grünau - USD 1.08/m^3
- Bethanie - USD 0.91/m^3

The project will have an economic, social and environmental impact at these sites in the future and to wherever this technology approach will be rolled out to rural areas which are currently not served with a water supply scheme. If this project is tested successfully, it will open opportunities at other settlements in Namibia which are currently deprived from sufficient quantities of good quality water.

The investment into the facilities (*water and electricity*) has a high impact on the country but will impact the communities during construction and beyond. The outcome of the project will also improve food security and have associated health benefits resulting in increased general health and self-esteem particularly for females.

- Employment – Low Impact
- Investment – High Impact

Since the purpose of this project is to set up pilot plants to test the financial, environmental and social feasibility of supplying water with an improved quality and at reduced costs, specific economic benefits for specific communities have not been assessed. However, it can be concluded with certainty that the following economic benefits will result from this project if rolled out on a national basis:

- Reduced medical expenses due to improved health
- Increase in overall revenues because of additional employment opportunities
- Reduction in urbanisation with associated reduction in cost to local governments as a result
- Increase economic activities in community e.g. production of subsistence food production and high value crops
- Improvement of national economy by reducing costs of services (water and power) to vulnerable communities.

2. Social benefits

The social benefits of the project will be realised by improving health, saving lives, improving livelihoods and building community cohesion through the supply of improved water quality and quantity and reduced cost to vulnerable communities, fostering the participation of women in the value chain of water supply and other social activities in the vulnerable communities.

Other important social benefits of the project will result from the capacity building and knowledge generating activities, which are designed to facilitate the meaningful participation of beneficiary communities and vulnerable groups. This participatory approach will encourage a sense of ownership, supporting the sustainability of project interventions, and strengthening community cohesion, the empowerment of women and gender equity.

The project will deliver social benefits to vulnerable communities and groups, officials and other public stakeholders, fostering community resilience to the impacts of climate variability and change. It may also result in introducing climate-resilient crops and climate-smart farming techniques on a subsistence scale not necessary by using treated water but untreated water available in the area.

Capacity building activities will focus on working with communities, local and traditional authorities to explore and identify a range of adaptation options and strategies, focusing on improving the effective and efficient use of water.

Gender equity will be fostered by the inclusion of a Gender and Social Expert in the Component 4 team with Project training and capacity building activities that will help to ensure meaningful

opportunities for women and other vulnerable groups participation in project planning, implementation and community decision making structures.

A recent and reliable source for gender-disaggregated data and socio-economic data on potential beneficiaries could not be found and therefore the Gender and Social Expert will gather this data for each specific site and include it in their output.

- Income – Medium Impact
- Health – High Impact
- Education – Medium Impact

3. Environmental benefits

The project will deliver a range of environmental benefits. These will include reducing adverse impacts associated with poor and inappropriate use of water. The project will result in improved resilience of vulnerable communities and groups to climate change impact e.g. increase in scarcity of water and/or decrease in water quality of existing water sources. In addition to providing benefits to vulnerable communities in the target areas, the project will also serve to increase the capacity of government agencies to integrate climate change adaptation considerations into municipal planning and policy processes and in so doing, to sustain the delivery of benefits to vulnerable communities within and beyond the project target sites.

However, it is believed that the most significant impact will be as a result that the following will not be required because of this project: additional generation of electricity, expansion of the national electricity grid, manufacturing and construction of water supply infrastructure to connect to the current water supply grid. It is estimated that the CO_2 not emitted from conventional generation would be approximately 0.9 kg/m^3 of water (Zhou et al 2009). This will inevitably reduce the carbon print required if connections to the national electricity and regional water supply grid would be required.

- Water source increase – High Impact
- GHG mitigation – High Impact
- Safe water – High Impact

C. Cost effectiveness

1. Cost effectiveness of the concept

Part I, Section A, Paragraph 4.2 states that supplying small communities with good quality water over long distances is not economically viable, and that an alternative to importing water is to improve the quality of the locally available water. The project proposes to establish how to effectively and efficiently improve the quality of local groundwater by means of desalination.

For the two sites selected for this project the above statement can be confirmed simply by comparing the capital cost of establishing infrastructure to import water to the capital cost of establishing desalination plants at the sites.

The closest sustainable good quality water source to Bethanie is the Naute Dam (the Neckartal Dam at 67 km from Bethanie is still under construction). In the case of Grünau it is the Orange River. The capital costs of establishing the required infrastructure to supply the two sites from those sources are summarised in Table 21 below.

Table 18: Capital cost of supply alternatives

Site	Alternative supply option	Capital cost (USD)
Bethanie	**Water from Naute Dam Water Treatment Plant (WTP)** New scheme Naute-Bethanie to pump treated water from the WTP to Bethanie includes an offtake structure, 106 km pipeline, three pump stations, three balancing reservoirs, powerline/other power source for booster pump stations.	**7.2 million**
Grünau	**Water from the Orange River to Grünau** New scheme Aussenkehr-Grünau to pump treated water from a WTP to Grünau with offtake structure, a new 126 km pipeline, four booster stations, four balancing reservoirs; powerline/other power source for booster stations	**9.6 million**

Compared to the total amount of less than USD 5 million required to establish, test and improve the two pilot desalination plants plus power supply systems and to run them for two years, the capital cost to import water to the two sites amounts to USD 16.8 million. There is no doubt that the long-established principle that using local water first is more cost-effective than importing water remains valid, even if the local water needs to be desalinated.

The water supply concept to be piloted by the project is thus cost-effective.

2. Sustainability of the project

From a sustainability point of view, a few aspects need to be considered:

- Irrespective of whether local groundwater is desalinated or good quality water is imported, the water supply schemes will be owned, managed operated and maintained by NamWater, the national bulk water supplier. NamWater has legal agreements with all bulk water customers, and thus cannot unilaterally decide to abandon the schemes and stop supplying water.
- The cost to produce desalinated water can only be estimated at this stage, but it will be considerably higher than the present cost of producing poor quality water. This does not mean that the water tariff will be set at an unaffordable level, thereby making the desalination schemes non-sustainable. Cross-subsidisation of bulk water tariffs has been widely applied by NamWater; in 2012 for example 36% of all villages and 77% of all settlements were subsidised, with the subsidy ranging from 41% to 70% of the cost of water supply in the case of villages (NMA, 2014).
- Since that time the Water Regulator has been established in terms of Section 11 of the Water Resources Management Act, 2013, who will in future determine bulk water tariffs. Section 12 (4) (b) of the said Act requires that fees and charges for water supply must be effected in accordance with norms and standards prescribed in the national water pricing policy (to be prescribed by the Minister responsible for water affairs) and with due consideration to harmonising consumer expectations and without compromising the financial viability of service providers.
- It can thus be concluded that future bulk water tariffs at Bethanie and Grünau will be set at a level that is affordable to the consumers and that any shortfall on cost recovery at these water schemes by NamWater will be recovered by means of over-recovery at large water schemes serving more affluent municipalities elsewhere in the country.

3. Explanation of scope and approach

Piloting of desalination has been carried out on micro and very small scale, as is described in Part II, Section F.

The first objective of this project is to acquire knowledge and skills pertaining to desalination plants powered by hybrid renewable energy plants that are of a capacity suitable to provide typical rural communities with water. This can only be done by constructing, operating and maintaining such a scheme.

It was considered essential to pilot two plants in a rural setting, one of which could be regarded as “very small” and the other as “small”, with their desalination capacities differing by an order of magnitude. This would allow the opportunity to establish whether plant size affected aspects such as operation, management and maintenance requirements, the unit cost of water produced; the involvement of beneficiaries; and the interest of stakeholders.

The project proposes a period of two years for running the pilot plants. This is regarded as a practical piloting period to collect information on aspects such as performance and maintenance requirements, for training of staff, for sensitizing the communities, and to get the plants optimised

for demonstration to stakeholders in the water sector and to disseminate information to stakeholders. A shorter period would not suffice, while a longer period would not provide much more useful information.

4. Other possible interventions

There are other possible interventions that could have taken place to help adapt and build resilience in the water supply sector. One of the most important of such interventions could be to carry out a project aimed at establishing water demand management in towns throughout the country.

However, the need of disadvantaged and vulnerable people in rural communities who are supplied with water of an unacceptable quality is regarded to be higher than that of people in towns who have a sufficient supply of good quality water who will from time to time be subjected to water restrictions.

D. Sustainable development strategies

The proposed project is consistent with several national policies, strategies and undertakings pertaining to climate change, development and environmental management in Namibia, including:

1. Vision 2030

In 2004 the government launched Namibia's Vision 2030 which provides the overarching framework for the development of Namibia with the main goals of improving the quality of life of its people and achieving the status of a developed country by the year 2030.

Water resources development will significantly contribute to the achievement of the Vision 2030 goals and in this respect, will provide the framework for the water sector policy and strategy goals and objectives. The overarching goals for the water sector are fully aligned to meeting the Sustainable Development Goals and the sub-regional goals articulated in the SADC protocol.

2. Fifth National Development Plan (NDP5)

NDP5 identifies the need to continue uplifting the citizens, as well as the importance of water and energy in that quest. It also identifies that the water sector is at particular risk.

Rural communities, especially rural youth and women, are the most vulnerable groups of society. Water is an enabler and improvement to rural communities via service delivery goes a long way in providing transformation. Enablers identified are:

- Water resources
- Energy resources
- Electrification
- Rural development centres
- Private sector investment in the rural community and products
- Agriculture

3. Water Supply and Sanitation Policy (WASSP)

The WASSP (2008) policy has four main components:

- Essential water supply and sanitation services should be available to all Namibians, at an affordable cost.
- Provision of water and sanitation services should be based on community participation, mutual responsibility between government and the beneficiaries, and by outsourcing services under the supervision of government.
- Communities have the right to decide what water and sanitation services are acceptable to them, and they should pay towards their cost at increasing rates above basic needs.
- Efficient utilization of water, and environmentally sustainable development of sanitation services, should be pursued.

The objective for water supply is to develop reliable and accessible sources of safe water, with sufficient capacity, on a sustainable basis, to serve all in Namibia, at an affordable cost.

4. Integrated Water Resources Management

The Integrated Water Resources Management Plan (IWRMP, 2014) for Namibia is based on “a process that promotes the co-ordinated development, management and use of water, land and related natural resources to optimize the resultant economic, social and environmental welfare in an equitable manner without compromising the sustainability of vital ecosystems”. The overall long-term goal of IWRM in Namibia is to achieve a sustainable water resources management regime contributing to social equity, economic efficiency and environmental sustainability. In adopting IWRM, Namibia recognises that water is a key national asset.

5. Energy White Paper

The Namibian White Paper on Energy Policy (1998) stipulates 6 goals for the energy sector in Namibia; namely effective governance, security and supply, social upliftment, investment and growth economic competitiveness and efficiency, and sustainability.

For the electricity sector, it states that the country should implement a variety of generation methods, including renewable energy technologies, to make appropriate use of the natural resource base.

Energy from renewable sources (excluding hydropower) was targeted to reach 10% of the national generating capacity by 2012. This has since been surpassed, reaching approximately 23% as of June 2017.

6. Poverty Reduction Strategy

The Poverty Reduction Strategy (PRS) for Namibia, published in 1998, identified six structural problems that make poverty reduction difficult and which exacerbate vulnerabilities to climate change as well as limit adaptive capacity of Namibians. These problems included:

- a highly skewed distribution of income
- a weak agricultural resource base, characterized by limited and highly variable annual rainfall as well as sandy soils with low fertility
- a high population growth rate and the resulting pressure this puts on scarce resources such as water; as one of the strategies, the PRS considers new ways of using water more efficiently to be important

Poverty is taken seriously and is mainstreamed throughout all Namibian policies going forward. The latest being the NDP 5 (Ministry of Economic Planning, 2017).

7. UN Framework Convention on Climate Change

Namibia became a signatory to this international convention in 1998. Namibia is a non-Annex 1 country under the UNFCCC classification of developed and developing nations, and therefore does not have binding carbon dioxide emission limits. Nevertheless, the pollution produced by

generating electricity by conventional methods (i.e. fired by coal or diesel) is still a factor, therefore investments in energy technologies must consider this impact on the environment.

8. Vulnerability and Adaptation Assessment – Second National Communication to the UNFCCC (2008)

Namibia's Second National Communication to the UNFCCC (2008) notes that small towns have little capacity to cope with in-migration from the surrounding rural areas, because they have limited economic opportunities. The desired 'balanced' urbanisation as described in Vision 2030 is difficult to achieve because of high levels of unemployment in small towns, and the exodus of people from rural areas takes them more to the capital city or a few selected large towns where there are more readily accessible economic opportunities.

Importantly, the Second Communication suggested increasing the exercise of the best technical options available at any given time. This could include financing for targeted options which are deemed critically important to improve adaptive capacity.

9. Vulnerability and Adaptation Assessment - Namibia's Third National Communication to the UNFCCC (2015)

Country-wide increased water demand is expected as the population, industry, mining, agriculture and other sectors grow. The Third National Communication confirms that, on top of this, climate change is likely to limit the availability of water in the country, and recognises that poverty is an important driver in the sensitivity of people to climate change and their adaptive capacity to cope with it.

Poor people are usually marginalized in various ways (socially, economically, culturally, politically and institutionally), and have relatively lower access to essential resources such as crops, bought food, and health support. For the poor generally, climate change is superimposed on their existing vulnerabilities. For example, people living with HIV/AIDS will be made more vulnerable by water shortages, or by having to use poor quality water.

The Third National Communication also notes that water scarcity may trigger increases in the cost of water and sanitation provision. This will be most keenly felt by poorer sectors of the population, such as those living in informal settlements that will have to spend an even larger part of their income on water supply and sanitation services.

There are certain socio-economic and demographic groups which particularly exhibit vulnerability in the face of climate change. These include women and female heads of household, children and the elderly, the chronically sick and indigenous people. They also typically have low adaptive capacity through high levels of dependence on others for their survival, including their food security, mobility, and access to information. Together these factors tend to render these groups more vulnerable when exposed to climate change.

10. National Climate Change Policy(NCCP) and Climate Change Strategy and Action Plan

Namibia's policy framework to enable adaptation is formalised through the National Climate Change Policy of 2011. It mandates that sectoral climate change strategies be devised to address issues such as sustainable access to water, food security, agriculture, biodiversity and ecosystem services, health, fisheries and marine resources, infrastructure, sustainable energy and low carbon development. It also directs that activities be undertaken to ensure that the necessary elements needed to drive effective climate action are developed, for example with respect to education, training, institutional strengthening, policy and legislative development, disaster reduction and risk management, research, technology advancement, public awareness and access to information, international cooperation and financial resource mobilisation.

The Ministry of Environment and Tourism (MET) has developed, using an extensive stakeholder consultative process, a Climate Change Strategy and Action Plan for the period from 2013 to 2020, to implement the NCCP. The Plan is organised around the three key areas of adaptation, mitigation and cross-cutting issues.

Adaptation is addressed through four themes:

- Food security and sustainable biological resource base;
- Sustainable water resources base;
- Human health and well-being; and
- Infrastructure development.

The Plan identifies the need to maximise government financing instruments at the national and local levels; leverage private sector investment; and access scaled-up, new and additional (external) financial resources.

Table 19: National Climate Change Strategy Aims and Objectives (Adapted)

Strategic Aim	Targets	Activity
Further improve the overall climate change understanding and related policy responses in the water resources sector.	Understanding of climate change policy responses on the water sector is maintained and improved.	• Improve water planning and related decision-making processes to better manage climate change risk and uncertainty.
Strategies for harvesting and capturing water during the rainy season are well formulated and implemented, and guidelines for more efficient water use by sectors, households and individuals are provided.	Water infrastructure and facilities such as earth dams etc. constructed and optimizing the existing water facility and access.	• Identify and enhance positive outcomes from impacts of climate change • Explore other water sources or water infrastructure/innovative water storage of rain water, construction of dams, and maintain the water infrastructure

Strategic Aim	Targets	Activity
Improve access to sanitation and safe drinking water for all, particularly in flood-prone areas.	On-going improvement of sanitation done in conjunction with sanitation policy and strategy –more than half of the population in all towns have access to sanitation.	• Reduce pollution of water sources e.g. prepare against water contamination (chemicals) e.g. industries, irrigation schemes due to flooding.
Support institutional and human capacity building in integrated water resource management and use.	On-going efforts of supporting institutional and human capacity built e.g. MSc in IWRM.	• Promote stakeholder meetings to share experiences on water use and management • Improve water governance and increase collaboration amongst various water sectors – water supply and sanitation, irrigation and ecosystem maintenance
Establish, improve and enforce standards for infrastructure development and develop infrastructure that is more resilient to climate events.	By 2018, national strategy is developed and improved to guide the infrastructure development Climate change issues are integrated into all development planning and infrastructure development Infrastructure development standards are established, updated based on the needs by 2018.	• Develop a climate change infrastructure risk preparedness plan and risk reduction measures to increase resilience in all sectors • Develop the national strategy and guidelines for infrastructure (all infrastructures) development • Encourage and integrate climate change risks in the design and implementation of infrastructure development plans • Impose penalties against non-compliance to infrastructure spatial planning and development regulations and laws • Rehabilitate and improve existing infrastructure in areas where extreme events are predicted to cause damage or destruction to infrastructure

Strategic Aim	Targets	Activity
Promote and develop renewable energies at all levels to reduce GHG.	Renewable energy sources explored and promoted.	• Promote, invest in renewable energy sources (e.g. solar water heating technologies) • Explore and undertake further feasibility studies, building on previous studies, of renewable energy sources to harness energies in potential areas (e.g. wind, solar, biogas, etc)
Empower both men and women to participate meaningfully in the planning, testing and roll out of adaptation activities in all areas.	Have a meaningful participation of both men and women in climate change planning and decision making.	• Facilitate women's participation in climate change decision making at both local and national level • Advocate for equal participation of vulnerable groups in the implementation of climate change adaptation and mitigation activities

E. National technical standards

1. International protocols and agreements

Namibia is signatory to several international conventions that deal with the sustainable utilisation of natural resources and protection of the environment. These conventions also consider sustainable livelihoods of the most vulnerable groups in communities, particularly women and children. The main international conventions, protocols and treaties relevant to environmental management are as follows:

Table 20: International conventions, protocols and agreements ratified by Namibia

International protocols and agreements	Status
1. United Nations Convention on Biological Diversity (UNCBD)	Ratified
2. Biosafety (Cartagena Protocol)	Ratified
3. United Nations Convention to Combat Desertification (UNCCD)	Ratified
4. United Nations Convention on Climate Change (UNFCCC)	Ratified
5. Paris Agreement on Climate Change	Ratified
6. Vienna Convection for the Protection of Ozone Layer	Ratified
7. Montreal Protocol on Substances that Deplete Ozone Layer	Ratified
8. Stockholm Convention on Organic Pollutants	Acceded to convention

2. National legislation and procedures

Project implementation will also be executed in line with the legislative framework and procedures as depicted in Table 24.

Table 21: Compliance with legislative framework

Act, policy, or plan	Compliance
Environmental Management Act, 2007 (Act No. 7 of 2007)	To comply with Namibia's Environmental Management Act (2007) and Regulations (2012), the project will be the subject of an Environmental Impact Assessment during the planning and design phase. Components that are mandatory under the Act include public participation to address public concerns, and compilation of an Environmental Management Plan to ensure that mitigatory recommendations are carried out. According to the Act, the project will not be allowed to proceed without an Environmental Clearance Certificate issued by the Directorate of Environmental Affairs, Ministry of Environment and Tourism. This is not a risk to the project, since the Ministry has endorsed this project proposal.
National Policy on Climate Change for Namibia (2001)	The project is consistent with the National policy on climate change objectives that deal with reduction of climate change impacts on key sectors and vulnerable communities and integration of climate change issues (adaptation and mitigation) into sectoral policies, and national development.

Act, policy, or plan	Compliance
National Drought Policy (under review)	The proposed project objectives are aligned to the following objective of the Policy: • Ensure the continuous supply of potable water to communities
Water Resources Management Act, 2013 (Act No. 11 of 2013)	• The project will not require new boreholes to be drilled for abstraction of groundwater • The boreholes will be utilised sustainably • The water produced from the desalination plant will comply with the water quality standards
NDP5	The project aligns with: • The strategy to "Improve management of existing water sources" by addressing water quality • The indicated outcome of improved access to safe drinking water for human consumption

3. Compliance with the Environmental and Social Policy of the AF

Compliance of the project with the Environmental and Social Policy of the Adaptation Fund during project execution is described in Table 24 below.

Table 22: Compliance with the AF Environmental and Social Policy

Adaptation Fund Environmental and Social Policy (Revised March 2016)	
Stipulation	**How addressed in this project**
Project category	• A preliminary Environmental, Social and Gender (ESG) assessment places this project in Category B (projects with potential adverse impacts that are less adverse than Category A, because for example they are fewer in number, smaller in scale, less widespread, reversible or easily mitigated). • A proper screening exercise will be undertaken to confirm this categorisation during Components 1 & 2 as per the Environmental Management Act, 2007.
Social risk identification	Social risks have been identified and assessed in an open and transparent manner with appropriate consultation: • ESG scoping has been completed at the proposed project sites taking into account the Environmental Regulations. • To comply with the Environmental Management Act, 2007 and Regulations (2012), the project will be the subject of an Environmental Impact Assessment during the design phase. Components that are mandatory under the Act include areas already undertaken and that will be expanded for the EIA such as public participation to address public concerns, and compilation of an Environmental Management Plan. • The ESMPs attached to this proposal as Annexures 6 and 7 will form basis of this to ensure that mitigatory recommendations are carried out. • In terms of the Act, the project will not be allowed to proceed without an Environmental Clearance Certificate issued by the Directorate of Environmental Affairs, Ministry of Environment and Tourism.

Adaptation Fund Environmental and Social Policy (Revised March 2016)	
Stipulation	**How addressed in this project**
	• A full EIA will be undertaken in the planning and design phase, in full compliance with Namibia's Environmental Management Act, 2007.
The scope of environmental and social assessment	The scope of the environmental and social assessment will be commensurate with the scope and severity of potential risks. • The ESMG scoping exercise has been completed for all sites, which included public participation to address public concerns. • The ESMPs in Annexures 6 and 7 have been compiled. • The scope of the EIA assessment will be determined during the Scoping Phase of the EIA.
Environmental and social management	The project provides adequate opportunities for the informed participation of all stakeholders in the formulation and implementation of projects. • Participatory meetings with stakeholders and beneficiaries have taken place. Please refer to Social stakeholder engagement reports in Annexures 4 and 5. • Project Component 6 includes community engagement and consultations. • Project Components 6 and 7 provide for sensitization of, information sharing with and knowledge dissemination to the communities.
Compliance with legislation	The project will comply compliance with all applicable domestic and international laws. • The EIA to be undertaken in the planning and design phase will comply with Namibia's Environmental Management Act (EMA) (2007). • International commitments made by Namibia, such as to the UNFCCC or the Convention on Biological Diversity, will be addressed and met through the EIA. • There are no other international laws relevant to this proposed development.
Access and Equity	The project is designed to provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights. Projects should not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups. • The water provided by the project will be distributed through the normal system managed by the relevant Village Councils. No residents will be denied access to the service that is provided. • All consumers served by the project will be subject to the tariff system managed by the relevant Village Council or Regional Council. This follows a 'rising scale', where a minimum amount adequate for health and sanitation is provided at a basic fee. Consumers who use more (according to set thresholds) pay for the water at higher rates. This is part of the demand management system which seeks to provide a minimum amount of water for basic needs at an affordable fee, while curbing excessive use with higher fees.

Adaptation Fund Environmental and Social Policy (Revised March 2016)	
Stipulation	**How addressed in this project**
Marginalized and Vulnerable Groups	The nature of the project is such that there will be no adverse impacts on marginalized and vulnerable groups, or on any other group.
Human Rights	To respect and where applicable promote international human rights is a standing principle which underlies Namibia's Constitution, Vision 2030 and the Environmental Management Act. The project specifically supports the right to have access to sufficient quantities of good quality water for human consumption.
Gender Equity and Women's Empowerment	• The social component of the EIA will determine the prevailing situation with respect to gender equity in the local populations. • The ESMG / ESMP addresses issues to ensure that gender equity is achieved. • The ESMG/ESMP also defines the role of local communities and other concerned civil society stakeholder with consideration to gender issues.
Core Labour Rights	• The EIA will ensure that any relevant principles of the ILO are adhered to. • Engagement of local labour is addressed in the Social Stakeholder Engagement Reports in Annexures 4 and 5.
Indigenous Peoples	• The ESMG Scoping exercise has not categorized people as indigenous and non-indigenous. However, most of the beneficiaries can be regarded as indigenous, depending on how far back in history the cut-off for indigenousness lies. The original inhabitants of Namibia were the San, but nobody of this group was identified at the project sites. • Irrespectively, Government policy dictates that the rights of indigenous people be considered when considering actions that affect communities.
Involuntary Resettlement	No resettlement will take place because of the project due to the brownfield nature of the chosen project sites.
Protection of Natural Habitats	• The ESMG Scoping exercise has not identified any potential impact on critical natural habitats because of the project. • The project will be implemented on brownfield sites. • The EIA however will ensure that the projects do not impact any critical natural habitats. Please also refer to Section 2 and 3 of the ESMPs in Annexures 6 and 7.
Conservation of Biological Diversity	• The Scoping exercise has not identified any impact on natural habitats because of the project. • The Project occurs on brownfield sites. • The EIA will ensure that there will be no significant impacts on biodiversity. • The EIA recommendations will also address preventing the introduction of invasive species.
Climate change and drivers of climate change	• The project is designed to increase resilience of communities to the effects of climate change.

Adaptation Fund Environmental and Social Policy (Revised March 2016)	
Stipulation	**How addressed in this project**
	• The project will help to decrease greenhouse gas emissions, by adopting solar and wind energy generation.
Pollution Prevention and Resource Efficiency	• The project is designed to utilise sustainable renewable energy • Modern commercially available equipment will be used in the project, and energy efficiency will be the norm going forward. • The use of renewable energy will cut down on pollution from fossil based energy sources. • The ESMG scoping exercise has identified the “brine” as the only waste product. The project provides for construction of plastic lined brine evaporation ponds. Environmentally friendly disposal or use of the precipitated salts will be addressed in the full EIA. • The EIA will also address any waste and pollution matters pertaining to the construction phase. • The concept design provides for recirculation of water from the pre-filtration units.
Public Health	• The project has no potential negative impacts on public health. • As shown during the ESMG scoping exercise, communities have suffered detrimental effects from using the current water sources. • The project is aimed at treating water of poor chemical quality to comply with the quality standards prescribed for human consumption; the project will thus be beneficial to the health of the project communities. • Brine disposal ponds will be fenced to prevent access to people and especially to children who may be attracted by the water. This aspect will also be addressed during Component 4 of the project, i.e. sensitisation of beneficiaries and stakeholders.
Physical and Cultural Heritage	• The project will be carried out on brownfield sites. • Stakeholder engagement has not identified any heritage aspects that require consideration. • The EIA will also address prevention of potential harm to heritage sites that may be identified.
Lands and Soil Conservation	• The Scoping exercise has not identified any potential impact on natural habitats because of the project. • The Project occurs on brownfield sites. • No new access routes or roads will be developed. • The EIA will ensure that land degradation is prevented and that ecosystem services are not jeopardised.
Environmental and Social Management System	• The Scoping exercise has prepared appropriate ESMG / ESMP’s to guide the project. • The EIA will enhance the Environmental Management Plan (ESMP /ESMG’s) as per the requirements of the EMA and AF, by recommending measures to minimise or prevent possible environmental and social risks of the project.
Environmental and Social Policy Delivery Process and screening of Environmental and Social Risks.	• A preliminary ESG assessment (Annexures 3 and 4) places this project in Category B. • It is anticipated that this will be confirmed during the screening process at the first stage of the EIA.

Adaptation Fund Environmental and Social Policy (Revised March 2016)	
Stipulation	**How addressed in this project**
Environmental and Social Assessment	• A full EIA has not yet been done on the project, because the time to develop the proposal has been inadequate for that process. Therefore, an agreement setting out the terms and schedule for the EIA will be made as soon as the project is approved. • The full outcome of the EIA and its recommendations in the EMP will be communicated to the Fund upon completion of the EIA. • The EIA will address the three main issues identified in the Fund's Environmental and Social Policy, namely (i) all potential direct, indirect, transboundary, and cumulative impacts and risks that could result from the proposed project (ii) alternatives to the project; and (iii) possible measures to avoid, minimize, or mitigate environmental and social risks of the proposed project. • Please also refer to Section 2 and 3 of ESMP and the Social Stakeholder Engagement Reports.
Environmental and Social Management Plan	An EMP will be compiled, to fulfil the requirements of both Namibia's Environmental Management Act and the Fund's Environmental and Social Policy. A commitment to implementing the EMP will be made upon completion of the report.
Monitoring, Reporting, and Evaluation	The activities and outcomes of the EMP will be reported in the required project performance reports.
• Public Disclosure and Consultation	• A mandatory part of an EIA in Namibia is public consultation, including identification of Interested and Affected Parties, a process that allows them the opportunity to comment on and address issues of concern in the project, and reporting back to them on how the issues are addressed. • Public disclosure of the outcome and recommendations of the EIA is also legally required. • These aspects will need to be covered in the EIA process, to receive Environmental Clearance for the project. • Please also refer to the Stakeholder Consultation and Disclosure Plan Annexure 3.
• Grievance Mechanism •	• The NIE and the EE have grievance procedures in place (Please refer to Annexure 8), which will be implemented. • Further, the government authority for overseeing EIAs and environmental issues is the Directorate of Environmental Affairs (DEA), in the Ministry of Environment and Tourism. • There is an appeal procedure set out in the EMA that allows complaints about an EIA to be heard by the Environmental Commissioner. • Parties who feel aggrieved by a project or the response from the DEA, may also take complaints to the Office of the Ombudsman.

•

F. Duplication with other funding sources

The concept and application of desalination is not new to Namibia, since as far back as 1897 a seawater evaporation and condensation plant using coal as the energy source was put into operation at Lüderitz. Currently the largest desalination plant in Namibia is situated approximately 30 km north of Swakopmund. It applies RO with pre-filtration, belongs to Areva Resources Namibia, has the capacity to produce 20 million m^3 of product water per annum and is operated and maintained by Aveng Water Treatment Namibia.

However, no information could be found on any operational small-scale desalination plants that successfully supply potable water to rural communities in Namibia. No examples at all could be identified of wind-driven or hybrid solar and wind-driven desalination plants.

Two experiments with desalination in rural areas have been carried out:

a) Two projects were executed and completed in 2010 within the framework of a German-Namibian research project called CuveWaters. Under the project five different solar-driven desalination technologies were tested on a micro-scale at Amarika and Akutsima in the Omusati Region, with capacities of up to 3 m^3 of water per day. The project found that the membrane technology was effective and recommended that upscaled piloting should be carried out. The commercial viability of upscaled versions of these plants still has to be proved.

b) NamWater in 2010 procured two small low-pressure RO plants on rental basis from Pall International Company to experiment with desalination at rural water supply schemes situated at Epukiro Post 3 and Bethanie. The power source was electricity from the national grid. The tests were successful and supplied information that could be applied in full-scale piloting.

Finally, to the knowledge of the EE and the NIE there are no known small-scale pilot desalination projects currently being carried out in Namibia or envisaged for execution in the near future. Also, no information could be found that any Government authority, with or without donor assistance, or any NGO plans to soon install small-scale desalination plants to supply rural communities with water.

G. Learning and knowledge management

This is a pilot project that will be used to test the effectiveness of the technology and to address problems that may be encountered in implementation and further roll-out to other sites in the country. It is therefore important that the process is fully documented, to provide guidelines and instructions for further implementation.

The project will develop infrastructure to provide the necessary adaptive access to water and its associated direct benefits. The non-infrastructural components of the project are also specifically geared to provide increased knowledge and skills to increase resiliency at all levels of the project interaction.

The project will contribute to learning and knowledge management through the outputs following outputs and actions described below.

1. Outputs and actions

1.1 Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses

This action will provide state and non-state entities with the knowledge needed to guide current and future risk management to further enhance climate change strategies and national laws and policies. Lessons learnt will be invaluable as the empirical and qualitative information captured will improve the management and co-ordination of responses thus benefiting the livelihoods of rural communities and the nation at large especially where water and energy resources management / development is concerned.

Dissemination: Site visits, training and informal sessions, local media and social media.

1.2 Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level

The communities impacted directly benefit from tangible actions that show how even with worsening climatic conditions, they can adapt to it and value their resources while developing others. These communities will be good ambassadors when further replication and roll-out is required to become more national and new normal.

Dissemination: Site visits, training and informal sessions along with social media and radio in the local languages

1.3 Climate change priorities are integrated into national development strategy

Current policy decisions (Intended Nationally Determined Contribution (INDC), 2015; Water Resources Management Act, 2013; Namibia Third National Communication to the United Nations Framework Convention on Climate Change, 2015; National Climate Change Strategy & Action Plan 2013 - 2020, 2013; Namibia's 5th National Development Plan, 2017) can now be compared with tangible results to see how they have fared at local level action for adaptation or modification into future climate change strategies along with reviews of vulnerability assessments.

Dissemination: Site visits, Training sessions and local Media.

1.4 Improvement of technical abilities and skills of the officials responsible for the water schemes

Although underestimated by many, the acceptance of new methods and technologies by not only communities but by change makers and implementers can be a risk if not manged effectively. The availability of “touch and feel” created by practical examples existing thus provides that confidence required to then go on and develop progressive actions in the future. This therefore is the background to ensuring that officials are well trained and knowledgeable around the technologies employed to help adapt to climate change. Every opportunity must also be used to ensure the communities feel involved.

Dissemination: Site visits, Training and informal sessions and local Media along with social media

1.5 Introduction of desalination as an acceptable and proven technology

This is abroad action that will impact from individuals all the way up to policy makers and will be handled via effective collection and dissemination of the data gathered throughout the process.

Dissemination: Community meetings, Media - local along with social media

1.6 Acceptance of desalinated water by the communities

This is desired as an outcome but must be managed well with close interaction with the community.

Dissemination: Site visits, informal sessions and local Media supported by local radio and social media

1.7 Operation of the pilot plant, including data analysis

The availability of “touch and feel” created by practical examples existing once again provides that confidence required to then go on and develop progressive actions in the future. Every opportunity must also be used to ensure the communities feel involved.

Dissemination: Site visits, training and informal sessions and appropriate exposure via local and social media.

2. Components

The components geared to fulfilling this are described below.

2.1 Component 3: Testing and commissioning of plants at Bethanie and Grünau; and training of staff and students

Training of dedicated persons to capably manage and operate Components 1 and 2 through the development and pilot phase operations with a view for sustainable operations.

Table 23: Component 3 outcomes

Project outcome	AF Desired outcome
• Improving and increasing the technical and social abilities of persons responsible for water management and delivery. • Readiness to incept piloting. • Operation and maintenance can be effectively done. • Staff and future interested parties have source to refer to in need	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socio-economic and environmental losses. Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.

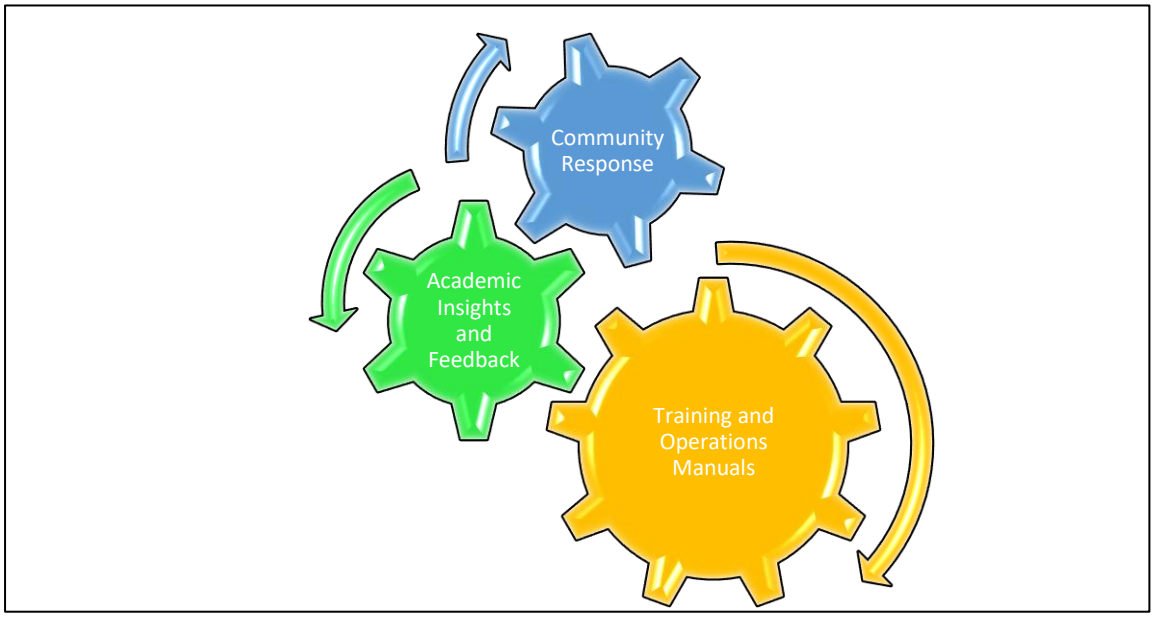

Figure 8: Training Loop - knowledge informed by feedback

2.2 Component 6: Sensitise beneficiaries and local stakeholders stakeholders at Bethanie and Grünau

Sensitisation activities to provide information and knowledge sharing to stakeholders on desalinated water impacts and benefits towards increasing their adaptive capacity to the impacts of climate change.

Accrued benefits will align with national development plans (NDP5) increasing youth and gender empowerment and increased participation.

Table 24: Component 6 outcomes

Project outcome	AF Desired outcome

• Increased number of persons in the affected communities accepting desalinated water. • Sustainable water demand understanding in the use of desalinated water. • Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level. • Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses • Increased understanding of the effect of climate change on water supply and thus the ability to adapt to the changes and the types of adaptation needs and options needed or available, including the need to use desalinated water judiciously.	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.

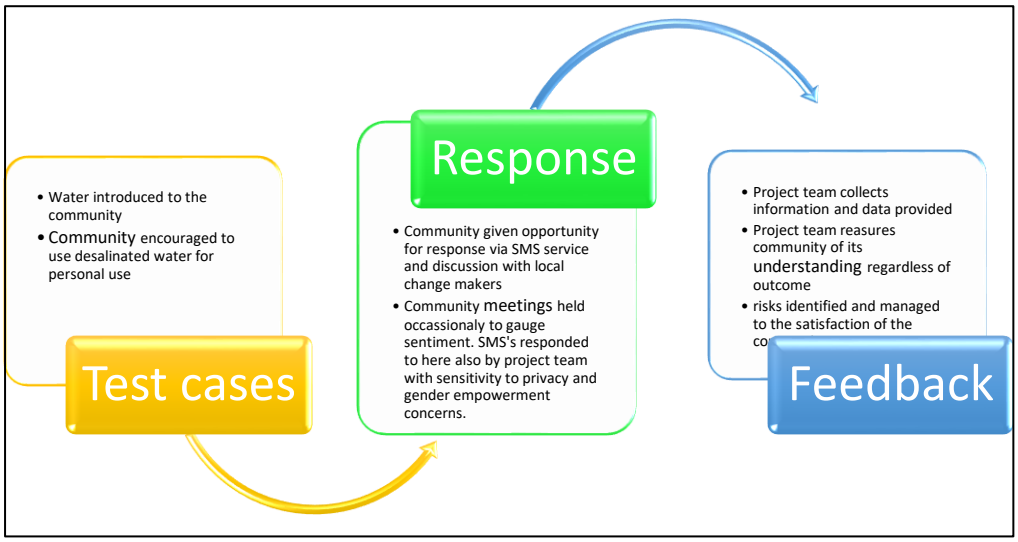

Figure 9: Knowledge management process for sensitisation

2.3 Component 7: Information and knowledge dissemination to regional and national stakeholders

Information and knowledge dissemination from the lessons learnt are mainstreamed as practical adaptive actions to increase resilience of rural communities.

Table 25: Component 7 outcomes

Project outcome	AF Desired outcome
• Water and Energy standards and policies reviewed or amended	Outcome 2:

• Desalination plants becoming the "new normal". • Rural communities happy with desalination as an alternative supply of drinking water. • Stakeholders in the rural water sector accept that small-scale desalination is a viable option to improving the quality of water supplied • Planning, design and construction of future small-scale desalination plants and hybrid power plants is simplified	Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 7: Improved policies and regulations that promote and enforce resilience measures.

Investment in tertiary students is a lifelong investment and partnerships created between institutions will persist beyond project end. Therefore, it is planned to engage with students of the academic institutions at the start of the project. The academic institutions have already confirmed their support and commitment as a partner to this project, as demonstrated in the concept proposal. Providing platforms for lessons-sharing will catalyse learning, sharing and networking, and investing in the development of a culture that supports adaptation. This will support learning beyond the project.

Students in the fields of Environmental Sciences, Engineering and Social Sciences will be formally invited to apply for participation in the project. If the response is larger than can be accommodated, a selection process will be carried out. The selected students will be encouraged to use aspects of or the complete project as a topic for their own research or to engage in research that may be identified during the project.

The project will also provide an opportunity to the selected students to do fieldwork associated with the project during the periods dedicated by the academic institutions for job attachments, field work or similar exposure. The students will be encouraged and supported to share their findings with the project team, NamWater management, the academic institutions, the media, the local community members and policy makers. To support the sharing of knowledge and lessons learned, the NamWater website will be utilised for publication.

The Knowledge Management Strategy to be developed at project inception as per the guidelines outlined in the AF Results Framework and Baseline Guidance will specifically provide for the engagement of the students.

Lessons learned throughout the life of the project will be captured in publications, case studies and as policy recommendations. Locally, presentations on progress and lessons learned will be made at existing forums. Lessons learned will also be shared nationally and internationally through national learning exchanges and participation in NIE and AF learning events.

H. Consultative process

The consultative process is fully described in the attached ***Annexure 3: Stakeholder report: Bethanie*** and ***Annexure 4: Stakeholder report: Grünau***.

For consultation it was decided to have two meetings per project site, namely one with official representatives of the councils or local authorities and one with community leaders and community members. The purpose of the consultative meetings was to

- Inform the communities of the proposed project.
- Obtain the communities' viewpoints on their existing problems and on their expectations of the proposed project.
- Better understand how environmental, gender and socials issues related to the proposed project.

1. Stakeholder identification

The first step was to identify stakeholders, i.e. determine who the project stakeholders were as well as what their key groupings and sub-groupings were. Careful identification of local peoples' representatives is an essential part of preparation for the consultation process. In selecting representatives, the following was considered:

- Who are the local officials that would be impacted by the proposed project, and to what extent do these authorities adequately represent local people?
- Who are the traditional leaders of the local peoples?
- Given that local communities are not necessarily homogenous, are there groups such as women, youth, and agricultural people who are not represented by either of the above?
- Are parallel communications needed for these groups?

Identified stakeholders were included in a stakeholder database and were notified of the relevant meetings either by formal letters, email, posters, and phone. The communities at large were informed of the meetings by posters placed at various conspicuous locations all over the villages, and a radio announcement was also sent over the local radio.

The group discussions were structured sessions facilitated by a social scientist from the company Aurecon, who prepared the attendance register, assembled background information, facilitated the group meetings, recorded the meetings and issued meeting records.

2. Meetings with representatives

The meetings were held as follows:

***Monday, 12 June 2017*:**

- Grünau Town Council Hall @ 14h00 – Community representatives such as officials, councillors, headmen and other traditional leaders.

Tuesday, 13 June 2017:

- Grünau School Hall @ 08h30 – Local business people, and members of the local community.

Tuesday, 13 June 2017:

- Bethanie Town Council Hall @ 15h00 – Community representatives such as officials, councillors, headmen and other traditional leaders.

Wednesday, 14 June 2017:

- Bethanie School Hall @ 09h00 – Community representatives such as officials, councillors, headmen and other traditional leaders.

The following draft agenda for meeting with representatives was used:

Table 26: Draft agenda for meeting with community representatives

Topic	Speaker
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater
Perception activity • Current water situation and attitude towards project	Aurecon
Discussion session • Perceived positive and negative project impacts	Aurecon
Information gathering • Vulnerable and disadvantaged groups: • Community structures and protocols	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials were utilised, as well as the envisaged outcome.

Project introduction

- Facilitation method: project overview and discussion session.
- Materials: maps and handouts with background information regarding the project.
- Outcome: to inform stakeholders about the project.

Perception activity

- Facilitation method: initiating discussion over project perception
- Meeting materials: cards
- Outcome: to obtain general knowledge and attitude towards the project

Discussion session – current issues as well as perceived project impacts

- Facilitation method: discussion session
- Materials: flip chart and pens

- Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

Discussion session – vulnerable and disadvantaged groups

- Facilitation method: discussion session
- Materials: flipchart and pens
- Outcome: to identify / name vulnerable and disadvantaged groups. To identify perceived impacts of project on groups as well as recommendations on how to include these groups as well as how these groups can benefit from project. For this project, it will be very useful to compile socio-economic information and to collect socio-economic data in advance to ensure that the stakeholder engagement activities are culturally appropriate from the outset, and that the groups most vulnerable or potentially disadvantaged by the proposed project are identified early on.

Community structures and protocol

- Facilitation method: information gathering
- Meeting materials: flipchart and pens
- Outcome: obtain names and contact details of current organisations and structures in communities (will assist with the next phases of the project). Identify protocol for dissemination of information as well as protocol to deal with grievances (current structure in communities as well as recommended for project.

Way forward

- Closing date: 20 June to provide any comments and information.
- Meeting materials: BIDs to distribute.

3. Meetings with community members

The following draft agenda for meeting with community members was used for the focus group meetings.

Table 27: Draft agenda for meeting with community members

Topic	Speaker
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater
Story telling • Current water situation: risks and impacts (positive and negative): gender, vulnerability etc.	Aurecon
Discussion session • Perceived positive and negative project impacts (construction and operational phase)	Aurecon
Information gathering • Environmental and social survey	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials were utilised as well as the envisaged outcome.

Project introduction

- Facilitation method: project overview and discussion session.
- Materials: maps and handouts with background information regarding the project.
- Outcome: to obtain general knowledge and attitude towards the project as well as any perceived risks or hazards.

Story telling

- Facilitation method: discussion over current water situation - risks and impacts (positive and negative): gender, vulnerability etc.
- Meeting materials: flipchart and pens
- Outcome: To obtain information regarding the current water situation in the area: water availability, water quality, health risks, impacts, etc.

Discussion session – perceived project impacts

- Facilitation method: discussion session
- Materials: flip chart, category cards, Prestik and pens
- Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

Information gathering – environmental and social survey

- Facilitation method: information gathering
- Meeting materials: survey, pens and clipboards
- Outcome: obtain current water situation as well as personal views, risks and issues regarding the proposed project.

Questionnaires were distributed to collected information from attendees. This was done to encourage female and those who can't express themselves in public to provide their views on the project, and for them to share their experience with the current water quality issues.

Way forward

- Closing date: 20 June provide any comments and information.

4. Outcome of meetings

The gender distribution of the delegates who attended the stakeholder engagement meetings is shown in Table 30 and the age profile in Figures 11 and 12.

Table 28: Gender of stakeholder engagement attendees

Bethanie	Grünau
43 delegates	48 delegates
27 females 16 males	26 females 22 males

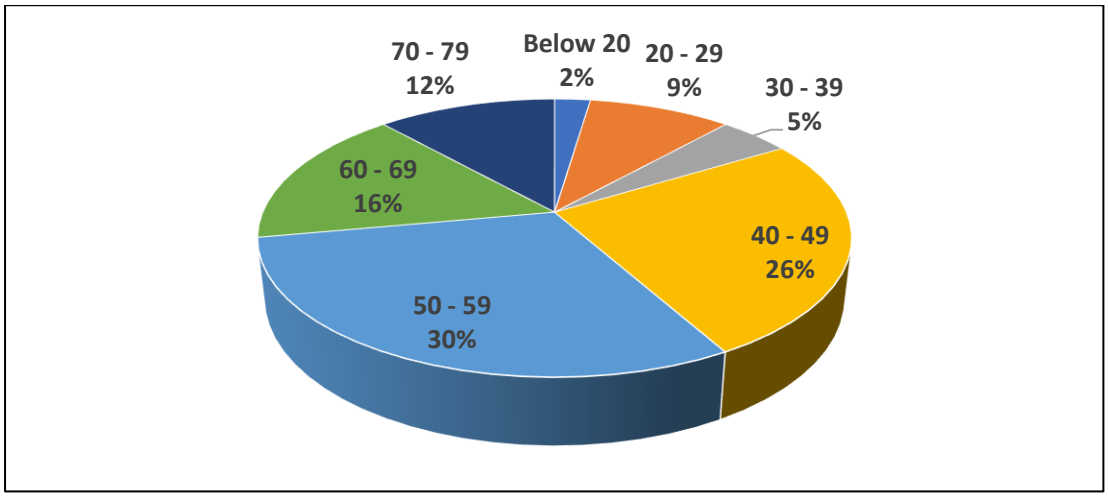

Figure 10: Age profile of stakeholder engagement attendees at Bethanie

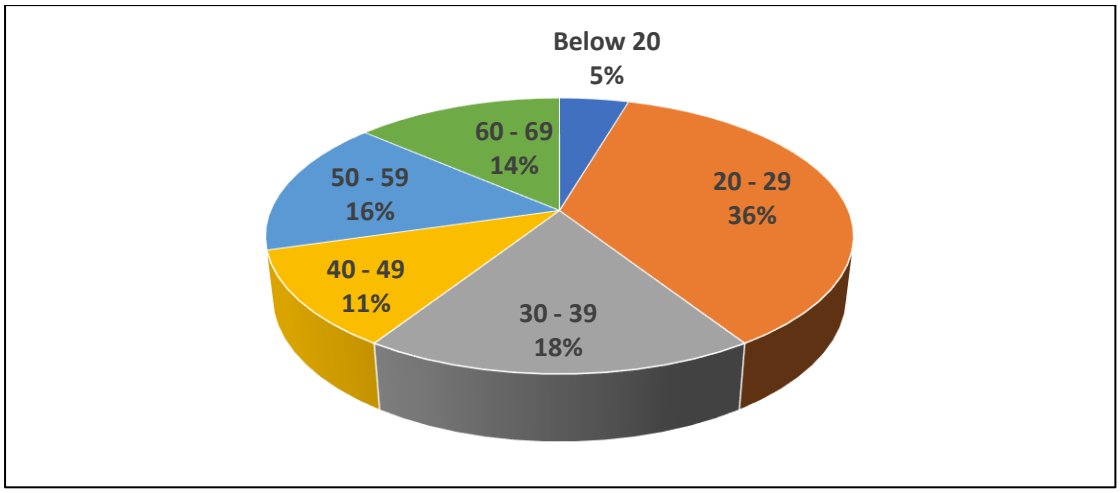

Figure 11: Age profile of stakeholder engagement attendees at Grünau

All information collected is contained in the two stakeholder reports (Annexures 3 and 4). The stakeholders welcomed the proposed project at all levels and are eager to see improvement in the quality of water and hence improvement in their livelihoods. The poor water quality affects females more than men in a health, social and financial context.

During the stakeholders meetings the following issues or challenges due to poor water quality were raised:

- The water tastes bad.
- The water is full of lime and is salty.
- Colouration of teeth.
- Loss of hair by women due to salty water

Health issues mentioned include:

- Kidney, skin and eye problems; leg and hair irritations or problems.

- Gastrointestinal disturbance and headaches.

Social issues mentioned were:

- Low self-esteem because of the brown and brittle teeth and other health issues caused by the poor-quality water. This has an impact on the employment rate and demoralises the community. It sometimes causes problems with friendships and romantic relationships; seriously impair academic and job performance; and can lead to increased vulnerability to drug and alcohol abuse in females.
- Cannot have a garden or participate in any agricultural practices because of poor quality water;
- Struggle to get laundry clean;

Financial/economic issues mentioned include:

- The water is very expensive;
- It causes a financial burden;
- Impacts on development and investment opportunities in the two areas because tourist will not visit the area due to poor water quality and investment is discouraged. Questions and comments received from the communities during the stakeholder engagement sessions are listed below.

Questions asked were:

- Will the price of water go up?
- Will the project also treat the water from the Council's borehole?
- What will happen with the brine?
- Can the brine be used for agriculture?
- Will the project provide employment for the local community?
- Will the project provide skills transfer, upliftment, and training opportunities to the community?
- Will the project provide a more constant water supply?
- Will NamWater provide a water tank closer to the settlement?
- Will the project also be able to supply back-up power for the settlement?

Comments made were:

- The project must put in place measures to make sure the plant is secured and protected against vandalism; inner electrified fences suggested.
- The community is in favour of this project and welcomes any project that will improve their lives.
- They hope that the project will open the door to other projects and investment opportunities in the town. For example; the upgrade of the road north of Bethanie to bitumen standard; providing of recreational facilities; tourism services and agricultural opportunities.
- The hope is there that the project will bring relief and upliftment to the settlement, such as reliable water supply, flush toilets, and other opportunities.

I. Justification for funding requested

This funding is being sought to improve the resilience of communities living in small, remote towns and villages in Namibia by improving the quantity and quantity of the assured water supply from local groundwater sources. As shown above, the cost of conventional water supply (i.e. by pipelines) from the nearest bulk water point with adequate quality, is significantly higher than the cost of the proposed solution using renewable energy. Furthermore, solar energy is an abundant resource in Namibia and is currently under-utilised especially in these scenarios.

The project aims to demonstrate that this type of water supply problem can be addressed by means of a desalination system using hybrid wind- and-solar driven commercially available technology components. The successful outcome of the small desalination plants could also provide a solution to some wastewater outflows of water treatment and small sewage works in other parts of Namibia, to improve the re-use and/or safe disposal of waste waters. The project components were justified as follows:

COMPONENT 1 : the development of Pilot Desalination Plants at Bethanie and Grunau

The assistance of the AF is crucial as due to fiscal contraints, severely minimising the chances for utilisation of desalination as an option. Currently, under the baseline scenario, there is information available that concept desalination projects do exist in Namibia on a micro-scale for the settlements of Amarika and Akutsima in the Omusati Region only, with capacities of up to 3 m^3 of water per day. These plants are demonstration and research plants provided to test multiple desalination methodologies such as flash and RO in a very limited, scientific manner. Sadly, even though they are research projects, all the information exists with external international parties and no access is available to local institutions. This is typical of top-down approaches which in this case lacks any link to the commercial and very public nature of water provision and operations. Thus, it's fair to say that no other plants exist in any other part of Namibia and especially not in off-grid areas.

Adaptive Contribution: without a doubt, the impact of this project will be gained through effective interaction of the plant operation and its practical application. Further, the community will have close contact with the technology as it will be located in the supplied community. This technology contributes to adaptation in following ways;

- Better understanding of RO technology application in the desalination process.
- Building knowledge of larger systems for use as public water supplies
- Diversification of water supply by providing alternative or supplementary sources of water when current water resources is inadequate in quantity or quality
- Resilience to water quality degradation

COMPONENT 2 : Hybridized Renewable Energy Plants at Bethanie and Grunau to supply sustainable power for Component 1.

Currently there are no public water supplies provided by desalination or that are driven by renewable energy to support the desalination process. Business as usual would have either the national grid or diesel-powered generation as the energy source for desalination.

This then would place an even higher burden on Namibia's import of electricity (which currently stands at around 65%) and or its import of fossil fuels such as coal and heavy fuel oil (HFO)

for the local utility generation, or directly imported diesel oil for local dedicated diesel generators connected to any facility providing RO desalination.

Adaptive Contribution: Reduction or mitigation of the greenhouse gas (GHG) impact of the desalination process is well known and accepted. Namibia is well endowed with solar radiation which is still largely under-utilised along with Wind resource availability dependent on location and timing.

This situation favours combining renewable energy with water abstraction to improve resilience against water shortages brought on by climate change. It therefore contributes to;

- Sustainable and climate resilient renewable energy power supplies.
- Increased knowledge of solar and wind system performance for desalination activities
- Reduction or even elimination of reliance on GH producing power generation.

COMPONENT 3 : Testing and commissioning of plants at Bethanie and Grünau, and training

Baseline for skills and knowledge of desalination systems and the operation of renewable energy plants is very limited or even non-existent depending on the view-point taken. The knowledge and skills base for desalination systems driven by RE is currently non-existent within NamWater and the affected stakeholder entities.
The communities targeted and the future communities across Namibia that can be impacted do not currently possess the adaptive capacities to climate change. Institutions contained or impacting on these communities also in this context lack the ability to effectively combat climate change.

Adaptive Contribution: as the utilisation of a purely technological approach would and is futile, the attention to soft issues is extremely relevant to ensure increased ability for success. Training and skills transfer efforts help to raise the adaptive capacity of the authorities, which is an important component of resilience.

This component contributes by;

- Strengthened institutional capacity
- Improving and increasing the knowledge and skills of persons responsible for water management and delivery.
- Diversifying knowledge of water delivery methods
- Increasing local capacity
- Improving local interaction

COMPONENT 4 : Pilot Phase Operation

In terms of a baseline, no such plants exist and *Pilot Phase* operation makes sense when it is clearly accepted that no such plant exists in the Southern Africa region and definitely not in Namibia. Replication is the ultimate goal to increase the adaptive capacity country-wide thus a clear understanding of all aspects need to be understood and documented which will take place during this component.

As also pointed out, the stakeholders with responsibility for water provision do not have the capacity and expertise to support and scale up desalination systems or desalinations systems driven purely by renewable energy.

Adaptive Contribution: This Component will provide the required tangibility and confidence required for replication once the process is completed. It is therefore very important to provide knowledge and experience related to plant operation, maintenance, community responses, system resilience and lessons learnt.

This component contributes to adaptation in following ways;

- Knowledge and skills related to operation of commissioned desalination plants
- Desalination plants operated solely from renewable energy supplies (wind and solar).
- Information gathering, information compilation and data-basing along with analysis reports
- Community engagement and consultations (*see Component 5*)

COMPONENT 5 : Supply good quality water to the communities at the two project sites during piloting of the plants

This Component 5 will run in parallel with Component 4.

Adaptive Contribution: This Component will also provide the required tangibility and confidence required for replication once the process is completed. It is therefore very important to provide knowledge and experience related to plant operation, maintenance, community responses, system resilience and lessons learnt.

This component contributes to adaptation in following ways;

- Knowledge and skills related to operation of commissioned desalination plants
- Information gathering, information compilation and data-basing along with analysis reports
- Community engagement and consultations

COMPONENT 6 : Sensitisation of beneficiaries and stakeholders

Adaptation understanding in Namibia is still in its infancy while Mitigation is more widely understood although from a point of energy efficiency rather than climate change. The education literacy rate of 89% and unemployment rate of 34% does not convert to the required awareness understanding of climate resilient actions. Community interaction however is still an active vehicle for information dissemination and so the “localized” approach will be adequate to help reduce “climate resilient ignorance”.

Currently, very little or no awareness raising activities occur around desalination in Namibia. The little information available to the public and that has been provided by others is still to filter down effectively to the policy makers, officials and even the average citizen.

Adaptive Contribution: This component will provide a platform for information and knowledge sharing to stakeholders on desalinated water impacts and benefits towards increasing their adaptive capacity to the impacts of climate change. Accrued benefits align with national development plans increasing youth and gender empowerment and increased participation.

Sensitisation of local communities is an important part of the project, so that there is acceptance of the inevitable different taste and hardness of the water. It is also expected that consumers who have learned about the system behind the ‘new’ water will be more likely to discuss it with pride, thereby helping the wider uptake of renewables as well.

This component contributes to adaptation in following ways;

- Increased awareness of adaptation
- More people introduced to desalination processes and renewable energy driven desalination processes.
- number of persons in the affected communities accepting desalinated water.
- Sustainable water demand understanding in the use of desalinated water.

COMPONENT 7 : Information and knowledge dissemination

No capacity and or expertise currently exists at the local level on desalination or desalination systems driven by renewable energy. As with *Component 5*, no baseline exists currently and so any incremental learning passed on will be extremely beneficial.

Adaptive Contribution: From the lessons learnt, mainstreaming towards practical adaptive actions to increase resilience of rural communities will be expected. The Component will assist the project which is designed to support the Government of Namibia via its executing entities in the water sector to address specific needs to advance adaptation at all relevant levels (national, sectoral, local), involving all relevant stakeholders (government, NGO, private sector).

An informed decision maker will result in improved planning, management and efficient use of water resources. This will not only contribute towards meeting the immediate demand for reliable freshwater but on the long term also ensure the sustainable use of the limited water resources in a context of increasing climate risks. An improved, more resilient, supply of freshwater will benefit vulnerable communities.

This component contributes to adaptation in following ways;
- Best practice understanding
- Water and Energy standards and policies reviewed or amended
- Desalination plants becoming the “new normal”.
- Rural communities happy with desalination as an alternative supply of drinking water.

J. Sustainability of project outcomes

1. Sustainability ensured by the policy / legal framework

Namibia as a Non-Annex I Party to the United Nations Framework Convention on Climate Change (UNFCCC) does not have commitments under the Convention. However, Namibia takes climate change issues seriously and has submitted an Intended Nationally Determined Contribution (INDC) as a clear testimony that the country is committed to fight climate change (Government of Namibia, 2015).

In conformity with decisions 1/CP.19 and 1/CP.20 of the Conference of the Parties, the Republic of Namibia should submit its Intended Nationally Determined Contributions (INDC) to the United Nations Framework Convention on Climate Change towards achieving the ultimate objective of the Convention as was set out in Article 2 before the 01 October 2015. To this end, Namibia has put in place policies and strategies to deal with the adverse impacts of climate change.

Namibia's *Second National Communication* to the UNFCCC proposed that adaptation to climate change in the water sector should focus particularly on measures to reduce evaporation (conjunctive use of surface and ground water) and to enhance the efficiency (through water demand management) of the utilisation of water resources.

Namibia's *Third National Communication* to the UNFCCC emphasises the continuation of these points including the promulgation of the Regulations under the Water Resources Management Act, 2013.

In response to needs identified and active climate change policy and mainstreaming, the following Water and Climate Change Policies apply;

- National Water Policy 2000
- Water Supply and Sanitation Policy 2008
- Integrated Water Resources Management (IWRM) 2010
- National Policy on Climate Change for Namibia 2011
- Water Resources Management Act, 2013
- National Climate Change Strategy and Action Plan 2013 – 2020

Because of water scarcity and increasing demand from all sectors, Integrated Water Resources Management (IWRM) has also been identified as essential for the management of the Water Sector in Namibia (IWRM Joint Venture - Namibia, 2010). IWRM was recognised as an important link that was missing in the management of the Namibian water sector.

NamWater manages many groundwater schemes across Namibia. The newly proposed water quality standards mean that many of the NamWater schemes do not comply with the required standards. This brings an imperative to urgently find ways to improve groundwater quality at an affordable cost. The project achieves this requirement, and the necessity to comply with the law will bring its own incentive to NamWater to ensure that the systems continue to deliver.

As shown, the project conforms with Namibia's policy framework for adapting to climate change. A strong factor pushing greater application of renewable energy is Namibia's White Paper on Energy Policy and the looming shortages in electricity, which will be experienced in Namibia and other Southern African countries.

2. Sustainability ensured by the institutional framework

The project will contribute to the main objective through the following outputs:

The institutions that will be directly responsible for maintaining the infrastructure and the functionality of the systems are NamWater and the respective Village Councils. To facilitate continuous and problem-free delivery of water, the supply schemes are daily inspected and maintained by on-site contractors. At each town, there are two people contracted for this work, so that if one is away, the tasks are carried out by the other. This arrangement will be kept in future, so that there will be a physical presence of responsible staff to respond to any problems that arise.

Table 29: Component 7 outcomes supporting sustainability

Project component	Project outcome	AF outcome
Information and knowledge dissemination from the lessons learnt are mainstreamed as practical adaptive actions to increase resilience of rural communities.	• Water and Energy standards and policies reviewed or amended • Desalination plants becoming the "new normal" • Rural communities happy with desalination as an alternative supply of drinking water	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses Outcome 7: Improved policies and regulations that promote and enforce resilience measures

Capacity for sustainability

Capacity in the responsible institutions will be raised during the implementation of the project, especially through the training component. The training will obviously include the on-site contractors for ongoing maintenance. Overall, the training to all involved officials will help to ensure that there is institutional memory, and skills on the ground to maintain the systems. Knowledge that is generated through this project will be acquired by officials in NamWater and the respective Village Councils, which all have permanency in the institutional framework for water delivery. The records created during the planning, construction and operational phases, with the involvement of students from academia, will help to ensure that the information is available for future application.

3. Economic and social factors ensuring sustainability

The project intends to prove that a small-scale desalination system powered by renewable energy is economically viable, especially in remote regions. If it is successful, similar plants will be established at schemes where improvement in water security is required, or will become necessary as climate variability increases. This will improve the water security of the communities in those towns, and reduce the cost of water supply compared to implementing the conventional yet more expensive technology. These are strong economic and social motivations for continuing the further roll-out of the technology. In addition, promotion of the system to the public through various media, such as articles in the media and magazines, will help to bring popular support for wider application.

Even if the economics are demonstrated to be not strongly favourable, the technology is likely to find application in remote places, where there simply is no grid electricity to power a water treatment process.

4. Environmental factors assisting sustainability

Globally, any project that brings development with a significantly reduced carbon footprint, is environmentally preferred. This factor adds to the positive impacts of the project, and helps the justification for maintaining the system so that environmental damage is prevented. Component 2, development of hybrid renewable energy plants at various locations to supply sustainable power for Component 1, is addressed in the table below.

Table 30: Component 2 outcomes supporting sustainability

Project Desired Outcome	AF Fund Desired Outcome
• Sustainable and climate resilient renewable energy power supplies • Increased knowledge of solar and wind system performance for desalination activities	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.

K. Environmental and social impacts and risks

To ensure that the proposed project for Bethanie and Grünau areas have minimal impact to the environment and people living in the area, risks or impact associated with projects were identified. The risks were identified and mitigatory recommendations were outlined in the Environmental Social Management Plan for each site (Annexures 6 and 7). The potential environmental and social risks were identified for the different phases of the projects such as: Construction phase, Operational phase and Decommissioning phase. However, before the identification of the risks or impacts, the proposed projects were screened to ensure compliance with the Environmental and Social Policy of the Adaptation Fund, with the focus on relevant key points in the policy. Furthermore, the identified risks were also aligned with the Adaptation Fund Environmental and Social principles.

The environmental and social impacts or risks associated with the proposed project at the proposed two sites are highlighted below. The potential risks are screened against the Environmental and Social Policy of the AF and against the Environmental and Social principles. Detailed information pertaining to how the identified risks or impacts will be managed on site, the responsibility of various parties involved and grievance mechanisms in case concerns arises are all contained in the Stakeholder Engagement Reports (Annexures 4 and 5) and the Environmental and Social Management Plan (Annexure 7) of the proposed two sites.

The table on the next page indicates the environmental and social risks for each of the Environmental, Social and Gender principles.

Table 31: Environmental, social and gender risks

No	Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
1	*Compliance with the Law (include gender)*	The project comply with the following Namibia's Law: Environmental Management Act (EMA) (2007). • *The Constitution of the Republic of Namibia (1990)* • *Namibia Vision 2030* • *National Climate Change Strategy & Action Plan 2013 – 2020* • *Water Resources Management Act (Act no. 11 of 2013)* • *Water & Sanitation Policies* • *Forestry Act (Act 12 of 2001), As Amended* • *Soil Conservation Act (Act 76 of 1969), As Amended* • *Pollution Control and Waste Management Bill (in preparation* • *Atmospheric Pollution Prevention Ordinance (No.11 of 1976), As Amended* • *The Public Health Act (Act no 36 of 1919)* • *The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS* • *The Labour Act (Act no 27 of 2004)* • *National Gender Policy (2010 – 2020)* • *Code of Practice: Volume 2 – Pond Systems (2008)* • *Guideline for disposal of solids from water and wastewater treatment processes (2012)* • *National Policy on Climate Change for Namibia (2011)* Permits will be required for the disposal of the brine from the treatment plant and removal of any protected trees. Application for the brine disposal permit to the Ministry of	**NONE**

		Agriculture Water and Forestry who are supporting this project as per attached letter of support will me executed by NamWater.	
2	*Access and Equity (include gender)*	The water provided by the project will be distributed through the normal system managed by the relevant Village Councils. No residents will be denied access to the service that is provided. Women and children are identified as being vulnerable to climate change impacts (MET 2015). All consumers served by the project will be subject to the tariff system managed by the relevant Village Council or Regional Council. This follows a 'rising scale', where a minimum amount adequate for health and sanitation is provided at a basic fee. Consumers who use more (according to set thresholds) pay for the water at higher rates. This is part of the demand management system which seeks to provide a minimum amount of water for basic needs at an affordable fee, while curbing excessive use with higher fees.	**LOW**
3	*Marginalized and Vulnerable Groups (include gender)*	The project will not impose adversely impact on marginalised and vulnerable people in the selected areas. Displacement of people will not happen as NamWater existing land will be used and if extra land will be required NamWater will follow the procure of consulting with the relevant bodies e.g. Local Authority to acquire the land. The project will provide resilience opportunities for indigenous people by creating employment opportunities which will consider	**LOW**

		marginalised and vulnerable groups because of their previous disadvantage status. Given the nature of the project, gender awareness will be mainstream in the entire project to ensure the equal participation of both genders in decision making more especial women and children. The risks under this principles are low in nature will be managed by implementing the provided mitigation measures.	
4	*Human Rights (include gender)*	The project will empower communities in the project areas to exercise their human right as underlies in the Namibia's Constitution, Vision 2030 and the Environmental Management Act. The project will not violate any human right of the community members	**NONE**
5	*Gender Equity and Women's Empowerment*	The proposed project components and its activities will be planned, implemented and monitored by a public entity and fair and equitable gender representation will be implemented. As it is a national priority, effort will be made to ensure equal participation of women in the decision making of the project. Structural gender inequalities embedded in our society - unequal access to and control over material and non-material resources, assets and opportunities. The structures which organise the division of labour will ensure that no discrimination occur because of gender.	**NONE TO LOW**

		The project will also provide capacity building and training and skills transfer to women in the project area for sustainable livelihood generation.	
6	*Core Labour Rights (include gender)*	The project will ensure full compliance to the labour act and all labour related matters being it wages, recruitments etc will be conducted as per the labour act. The project will by no means violate the labour act.	**NONE**
7	*Indigenous Peoples*	Indigenous people such as San, Himba and Zemba are the most marginalized groups in Namibia. In Namibia, indigenous people are defined as those people who have special attachment to their land, who are marginalized, disposed and discriminated against. To date, indigenous people such as the San remain the landless and have yet to reap the benefit of democracy. Although indigenous people have formal right to participate, thy have no influence over national issues and rarely consulted on issues affecting them directly. It should be noted that these people have been subjected to unequal treatment and discrimination over many years and therefore special consideration of empowering them should be made in the proposed project to complement the special program which the government is currently undertaking. Furthermore, the Constitution of Namibia provides legislative and normative framework for the protection of indigenous minorities. These legislative and normative framework should be	**LOW**

		followed or consider in the proposed project to ensure the acceptance and success of the proposed project. The selected areas for the project is mostly inhabitant by the San and Damara people. The project will ensure that this people are included and consulate for this project.	
8	*Involuntary Resettlement*	No resettlement will be needed in the pilot projects or because of the project.	**NONE**
9	*Protection of Natural Habitats*	Integrated in the project design to ensure that the natural habitats is protected during the implementation of all the project components. The project will ensure that the natural habitat is protected by complying with law mentioned in principle 1. At this stage it is envisage that the project will pose no risks to the natural habitat since the area which will be used to implement most of the project components is already disturb or have existing water supply infrastructure which belong to NamWater. For the selected project sites with existing infrastructure environmental clearance certificate were already obtained. In addition, the proposed project components concept design was also issued with an environmental clearance certificate which the findings will be validated once the detailed design is completed.	**LOW TO MEDIUM**

		Any component implementation that will pose threat to the natural habitat after the completion of the design will be implemented in compliance of the Environmental Management Act of 2012.	
10	*Conservation of Biological Diversity*	Integrated in the project design to ensure that the flora and fauna are protected from any adverse impact during the implementation of the project components. The proposed project sites are already disturb and have environmental clearance certificates. The ESMP will be used to ensure the protection of biological diversity. At this stage, it is envisage that, the project will not cause any harm to the biological diversity if the mitigation measures will be implemented.	**LOW**
11	*Climate Change*	The project is proposed to increase the adaptive capacity of the communities in the selected areas to the effect of climate change which is affecting water quality and reducing water supply. The project components will not introduce GHG in the atmosphere to contribute to the climate change, but rather uses renewable energy which is a mitigation measure to climate change.	**NONE**

12	*Pollution Prevention and Resource Efficiency*	Integrated in the design of the project that, the waste which will be generated from this project is managed in compliance with the law mentioned in principle 1. The project will generate brine which will be kept in sealed evaporation ponds to minimise leakages to ground water and thus contamination. Appropriate monitoring program of the waste generated from sites will be implemented in consultation with relevant stakeholders. Moreover, disposal permits for the brine will also be obtained from the Ministry of Agriculture Water and Forestry once the detailed design is completed as a requirement for issuance of the permits.	**LOWO TO MEDIUM**
13	*Public Health*	The project is aimed to improve the quality of water which is currently not suitable for human consumption. The health of the communities' members in the selected area will improve after the implementation of the project. At this stage, the current quality of water supplied to the communities members is causing a lots of health related issues. The project will not pose any impact on the health of the public.	**NONE**

14	*Physical and Cultural Heritage*	No adverse impact related to cultural heritage have been identified. However, care should be taken if/when sites and objects (historical sites, historical artefacts, rock art sites, ruins, fossils and archaeological objects etc) protected by the law are encountered that these are reported to the National Heritage Council of Namibia as prescribed by this Act.	**NONE**
15	*Lands and Soil Conservation*	Restoration activities will helps land and soil conservation of sites during construction phase. The project will ensure that the removed land or soil during construction is retain to its natural states and re-vegetated when necessary.	**LOW**

In view of the environmental and social risks mentioned, the principles in the above table most of them have **NONE-LOW** and **LOW TO MEDIUM** risks arising from the projects components and its activities. Low and mediums risks were identified in the principles below and the project is classified as **category B project**:

- Access and Equity
- Marginalized and Vulnerable Groups
- Gender Equity and Women Empowerment
- Conservation of Biological Diversity
- Protection of Natural Habitats
- Indigenous Peoples
- Pollution Prevention and Resource Efficiency
- Lands and Soil Conservation, Water Supply

The implementation of the project is expected to provide benefits to these communities by improving their health and thus their adaptive capacity to the effect of climate change which is affecting and projected to effect the quality of water further if nothing is done. In view of the project being categorized as a **category B project**, an Environmental & Social Management Plan (ESMP) is proposed and given in **Annexure 7.**

Currently the project is based on a concept technical design, which will be followed by a detail design when project implementation starts. The assessment conducted to identify the environmental and social risks and the development of the ESMP was based on the concept design, and findings from the assessment will be validated once the detail design is completed. If further specialist environmental study is required after completion of the detail design, NamWater will be obliged to carry out such studies as they normal do with other water supply projects.

The environmental scoping assessment and management plan for this proposed project was submitted to the Ministry of Environment and Tourism is in compliance with the Environmental Management Act, 2012 and an environmental clearance certificate was issued for the project concept design (See attached). It is also worth noting that the proposed areas where the piloting will take place already have water supply infrastructure and NamWater already has existing valid environmental clearance certificates for these water schemes. (See attached). Furthermore, the boreholes used at these schemes also have water abstraction permits which is in compliance with the Water Resources Management Act, 2013.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Project management

1. Institutional level

The Desert Research Foundation of Namibia (DRFN) is accredited as the NIE for Namibia, and is contracted by the AF to execute an oversight role for project implementation in Namibia. The NIE bears full responsibility for overall project management, monitoring and evaluation, including financial monitoring, and reporting responsibilities associated with the project. Some specific roles and responsibilities of the NIE include, *inter alia*:

- Advise and oversee project implementation
- Liaise with and report to AF
- Establish protocols for annual progress reporting
- Facilitate formal scheduled project evaluations
- Ensure compliance with the ESP of the AF, and other essential operational frameworks
- Disburse funds to the EE and monitor expenditure

The EE (NamWater for this project), through its Project Steering Committee (PSC), will inform the NIE on project performance through submission of quarterly reports. The EE and NIE will meet to discuss these reports within one week after the reporting period. The two entities will endeavour to maintain effective communication flow and will undertake *ad hoc* consultations as a routine operational procedure.

The EE will be responsible for financial management of the project. Procurement of goods and services will comply with the Procurement Policy of NamWater. All tender documents and recommended award of tenders will be submitted to the NIE for approval to ensure that internationally accepted procurement principles and practices are applied.

Implementation will involve stakeholders from government, local communities, business and civil society. The management arrangements of the project have been designed to provide for coordination and close collaboration among project partners and key stakeholders, and wherever possible, alignment with other ongoing initiatives and programmes of work.

Regular feedback and communication on progress with project implementation on the project level will be maintained through the Project Management Team (PT) reporting structures, and through the task teams that will be established at constituency and project level.

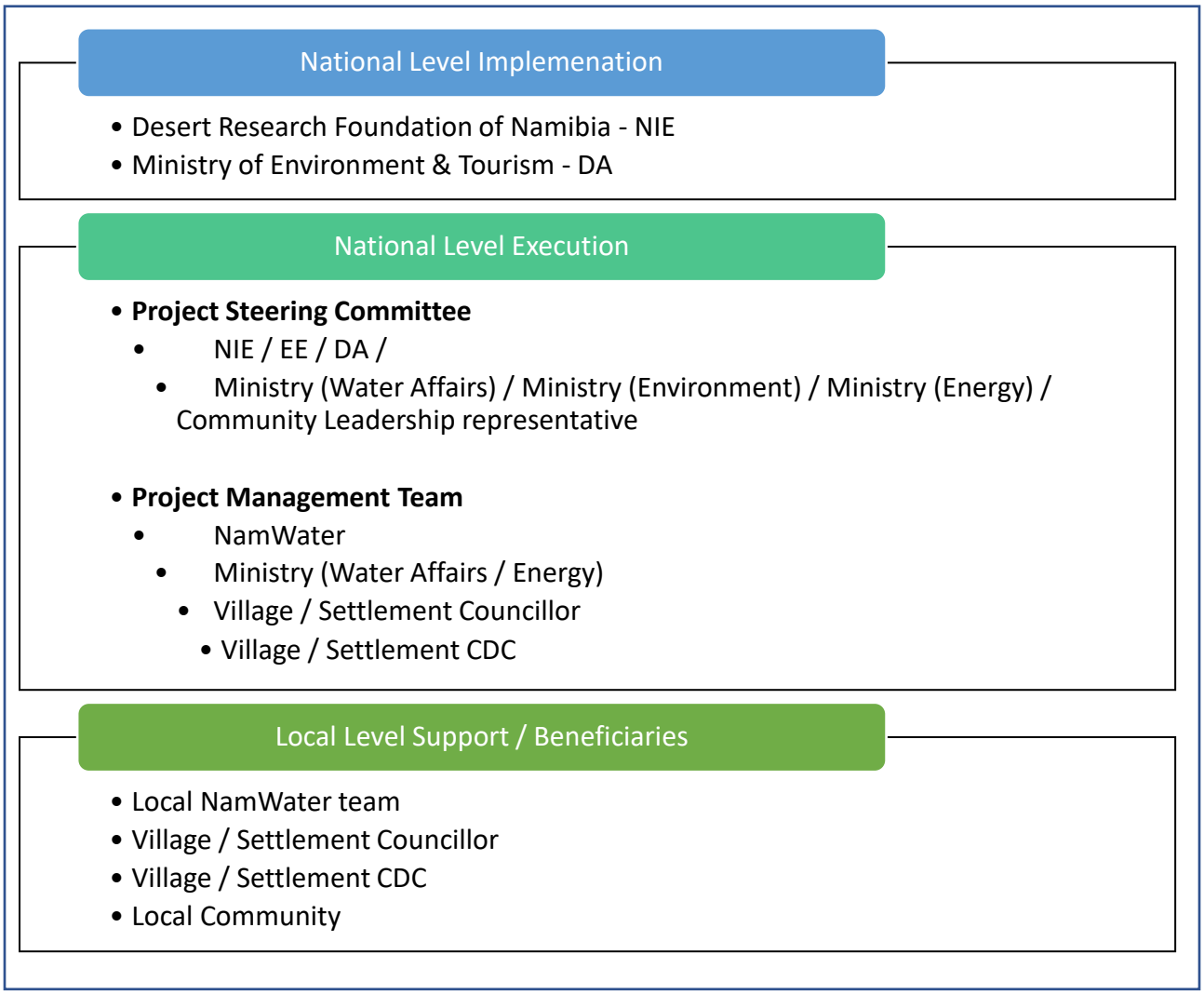

Figure 12: National and institutional project implementation design

Oversight of project activities will be the responsibility of the Project Steering Committee (PSC) which will be accountable to the NIE. This will include a focus on social and environmental risk management and execution progress. NamWater will take responsibility for establishing and maintaining the PSC based on a Terms of Reference which will be negotiated at project launch. It is envisaged that the Head: Program Management, or his or her delegate, will serve as the Chair for the PSC.

The PSC will include key partner institutions, NamWater, WML, NRGen, CRSES, NUST, representative of the local authorities at Bethanie and Grünau that will support project governance and ensure coordination and integration across relevant partners. As a matter of principle, the project will work with and strengthen existing coordination, decision support and learning structures where these exist.

The PSC has the following functions:

- Accountable to NIE to ensure overall compliance with the spirit, policies and procedures of the AF.
- Setting up and oversee the project review process, including guiding the development of terms of reference for reviewers, setting up the review panel, and considering the recommendations of reviewers.
- Ensuring appropriate linkages with AF criteria and facilitating appropriate consultation with and, where necessary, endorsement from relevant spheres of government. From time to time this may involve promoting agreement on the roles of relevant institutions in implementing AF projects and facilitate the resolution of disputes among project partners.

NamWater will report any unintended social and environmental risks that are detected through the project monitoring, evaluation and reporting processes to the NIE via the PSC, together with a proposed risk management plan that shows how these risks will be mitigated. In response to this, the NIE and PSC may propose the redirection of project funds to risk management activities, or the withholding of the next tranche of payment until satisfactory risk management actions are determined and agreed.

Project stakeholders will be made aware of the project's grievance procedures should they wish to raise any issues and concerns, including those related to project risk management

2. Executing level

NamWater is the EE for the project with overall responsibility for project implementation over the three-year period and will thus stand accountable for both project and financial management.

NamWater was established in 1998 by the Namibia Water Corporation Act No 12 of 1997, an act of the Namibian Parliament. In term of the said act, the objects of the Corporation shall be to carry out efficiently, and in the best interests of the Republic of Namibia -

- the primary business of bulk water supply to customers, in sufficient quantities, of a quality suitable for the customers' purposes, and by cost-effective, environmentally sound and sustainable means; and
- the secondary business of rendering water-related services, supplying facilities and granting rights to customers upon their request.

As EE, NamWater will sign the grant agreement with the NIE and will be accountable to the NIE for the disbursement of funds and the achievement of the project objective and outcomes according to the approved work plan. In particular, NamWater will be responsible for the following functions:

- coordinating activities to ensure the delivery of agreed outcomes;
- certifying expenditures in line with approved budgets and work-plans;
- facilitating, monitoring and reporting on the procurement of inputs and delivery of outputs;
- approval of Terms of Reference for consultants and tender documents for sub-contracted inputs in compliance with the NamWater Procurement Policy

- reporting to the NIE on project delivery and impact;
- and monitoring compliance with the AF.

A separate project account will be opened in Namibian dollars with the First National Bank of Namibia, a financial institution that has been providing banking services to NamWater since inception in 1998. This will provide that all tranches for the project can be deposited directly into this account and all costs related to this project can be claimed from this account on a monthly basis. This separate bank account will be included in the annual organisational audits of the EE and the NamWater financials system will also be available for an audit if required.

3. Project level

At the project and component levels, Task Teams will be established to support local-level coordination and governance (for the former), and technical integration across partner organisations and with related initiatives and ongoing programmes of work (for the latter).

The Task Teams will be as follows:

- Environmental and Social Task Team;
- Engineering Design Task Team;
- Operation and Water Quality Review Task Team; and
- Capacity Building and Learning Task Team.

The PSC, PT and Task Teams will ensure that the project is appropriately linked to local (constituency), local authority, regional and National structures. Strategic and operational oversight will be ensured by the NIE.

The project will be managed by a Project Manager (PM) leading a Project Team (PT) that is housed within NamWater and reports to the NamWater Program Manager. The PT will be responsible for providing technical leadership to the project, managing and coordinating project activities, reviewing quarterly forecasts and risk assessments and providing oversight on the day to day operations of the project including procurement, financial management and reporting, communications, monitoring and evaluation of project performance, reporting and serving as secretariat for the PSC.

The PT will be led by a Project Manager and assisted by a Supply Chain Manager (part-time) and Project Accountant with representatives from each technical discipline. The functions of the Project Manager

Indicative Terms of Reference for the Project Manager:

- Provide strategic leadership to the implementation of the Project.
- Ensure management of all project management processes, deliverables, finances, procurement and contracting of service providers.
- Ensure compliance with NIE and AF requirements, including ensuring effective procurement, administration, reporting, disbursement and financial management procedures.
- Ensure the coordination and effective implementation of project activities, through effective governance structures.

- Build relationships with the Ministry of Agriculture, Water & Forestry, and local and regional government ministries to sustain and replicate project outcomes, and to capture these in ongoing and future policy processes.
- Manage relationships with a diverse range of partners and stakeholders (private sector, public, sector, NGOs and academic), resulting in their continued mobilisation and support of the project.

A Gender and Social Expert will from part of the Environment & Social Task Team, and will work closely with the other project partners to ensure that there is equitable representation of women and other vulnerable groups as project beneficiaries, in training and capacity-building programmes, and in project decision-making structures at all levels. The Gender and Social Expert will be responsible for developing a Gender and Social Action Plan (GSAP).

This will include:

- a rapid assessment undertaken in beneficiary communities;
- indicators and targets regarding the inclusion of vulnerable groups in project activities, training, representation on project structures and receipt of project benefits;
- measures to ensure transparency, fairness and equity in selection processes for project benefits; and
- measures to encourage and support the participation of identified vulnerable groups and individuals in the various project activities; training/building the capacity of implementing partners to incorporate gender and social concerns into their work on the project; playing an ongoing advisory role to these partners during the 3 years of project implementation; ensuring compliance with the project's Environmental and Social Risk Management Plan; and monitoring the progress on achieving project targets relating to gender and social indicators.

Most project staff will be assigned to the project for a period of maximum 3 years periods with release periods in between when their inputs are not required, however, the Project Manager will update them on regular intervals regarding the progress of the projects. The Project Manager, Supply Chain Manager and Project Accountant will be assigned for a longer period to allow for project closure. The Project Manager will report directly to the Program Manager within NamWater, who will be responsible for providing day-to-day supervision of the Project Manager. NamWater will provide suitable office space for all NamWater project staff on full-time service contracts, as well as the necessary office furniture and support services. The NamWater Enterprise Resource Planning system (ERP), SAP PS, will also be utilised as the project accounting system for the project which has the added advantage that the project financials are subject to the annual external audit.

Core project staff will be trained to ensure compliance with AF policies and procedures. Focus will be placed on ensuring that NamWater and other project partners are able to competently detect environmental and social risks in future project planning, monitoring, evaluation and reporting processes. All project staff will be assigned to the PT in terms of their responsibilities and functions within the respective partnering institution. It is not planned to appoint any staff member outside of the partnering institutions.

B. Financial and project risk management

DRFN will have an overarching role as the NIE in overseeing and ensuring financial and project risk management. These risks, and associated mitigation/management measures, will be assessed on an ongoing basis. The following risks, their potential impacts, and proposed responses in mitigation/management are as follows:

Table 32 Risks, impacts and mitigation

Risk	Level	Management/Mitigation
Financial		
Ineffective Financial Management Systems	Low	The following measures will mitigate the risk: (i) The separate bank account with FNB for the project will ensure that project funds received are clearly separated from NamWater funds. (ii) NamWater will formally claim expenses on a monthly basis from the FNB account supported by recorded actual expenses. (iii) All service and goods will be procured in compliance with the NamWater Procurement Policy. (iv) The NamWater project expenses will be subject to the normal internal and external audit.
Delays in the disbursement of funds, procurement and institutional inefficiencies (e.g. lengthy approval processes) result in delayed delivery of equipment and other services and hence project implementation.	Low	The NIE and NamWater will work closely to ensure optimum conditions for timely disbursement of funds contracting, monitoring and financial reporting. The Project Manager and Supply Chain Manager will develop and regularly update a Procurement Plan in line with NamWater guidelines. Key project staff will be in place prior to the project inception meeting.
Fluctuations in exchange rate (USD: NAD) which could affect the funding available for implementation and lead to budgetary constraints.	Medium	The Project Accountant will closely monitor the USD: NAD exchange rate and communicate any implications to the Project Manager so that project management can be adaptive. NamWater will collaborate closely with the NIE should exchange rates fluctuate to the extent that budget reallocations are required. In this event, budget reallocations shall be made in such a way that the achievements of project outcomes are compromised as little as possible.
Ineffective management of project funds affects project implementation.	Low	A Supply Chain Manager and Project Accountant will be assigned to the Project Team to ensure appropriate management of project funds. In addition, NIE oversight and account audits will ensure that there is no ineffective use of project funds.

Risk	Level	Management/Mitigation
Project		
Failure to achieve milestones and provide deliverables on time	Low	A dedicated NamWater project manager will be appointed to manage the project to ensure adequate project planning, coordination and integration of all activities to prevent time frame overruns.
Long distances to the sites results in logistically challenging implementation of project interventions.	Medium	Access to Uis and Bethanie was considered as one of the criteria when selecting project sites. The road to Uis consists of 211 km of tarred road and 122 km of gravel road. The road to Bethanie consists of 644 km of tarred road. Whilst the accident rate on Namibian roads is at an unacceptable high level, the following mitigation measures will apply for project staff to do site visits: (i) Driving after sunset and before sun rise will not be permitted. (ii) Motor vehicles used for driving must be roadworthy and in good condition. (iii) Drivers of motor vehicles must be in possession of a valid driving license issues by the Namibian Authorities. (iv) Drivers must comply with all traffic rules, with specific reference to the speed limits on these roads. (v) It will be expected from drivers to rest for at least 10 minutes after driving of a period of 2 hours.
Failure to involve adequate representation of vulnerable communities, particularly women, and therefore failure to create ownership of the project at the community level at project sites.	Low	The project will avoid a „top down" approach and create community ownership of the project interventions by building the capacity of community members at an early stage in the project. Engagement and capacity building will adopt a gender-sensitive approach, as guided by the Gender and Social Expert. The development of detailed implementation plans will be undertaken in a participatory manner, encouraging input from all community members, including women.
Communities are incapable of managing and maintaining assets and structures built through the project.	Medium	Capacity building programmes will include training on maintenance and management techniques. Robustness of infrastructure will be an important value as from the design stage. Specific measures will be put in place to prevent theft of solar panels which are subject to theft throughout Namibia, e.g. fitting a movement and GPS to the panels to give an alarm when moved and track the movement if removed.
Technology transfer with its associated uncertainties	Medium	The point of departure is that the communities at Uis and Bethanie have not been exposed to high technology. Therefor technology transfer is a risk that will be assessed during the training given to the

Risk	Level	Management/Mitigation
		operators. From previous experiences it is likely that with the correct selection process, persons with the correct aptitude will have success with the operation of the plant.
Operation and maintenance of the plant	Medium	Since it is planned for the plant to be robust of nature, it is expected that the operation will have a lower risk than the maintenance. To mitigate the maintenance risk, it is planned to hire the services of technical equipped contractors in the vicinity to be responsible for the scheduled and break down maintenances.
Water Quality	Low	Water will be sampled at specified intervals and sent to the NamWater laboratory for internal or external testing in terms of bacterial and chemical analysis. The results will be made available to the project team to attend to as part of the piloting of the plants. In the event of non-compliance, NamWater is obliged to terminate the operation of the plant and attend to all defect processes before operation may continue. In terms of the Water Resources Management Act, 2013 the specified water quality testing regime must be continued for the lifetime of the plant. See Annexure 1 for chemical and bacteriological water quality standards.
Sustainability of the plant	Medium	One of the objectives of the pilot plant is to test the sustainability of the plant. The sustainability will be reviewed during the pilot project and mitigation measures will be recommended to ensure sustainability.
Institutional		
Low capacity, awareness and acceptance of the need to tackle the impacts of climate change among key stakeholders limit the support for the project and limit likelihood of project outputs being mainstreamed into plans and budgets.	Low	The project includes a capacity building programme for community members, councillors, traditional authorities and district and local authority officials on the importance of mainstreaming adaptation responses into planning, budgeting and policy development processes. This capacity building programme will build on the awareness generated and the support already raised amongst local authority officials.
Poor coordination with other climate change projects in Namibia limits the potential to learn from and build on the experiences of climate change related projects.	Low	During implementation, Project Managers and key team members from climate change projects within Namibia will be invited to group discussion with engagement of the NIE, to coordinate efforts, ensure that projects deliver complementary and mutually reinforcing outcomes and have a collective knowledge sharing experience.

Risk	Level	Management/Mitigation
Limited capacity of project partners to deliver project outputs.	Low	Project partners all have experience in coordinating, implementing and delivering outputs in their relevant spheres of expertise, as demonstrated by the successful implementation of previous projects. Additionally, the NIE will play an oversight role, providing further expertise if required.
Staff turnover within NamWater, Local Authorities, project partners, consultants and contractors may hamper progress.	Low	Institutional rather than individual relationships will be built between NamWater and Local Authorities and with project partners, limiting the negative impact of staff turnover.

NamWater has clear structures in place that provide for financial and project management risks. NamWater also must abide by the shareholder's regulations such as the Public Procurement Act, No. 15 of 2015 (PPA 2015). This act outlines the national procurement methods, the bidding process, and procedures for bidding challenge and review.

A separate project account will be opened in Namibian dollars with the First National Bank of Namibia, a financial institution that has been providing banking services to NamWater since inception in 1998. This will provide that all tranches for the project can be deposited directly into this account and all costs related to this project can be claimed from this account monthly. This separate bank account will be included in the annual organisational audits of the EE and the NamWater financials system will also be available for an audit if required.

C. Environmental and social risk management

The Environmental and Social policy of the Adaptation Fund is consistent with Namibia's environment management act, laws and policies which ensure that proposed developmental project do not affect the environment and people in the surrounding, but enhancement project benefits to the environment and the people. The proposed project is intended to increase the resilience of the most marginalised and vulnerable communities in the Southern part of Namibia by improving their quality of water which will improve the health of women and children and thus their self-esteems. Apart from improving health, good quality water will also lead to diversification of livelihoods in the project areas by construction of tourism facilities by the locals and attraction of business development due to good quality water.

The executing entity, NamWater, has implemented numerous capital water infrastructurel projects. In all these projects environment and social risks are mandatory for assessment by the Environmental Management Act 7 of 2007 prior to commencement of such as projects. Given the vast experience of the executing entity in environment and social risks assessment, it is anticipated that the proposed project will not have adverse effect to the environment and the people in the projects. Should any environmental and social effects occur, it is likely to mitigate at the community level and this will be small in scale and magnitude.

As mentioned earlier in Part II, Section K, below are the environmental and social risks for the proposed two sites. The risks were collected during the screening of the proposed technology to be used and most importantly during the stakeholder's consultative meetings. To ensure compliance with the AF requirements the identified risks were aligned with the environmental and social principles, mitigation measures were also proposed.

Table 33: Potential environmental impacts/risks

Identified risks/impacts	Environmental principles	Planned mitigation measure
Non-compliance with the laws and other administrative orders of national and state government.	• Principle 1 (required) – Compliance with National Regulations	• The project is in compliance with major laws such as National Climate Change Strategy & Action Plan 2013 – 2020, Water Resources Management Act (Act no. 11 of 2013), and Environmental Management Act 2012. • Valid Environmental clearance certificates for the existing water supply infrastructure at the proposed sites are available. • Environmental clearance certificates for the proposed concept design are available. • Water abstraction permits available for all sites. • Apply for brine disposal permits once the detailed design is completed. • Apply for a permit from MAWF if any protected tree needs to be removed. • Collect and submit water samples pre and post operation (testing or piloting phase) to make sure the Water Quality Standards are achieved.
Land acquisition and potential removal of local animals	• Principle 1 (required) – Compliance with National Regulations • Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	• Ensure careful selection of site to avoid sensitive habitats or priority species • The land would be owned or leased by NamWater where possible. • Proper protocol or consultation with relevant stakeholders or local authorities will be followed to acquire a piece of land if necessary. • No unintentional removal of local animals will be allowed, and if required consultation should be made with the Ministry of Environment and Tourism.

Identified risks/impacts	Environmental principles	Planned mitigation measure
Law changes during Construction Phase	• Principle 1 (required) – Compliance with National Regulations	• Proper communications should be done between NamWater and the various competent authorities (MET, MAWF etc.) to make sure what could change / is in process of being promulgated before construction starts, so that there are no surprises.
Land and vegetation clearing	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 14 – Physical and Cultural Heritage • Principle 15 – Lands and Soil Conservation	• Clear only the vegetation absolutely necessary for the plant construction and proper operations. • Only clear vegetation in phases, to minimise erosion and windblown dust. • Save the topsoil so that it can be reused later during rehabilitation. • Any Protected trees that needs to be removed, needs a permit from MAWF before this can be done. • If required ecological / botanical specialist must be appointed to assess the potential sites and the removal of any protected species where applicable.
Protection of natural systems	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 14 – Physical and Cultural Heritage • Principle 15 – Lands and Soil Conservation	• Disturbance of vegetation and faunal communities and their habitats is kept to a minimum. • Heavy construction vehicles should be kept out of the seasonal and ephemeral stream channels and the movement of construction vehicles should be limited where possible to the existing roads. • Riparian / Oshana areas disturbed should be rehabilitated, by the removal of alien vegetation where found and the re-vegetation of these disturbed zones with suitable indigenous vegetation. • All earthworks equipment operators shall be informed to cease operating immediately if any artefact is unearthed and to report the finding immediately to the Engineer / ECO and OTC, who in turn shall notify the National Heritage Council.

Identified risks/impacts	Environmental principles	Planned mitigation measure
Pollution of soil and groundwater	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall events. • The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. • All tanks and/or mobile bowsers shall be situated in a bunded area. • The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas.
Access, traffic and haul roads	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	• The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times. • Fencing to be installed and properly maintained.
Solid waste management	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• The Contractor shall provide sufficient number of rubbish bins with secured lids to prevent animal scavenging. • No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the site.
Hazardous substances	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• Hazardous chemical substances used during construction shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.
Trenches	• Principle 10 – Conservation of Biological Diversity	• Trenches shall be demarcated appropriately and securely and regularly monitored to ensure that pedestrians / animals (and vehicular) access to these areas is strictly prohibited.

Identified risks/impacts	Environmental principles	Planned mitigation measure
	• Principle 15 – Lands and Soil Conservation	
Erosion, water quality, and storm water	• Principle 9 – Protection of Natural Habitats • Principle 15 – Lands and Soil Conservation	• The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation. • The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works because of storm water flows. • Storm water should be managed appropriately at the culvert crossing where the pipeline is planned to go through underneath the road, so that blockage does not occur.
Leakage of brine into soil and groundwater from ponds (poor design, damage of lining during cleaning, flooding during heavy rain)	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall events. • Competence of operating staff employed at the plant • Develop a proper and up to date Operation and Maintenance (O&M) manual of procedures with technical guidelines • Routine and proper environmental monitoring of all aspects of the plant. • Establish regular reporting procedures on maintenance • Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged/ deficient equipment, as per the Operation and Maintenance Manual • Brine peak flow monitoring by monitoring the incidence of overflow at pump stations leading to the ponds and accurate recording of flow metering. • Monitoring of surrounding boreholes for potential contamination of surrounding sources or from the brine evaporation ponds.

Identified risks/impacts	Environmental principles	Planned mitigation measure
Non-sustainability of water sources being over used	• Principle 11 – Climate Change (indirect climate change aspects)	• Routine and proper monitoring of all aspects of the plant. • Proper monitoring of water being pumped / being used or wasted. • Regular checks on all aspects of water usage be reported
Health hazard to animals entering the pond area	• Principle 9 – Protection of Natural Habitats	• The Plant and ponds need to be properly fenced to keep animals from entering the site.
Collision of birds with wind turbines	• Principle 9 – Protection of Natural Habitats	• Further assessment and monitoring be done on the effects of the wind turbines on surrounding wildlife, especially birds once the detailed design is completed.
Potential of birds being attracted to the ponds	• Principle 9 – Protection of Natural Habitats	• Further assessment and monitoring be done on the effects of the ponds on surrounding wildlife, especially birds once detailed design is completed.
Fire or explosion of plant	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	• Proper Risk Management Plan and Emergency Plans be in place. • Staff be trained and knowledgeable of the steps and procedures to follow in the event of a fire or explosion onsite. • Proper signs and emergency procedures be placed visible on site.
Used equipment such as RO filter disposal	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 12 – Pollution Prevention and Resource Efficiency	• Proper disposal plan be provided on how to dispose of plant equipment, be it; to sell the equipment to be reused / recycled by a prospected buyer; or the disposal at a licenced landfill site. • A disposal certificate must be obtained and signed off by a licenced waste disposal specialist.

Identified risks/impacts	Environmental principles	Planned mitigation measure
Improper reuse of the brine / salt-by-product	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 12 – Pollution Prevention and Resource Efficiency	• The use of brine (salt) produced during water treatment for agricultural / other uses is encouraged due to the high levels of nutrients inherently contained therein. • Proper research must be done to make sure that the brine / salt-by-product is used in the correct ways. • In addition, such use must be strictly controlled and monitored with restrictions on specific uses to ensure the health and safety of both the producers and the consumers of the products to which the brine / salt-by-product has been applied (DWAF, 2012).

Table 34: Potential social impacts/risks

Identified risks/impacts	Social principles	Planned mitigation measure
Human rights (water as a basic need)	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 11 – Climate Change • Principle 7 – Indigenous People. • Principle 13 – Public Health	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts.
Land acquisition and potential removal of local people	• Principle 1 (required) – Compliance with National Regulations • Principle 2 – Access and Equity (see also gender policy)	• The land would be owned or leased by NamWater where possible. • Proper protocol will be followed by NamWater to acquire any additional piece of land if necessary.

Identified risks/impacts	Social principles	Planned mitigation measure
	• Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts; • Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples.
A temporary loss of land and assets to the road servitude or areas to be occupied by project-related surface infrastructure	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts; • Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based on Informed Consultation and Participation

Identified risks/impacts	Social principles	Planned mitigation measure
		(ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples.
A population influx (due to the presence of a construction workforce, as well as an influx of job-seekers into the area), with a possible concomitant increase in social pathologies and increased pressure on existing infrastructure and services.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• The recruitment policy used to employ people on the project must be fair and transparent. • The intention of giving preferential employment to locals is clearly communicated, to discourage an influx of job-seekers from other areas. • Inform local businesses about the expected influx of construction workers so that they could plan for extra demand. • Ensure that employment procedures/ policy of the contractor is communicated to local stakeholders, local farmers and Local Ward Councillor. • Have clear rules and regulations for access to the construction site to control loitering. • Consult with the local private security companies and Police to establish standard operating procedures for the control and removal of loiterers at the construction site. • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.

Identified risks/impacts	Social principles	Planned mitigation measure
Disruption of access routes and daily movement patterns by the construction. Access, traffic and haul roads.	• Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	• Unauthorised access to the construction site must be prevented through appropriate fencing and security. • When the construction period has ended the implementation of adequate rehabilitation measures to return the landscape and other changes to at least its original state. • The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times.
Impacts on sense of place. Such impacts may arise because of the visual intrusion of project-related infrastructure, as well as noise and traffic impacts during construction Visual disturbance from wind turbines and solar panels	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People.	• Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs. • The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities.
Dust caused by the construction works and from movement of heavy equipment. During the construction phase, the local community and construction workers would be inconvenienced by the dust generated by the construction works.	• Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• Dust suppression is to be conducted throughout construction. • The use of enclosures, screens and sheeting should be considered to contain dust. • The contractor is to take appropriate measures to minimise the generation of dust because of excavation works. Such measures include frequent spraying of water during low rainfall • Paved or surfaced roads should be used where possible. Where none are available, the required

Identified risks/impacts	Social principles	Planned mitigation measure
		dust suppression measures as stipulated in this ESMP must be implemented. • Speed limits must be enforced in all areas to reduce the generation of dust. • Cover dump trucks before traveling on public roads or relevant as per ECO approved method statement. • Keep soil loads below the freeboard of the truck to minimise fugitive dust. • Revegetate disturbed areas as soon as possible after disturbance. • When feasible, shut down idling construction machinery. • Tighten gate seals on dump trucks. • No burning on site and close to settlements.
Noise and vibration due to the construction works and from movement of heavy equipment. Movement of heavy machinery on existing local roads may be one of the core problems for the local community during the construction phase.	• Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• Construction activities should be restricted to daytime hours between 07:00 to 18:00. • Adjacent households should be consulted and notified of any construction activities that could lead to excessive noise levels in advance. • The households should also be consulted if any night time construction activities are to take place.
Improper ablution facilities provided	• Principle 6 (required) – Core Labour Rights	• Adequate chemical toilets must be provided for all staff. Alternatively, existing ablution facilities on site can be utilised if available. • The contractor camp: ensure the necessary ablution facilities are provided, with chemical toilets where such facilities are not available at commencement of construction. • Chemical toilets must be empty, kept hygienically clean and secured, they must be emptied /

Identified risks/impacts	Social principles	Planned mitigation measure
		serviced on a regular basis to prevent them overflowing. • Adequate toilets and showers must be positioned at the right places.
Socio-cultural differences and conflicts between migrant workers and the local community. Single men predominately occupy the construction camps which could create social conflicts, usually because of cultural differences, alcohol abuse or being away from their wives or partners for extended periods of time. A possible reason for conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local community. An influx of unemployed job seekers could also add to the potential for conflict.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People • Principle 14 – Physical and Cultural Heritage	• Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • Loitering of outsiders at either the construction site or at the construction camps should not be allowed. Local Police should be requested to assist in this regard. • Align awareness campaigns with those of other organisations in the area (i.e. the Local Council). • Control of access to construction camp. • Cease construction activities before nightfall, if possible. • Liaison with police, community policing forum and security stakeholders.
Various social pathologies, such as drug/ alcohol misuse, abuse of woman and children and incidences of sexually transmitted diseases (STI's) may increase with the influx of job-seekers into the area.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy)	Social pathologies: • Implement HIV/ AIDS, alcohol abuse, drug abuse, and domestic violence prevention and awareness campaigns in the communities. • The contractors should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a

Identified risks/impacts	Social principles	Planned mitigation measure
Crime is another social pathology that may increase. An inflow of construction workers and job seekers may also be accompanied by an increase in crime. Even if specific instances of crime are not because of the newcomers, they may still be ascribed to them by local communities.	• Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People. • Principle 13 – Public Health	minimum, include programmes to combat HIV/ AIDS and TB. • The contractor should make HIV/ AIDS and STD awareness and prevention programmes a condition of contract for all suppliers and sub-contractors. Crime: • Regarding safety and security, construction workers should be clearly identifiable. • Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • The construction site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations. • Control of access to construction camp. • Cease construction activities before nightfall, if possible.
Informal settlements. Once construction is concluded and the camp is vacated, it may be illegally occupied.	• Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	• Once construction is completed and the construction camp vacated, the camp must be demolished to avoid settling of informal residents. Alternatively, if the camp is to be made available for use by other contractors on other projects, it should be "mothballed" until the new occupants take up residence.

Identified risks/impacts	Social principles	Planned mitigation measure
Local economy opportunities and economic empowerment. The construction phase of the project will have temporary positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 7 – Indigenous People.	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. As for maximising employment benefits. Also: • Develop register of local SMMEs. SMME skills development as part of Corporate Social Investment (CSI) programme. Community education.
Training and skills transfer. The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Principle 11 – Climate Change • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for construction related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc. • Identify vulnerable people, youth and women to take part in training and skills transfer programmes.
Reluctance of beneficiaries to use desalinated water	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ongoing community education. • Establish a Stakeholder Liaison Committee.
Sustained future operation, management and maintenance of the plants	• Principle 11 – Climate Change	• Plan the project in such a way to minimise social costs and maximise the benefits discussed.

Identified risks/impacts	Social principles	Planned mitigation measure
Risk of skill loss – skilled staff leaving NamWater employ during / after Pilot Phase (Sustainability)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights	• Local people can be trained part-time during the construction period to attain skills necessary for operation of the plant. • Details of the proposed project should be designed in consultation with community. • NamWater should support or endorse existing development programmes. • Skills transfer should be encouraged by identifying people with the potential • On-site or in-job training should be encouraged • Promote skills development programmes related to alternative economic activities
Possible unaffordable water tariff for desalinated water Collapse of the South African Rand (and the N$)	• Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 7 – Indigenous People	• Provide subsidies to the schemes as per normal cross-subsidization norms applied by NamWater.
Theft of solar panels and other materials	• Principle 7 – Indigenous People	• Site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations.

Identified risks/impacts	Social principles	Planned mitigation measure
Visual impact of the plant, solar panels and wind turbine infrastructure.	• Principle 7 – Indigenous People	• Sensitisation must be done to provide effective mitigation measures and acceptance of the project where possible.
Noise impacts form the plant and wind turbines	• Principle 7 – Indigenous People	• Adequate controls of heavy vehicle traffic to mitigate negative impacts such as noise and sense of place.
Fire or explosion of plant	• Principle 7 – Indigenous People • Principle 13 – Public Health	• Health and safety protocols to be put into place. A method statement is required for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage. • No persons allowed on site other than project employees. • Minimal materials are stored. • All waste disposal bins will be emptied. • Materials are stored in leak-proof, sealable containers or packaging. • The store area is secure and locked. • Basic firefighting equipment must be available on site. Fire extinguishers are serviced and accessible. • The area is secure from accidental damage through vehicle collision, etc. • Emergency and contact numbers of the contractor are available and prominently displayed. • All stores will be secured. • Chemical toilets are empty, kept hygienically clean and secured. • 24-hour security will be on site during this period. • All trenches are barricaded with danger tape.

Identified risks/impacts	Social principles	Planned mitigation measure
Plant down-time (no water provision)	• Principle 2 – Access and Equity (see also gender policy)	• Water will be stored in existing / additional reservoirs to have back-up water for a minimum of 48h so that the problem can be fixed within that time frame. • If the problem persists after the 48h, water provision will temporarily switch back to the old water scheme standards.
Water quality changes (+) The project is aimed at improving the quality of water for NW to comply with the new water quality regulations of the Water Resources Management Act of 2013	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Regularly test water to ensure continuous compliance with water quality regulations.
Local employment and job opportunities. The construction phase of the project will have a positive impact on the local labour market. A positive impact on continued permanent employment will be probable due to the proposed project as the long-term economic viability of the plant will be possible, following the plant expansion. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• Unskilled job opportunities should be afforded to the local communities, as far as possible. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities. • Individuals with the potential to develop their skills should be afforded training opportunities. • Payment should comply with applicable labour legislation in terms of minimum wages. • Where local labourers are employed on a permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' construction

Identified risks/impacts	Social principles	Planned mitigation measure
		phase positions have become redundant or once the construction phase comes to an end.
Local economy opportunities and economic empowerment. The operational phase of the project will have positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. As for maximising employment benefits. Also: • Develop register of local SMMEs. • SMME skills development as part of Corporate Social Investment (CSI) programme. • Community education.
Improved health. The project will provide the local community with better quality water and this will have a positive impact on the health of the people. (+)	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Regularly test water to ensure continuous compliance with water quality regulations.
Savings on current expenses. Due to the better-quality water, medical expenses would be less (dentists) and less frequent need to replace water usage equipment (Geysers, kettles etc.). (+)	• Principle 11 – Climate Change • Principle 7 – Indigenous People	• Regularly test water to ensure continuous compliance with water quality regulations.
Self-esteem upliftment. With cleaner teeth comes higher self-esteem, less likelihood of depression and social betterment regarding relationships and even job performance. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People	• Regularly test water to ensure continuous compliance with water quality regulations. • Provide training in basic hygiene. • Provide counselling programmes.

Identified risks/impacts	Social principles	Planned mitigation measure
Training and skills transfer. The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Principle 11 – Climate Change • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc. • Identify vulnerable people, youth and women to take part in training and skills transfer programmes.

In view of the above mitigation measures, the project implementation team, and the PSC teams will be sensitised of these measures during the meetings. Risks which will arise during implementation based on the monitoring will be recorded and mitigation measures will be build in. Also, social audit would be put in place that would also help in mitigation of some of risk enlisted under Environmental and Social Policy of the Fund.

Due to the project objective and design it is important to note that with mitigation measures extending into project intervention implementation, the executing entity will ensure that environmental and social risks, if any will be adequately and timely addressed through a management plan or changes in project design. The existing system of annual project performance reports and the mid-term and terminal evaluation reports will be designed to track any required environmental and social risk management plan or changes in project design. In order to ensure that the implementing partners are fully aware of their responsibilities with regards to provision of the Environmental & Social Policy of Adaptation Fund, NamWater will orient the partners on the guidelines, systems and procedures related to the environmental and social policy including the grievance mechanism.

D. Monitoring and evaluation

Both the NIE and the EE are involved in monitoring and evaluation, although at different levels.

Project start-up

An inception meeting with all key partners and stakeholders will be held to agree on the overall goals, outputs and outcomes of the project. The programme outline and activities will be presented and verification of baselines that underpin the M&E plan will be undertaken. This will ensure full understanding and ownership of the programme by all partners.

The schedule of progress, indicating important milestones and deliverables, will be compiled and will constitute the annual project work plan. It will contain qualitative, quantitative and financial information. The NIE will provide clear guidelines on procedures that will apply to implementation of programme activities.

All team entities and partners (e.g. Village Councils) to commit to their responsibilities. These must include compiling scheduled progress reports as prerequisites for continued funding.

An Inception Report will document the proceedings and will form the basis for the contractual arrangements between the various organisations.

Quarterly monitoring

The construction and commissioning of the infrastructure at Uis needs to happen promptly in the early stages of the project, the installations at Uis and the Bethanie site are the main deliverables in the first year.

These critical milestones will be monitored from the beginning through quarterly inspections with the participation of the team entities as well as the relevant staff of the Village. The inspections will form the basis of the condition and performance monitoring that will be reported on every 3 months.

Overall progress will therefore be monitored throughout the 3-year project through reports that are submitted by the EE (NamWater) to the IE (DRFN) on a quarterly basis. A template for routine reporting will be developed by NamWater in close consultation with the NIE and with consideration given to the requirements of the AF. All sub-Executing Entities will provide their inputs to NamWater in a timeous manner.

The quarterly reports will give attention to any unanticipated events or problems, and will raise these as risks requiring further monitoring. These issues will be brought to the attention of the IE in case they cause any alterations to the milestones and financial schedule. The reports will also include forecasting for the next quarter to underpin disbursement of funds for project activities. The EE and the NIE will meet to discuss these reports within one week after the reporting period.

Site visits

Periodic site visits by DRFN will be made to verify the substance of the Quarterly Reports. Site visits will not follow a set schedule, but will be dictated by need and should not be less than once per year.

Annual reporting

Annual reporting templates will be developed by the NIE in cooperation with the EE. The EE will prepare Annual Implementation Reports to track progress according to programme objectives and outcomes, using the information from the Quarterly Reports and any consequences.

The Annual Implementation Report will include:

- Progress made on the infrastructure installations and training of relevant NamWater and Council staff to maintain it (= outputs)
- Information on the outcomes, as measured by specified indicators
- Emphasis on possible challenges and risks that deserve attention
- Expenditure reports
- Reporting on alignment of the project with the AF Environmental and Social Policy, using the indicators identified in the Inception phase.
- Lessons learnt
- Assessment of beneficiaries in terms of gender and vulnerability

Account audits will be undertaken annually as part of the financial management procedures of both the EE and the NIE. Final audits will be undertaken at programme completion.

Mid-term Evaluation

By the end of the first 1.5 years, all the infrastructure at the two sites should be installed and functioning and training of local representatives should be underway. This marks a logical point to assess project implementation and whether the intended outcomes are being reached.

Alignment with the AF Environmental and Social Policy, and with the intended outcomes of the project, will be emphasised. Scrutiny will be given to the indicators of this progress that were identified in the Inception phase.

The Mid-term Evaluation will be undertaken by an external evaluator to be appointed and funded by the NIE (DRFN). Any necessary alteration in the deliverables or the schedule will be discussed and resolved at this point.

Final Evaluation

A Final Evaluation report will be produced within 3 months after project completion. Again, this will be undertaken by an external evaluator to be appointed and funded by the NIE.

This should focus on the delivery of the project's results as originally planned and possibly altered during the Mid-term Evaluation. They will be assessed in the context of the vulnerabilities that were identified before commencement, and how the project has contributed to improving resilience.

The Final Evaluation will also concentrate on the sustainability of the outputs. Take-over by the affected communities is important, so their capacity to manage and maintain the systems will be assessed. Also, all documentation of the process for the benefit of replicating the systems in other small villages should be in place.

Detailed budgets for the Project Execution Cost required by the EE and for the Project Management Fee required by the NIE are presented in Part III, Section G below.

The table below is a breakdown of how EE fees will be utilised in the supervision of the M&E function.

The table below is a breakdown of how EE fees will be utilised in the supervision of the M&E function.

Table 35: Monitoring and Evaluation Plan and Budget (9.5%)

Item	Responsible party	Execution Intervals	Cost (USD)
Management and supervision			
Contractual development and familiarisation	EE	Once-off	5 600
Assignment of a project manager to the project	EE	Once-off	5 600
Placement of adverts and appointment of consultants or contractors	EE	Once-off	5 600
Assignment or appointment of a site scientist or engineer	EE	Monthly	50 000
Project components final design	EE	Once-off	30 000
Construction supervision	EE	Monthly	25 000
Quality management plan	EE	Quarterly	15 000
Sustainability and exit plan	EE	Quarterly	19 000
Communication plan	EE	Quarterly	18 000
Data collection			
Sampling sites establishment	EE	Once off	4 500
Instruments performance assessment	EE	Monthly during piloting	11 000
Water quality sampling and analysis	EE	Monthly during piloting	30 000
Community perception surveys	EE	Quarterly during piloting	5 700
Knowledge Management Plan and Database maintenance	EE	Monthly during piloting	4 500
Progress report and meeting			
Inception meeting with key stakeholders	EE, NIE, MWAF, & MET	Once-off	5 000

Item	Responsible party	Execution Intervals	Cost (USD)
Community inception meeting	EE, NIE, Village councils, & Regional council	Once-off	8 500
Communication to community members or stakeholders	EE, NIE	Quarterly	5 000
Project meetings (Core team)	EE	5 times a year	30 000
Project meetings (Technical Advisory Committee)	EE	Bi-annually	3 500
Internal quarterly report	EE	Quarterly	30 000
Final Report	EE	Once off	4 500
Mid-term review	NIE, EE	Once -off	6 000
Periodic field Survey report	EE	Quarterly	5 400
Catering, venue, material	EE, External suppliers	Number	15 000
Financials			
Financial/Accounting supervision	EE	Monthly	7 000
Internal Verification and Audit preparation	EE, External auditor	lumpsum	25 000
Bank charges	EE	Months	8 500
Other related expenses for the site scientist or engineer			
Office space and local travels	EE	Monthly	45 000
Internet access	EE	Monthly	5 395
Consumables (telephone, stationeries etc.)	EE	Monthly	4 500
Total Costs of Monitoring and Evaluation (Executing Entity fee (9.5%))			437 795

E. Results framework

Table 36: Results framework

Outcome	Indicator	Baseline situation	Target	Sources of verification
Component 1: Development of pilot desalination plants at Bethanie and Grünau				
Outcome1: Knowledge of the design, construction and installation of small desalination plants using RO technology	• The technical knowledge to plan, design, and construct small-scale desalination plants using RO technology. • Number of women and men participating in the design. • Number of plants design prepared.	• The existing NamWater knowledge is limited to experimental micro-plants using RO technology conducted at (Epukiro Post 3 and Bethanie). • No information about the membrane technology operating on renewable resource exists. • CuveWater international project team installed four different types of small-scale groundwater thermal desalination plants in the Omusati Region at Amarika and Akutsima but not operated with renewable energy.	• Demonstration by NamWater that the technical knowledge has been acquired by establishing two small-scale desalination plants using RO technology.	• Two desalination plants ready to be commissioned and piloted exist on the ground.
Component 2: Development of pilot hybrid renewable energy plants at Bethanie and Grünau				
Outcome 2: Knowledge of the design, construction and installation of hybrid renewable energy plants to power small desalination plants	• The technical knowledge to plan, design, and install hybrid renewable energy (sun/wind) systems to power small-	• The existing NamWater knowledge is restricted to application of photovoltaics for powering communication	• Demonstration by NamWater that the technical knowledge has been acquired by establishing two hybrid renewable energy (sun/wind) systems to	• Two hybrid renewable energy (sun/wind) systems ready to be commissioned and piloted exist on the ground.

Outcome	Indicator	Baseline situation	Target	Sources of verification
	scale desalination plants. • Number of women and children participation in the development and installation of the plants. • Number of renewable energy plants units installed.	equipment and borehole pumps.	power small-scale desalination plants	
Component 3: Testing and commissioning of plants at Bethanie and Grünau, and training of staff				
Outcome 3: Knowledge and understanding of operating the plants and of adjusting the treatment train to achieve required quality of water.	• Sufficient knowledge to commission small-scale RO desalination plants powered by hybrid renewable energy (sun/wind) systems to produce good quality water. • Number of trained operational and maintenance staff. • Amount of information acquired and knowledge transformed into operation and maintenance manuals. • Number of successful testing. • Number of women participating in the testing and commission of the plants and the training. • Number of demonstrations	• NamWater has no practical knowledge of small-scale RO desalination plants powered by hybrid renewable energy systems. • No information available at the settlement, village or national level about this plants testing and commissioning.	• 5 Trained staff capable to operate and maintain the plants, with supportive operating and maintenance manuals available. • 10 demonstrations conducted for the community members, learners and students on how the plants operate. • One operational and maintenance manual for the plants at each project area. • % Improvement in the knowledge of operating the plants by women	• Two functional small-scale RO desalination plants exist and have demonstrated the ability to produce blended desalinated water. • Operational and maintenance staff have demonstrated the ability operate and maintain the plant. • Operation and maintenance manuals exist and are available to staff on site.
Component 4: Piloting of the plants at Bethanie and Grünau				

Outcome	Indicator	Baseline situation	Target	Sources of verification
Outcome 4: • Information and knowledge of medium-term performance of plant. • Knowledge and ability to continuously produce water of the required quantity and quality. • Exposure of students to the technology applied at the plants.	• Records of plant performance and maintenance requirements. • Continuous availability of water that complies with the Namibian quality standards for drinking water • Number of students who are aware of and understand the principles and operation of the plants. • Number of women involved in the piloting process. • % increase in improvement of households' water related activities due to the availability of clean water.	• No information available about this type or scale of desalination plants. • Water presently supplied does not comply with the Namibian quality standards for drinking water.	• Collect sufficient information to compile a comprehensive report to ascertain the technical and financial feasibility and viability of small-scale RO desalination plants powered by hybrid renewable energy (sun/wind) systems. • Supply the reasonable demand for good quality water at the two project sites. • Realistic water supply to fully meet the community current and future water demand. • At least 99% of the household using desalinated water. • At least 50 engineering students understand the principles and operation of the plants. • At least 99% improvement in household related activities due to availability of good quality water.	• Project piloting reports containing all collected information from the two sites. • Water production records and water quality analyses. • Updated operation and maintenance manuals.
Component 5: Supply good quality water to the communities at the two project sites during piloting of the plants				
Outcome 5. Improvement in health of the beneficiaries and increase	• Good quality water is available to all inhabitants of Bethanie and Grünau.	• Previously supplied water caused various socio-health problems	• Create and maintain improved overall socio-health condition of the	• Surveys on the perception of the beneficiaries about the

Outcome	Indicator	Baseline situation	Target	Sources of verification
in their adaptive capacity to climate change	• Beneficiaries are delighted with taste and lack of hardness of the water • Adverse health symptoms have disappeared. • Number of health incidents due to poor water quality.	described in the ESG stakeholder reports.	beneficiaries during the pilot period. • Support and ownership of the proposed solution by the communities' members. • At least 50% reduction in health incidents related to poor water quality. • 75% of the total population of women not complaining about the effect of water quality on their hair and brown teeth formation • At least 85% improvement in romantic relation due to available good water quality and good looking teeth's of women.	quality of water from the plants. • Meeting attendance register.
Component 6: Sensitise beneficiaries and local stakeholders				
Outcome 6: 1. Strengthened awareness and ownership of the adaptation and climate risk reduction process local level. 2. Strengthened institutional capacity to reduce risks associated with climate-induced	• Women, children and other beneficiaries actively participate in the sensitisation program. • Community leaders, teachers and other local stakeholders attend public meetings and information sessions. • Communities understand and accept the intervention.	• No previous awareness existed.	• 100% support and a sense of ownership of the proposed solution by the communities, such as accepting the use of desalinated water to improve their general livelihoods and to strengthen their understanding of adapting to climate change.	• Responses or comments from the community members during the sensitisation program. • Good attendance of information sessions. • Water consumption remains within accepted norms. • Consumers pay for their water.

Outcome	Indicator	Baseline situation	Target	Sources of verification
socioeconomic and environmental losses	• Beneficiaries and stakeholders who are aware of and understand the concepts of climate change and adaptation, renewable energy, and the need to conserve water. • Numbers of women and children participating in the sensitisation program. • % increase in the number women and children attending the sensitisation campaign. • % of local stakeholders supporting the proposed solution. • Number of learners understanding the effect of climate change on water supply. • Number of women and children understanding the effect of climate change on water supply. • Number of students understanding the effect of climate change on water supply		• Sensitization documents developed and made available to community. • 99% of the inhabitants who understand why water has a price and who are willing to pay. • At least more than100 women and children participating in the sensitising program. • 99% support of the project by the critical stakeholders such as: Ministry of Environment and Tourism, Ministry Agriculture Water and Forestry, Ministry of Rural and Urban Development, NGO's and Ministry of Lands and Resettlement, • 75% of the leaners in the project areas understand the effect of climate change on water supply. • 75% of the students from academic higher institutions involved in the project or visit the sites understand the effect of climate change on water supply.	
Component 7: Information and knowledge dissemination to regional and national stakeholders				
Outcome 7.	• Number of request from the regional and	Previously stakeholders were unaware of the	• One critical report on the desalination	• Responses or comments from

Outcome	Indicator	Baseline situation	Target	Sources of verification
1. Stakeholders in the rural water sector accept that small-scale desalination powered by renewable energy is a viable option to improving the quality of water supplied	national stakeholders that the same technology be adopted and implemented elsewhere. • Number of stakeholders understanding the effect of climate change on water supply and available adaption needs and options • Number of reports/books/journal articles generated.	viability of desalinating water for rural communities.	technology operating on renewable energy success story. • At least one publication of membrane technology with renewable energy in a reputable journal • At least 10 Small-scale desalination technology and systems replicates proposed to be implemented in the country.	stakeholders participating in the knowledge outreach sessions. • Enquiries for information or assistance are received from stakeholders. • Requests to replicate the technology at other NamWater schemes that supply poor quality water.

F. Alignment with AF Results Framework

Table 37: Alignment with AF results framework

Project objective (s)	Project Objective Indicators	Fund Outcome	Fund Outcome Indicators	Grant Amount (USD)
1. **Acquire knowledge and skills** on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology that can be applied to improve the resilience of rural communities against climate change.	• Two effective, functional and well-maintained plants that on a continuous basis supply sufficient quantities of water that complies with Namibian quality standards for drinking water • Recorded knowledge in the form of planning, design, construction and plant performance reports, as well as operation and maintenance manuals	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress. Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.	**4.1.** Development sectors' services responsive to evolving needs from changing and variable climate. **4.2.** Physical infrastructure improved to withstand climate change and variability-induced stress. **5.** Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress. **2.1.** No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks. **6.2.** Percentage of targeted population with sustained climate-resilient livelihoods.	**4 157 462**

Project objective (s)	Project Objective Indicators	Fund Outcome	Fund Outcome Indicators	Grant Amount (USD)
2. **Positively impact the lives of vulnerable individuals and communities** at the two project sites by supplying them with water that complies with the water quality standards, raising their awareness of climate change and the effects on water supply, and creating an understanding by them of why water tariffs are imposed.	• Good quality water is available to all inhabitants of Bethanie and Grünau • Beneficiaries are delighted with taste and lack of hardness of the water • Adverse health symptoms have disappeared. • Support and a sense of ownership of the proposed solution by the communities, such as accepting the use of desalinated water to improve their general livelihoods and to strengthen their understanding of adapting to climate change • Inhabitants do not use water wastefully • Inhabitants understand why water has a price and are willing to pay	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors. Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress. Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.	**4.1.** Development sectors' services responsive to evolving needs from changing and variable climate. **4.2.** Physical infrastructure improved to withstand climate change and variability-induced stress. **5.** Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress. **2.1.** No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks. **3.1.** Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses. **3.2.** Modification in behaviour of targeted population.	**7 299**

Project objective (s)	Project Objective Indicators	Fund Outcome	Fund Outcome Indicators	Grant Amount (USD)
3. **Communicate the acquired knowledge and skills to stakeholders** in the water supply sector and thereby promote the mainstreaming of such small-scale desalination technology and systems in the country	• Stakeholders in the rural water sector accept that small-scale desalination is a viable option to improving the quality of water supplied • Regional and national stakeholders request that the same technology be adopted and implemented elsewhere	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses. Outcome 7: Improved policies and regulations that promote and enforce resilience measures.	**2.1.** No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks. **7.** Climate change priorities are integrated into national development strategy.	**5 474**

G. Detailed budget

Table 38: Detailed budget for Project Activity Cost (A)

Components and activities	Budget (USD)	Budget notes
Component 1: Development of pilot desalination plants at Bethanie and Grünau	**2 284 230**	
1.1 Civil works	**870 940**	
Bush clearing of site; fencing of evaporation ponds	130 641	Clearing of lands used for evaporation ponds. This is an opportunity to utilize local inputs to foster community involvement. Fencing will be contracted to a specialist due to the nature of high level safety required.
Construct evaporation ponds	391 923	Design and building of evaporation ponds.
Line evaporation ponds	182 897	Allowed for lining material to prevent brine leakage.
Construct roof structures for package plants	104 513	This is to provide a “plant building” to protect the desal containment controls from weather. Integration with PV Field by placing PV on this roof structure.
Professional fees @ 7.5%	60 966	As stated for professional inputs such as designs etc.
1.2 Pilot water treatment plant	**1 137 888**	
Acquire UF/RO pilot package plants	819 280	Costs allocated to containerized systems that can be purchased as specified by design for each site.
Install pilot plants	68 273	Installation costs inclusive of customs fees and taxes.
Test and commission plants; train operators	11 379	Fees and other costs to facilitate effective and efficient plant testing and hand-over for pilot operations.
Compile manuals; collect and analyse data	125 168	Development of operations and maintenance manuals, along with data collection to facilitate information gathering and analysis.
Acquire spares for piloting	34 134	Costs allowed for plant modifications based on lessons learnt as the plant goes through the pilot operations phase to increase success rate. This is essential to provide guarantees for replication.

Components and activities	Budget (USD)	Budget notes
Professional fees @ 7.5%	79 652	As stated for professional inputs such as designs etc.
1.3 Mechanical and electrical works	**275 402**	
Connect plant to existing systems and reticulation	22 032	Allowed for necessary mechanical and electrical connections to integrate the desalination plant into the existing system / reticulation.
Acquire and install pipes, valves and raw water storage	123 931	Costs for pipework, control valves (manual and automatic), water tanks (raw water) and other such equipment.
Acquire and install flowmeters and instrumentation	82 620	Costs for data collection equipment that will provide measurements of quantity and time of water flows along with recording and instantaneous / real-time indication instrumentation.
Acquire and install telemetry/radio communication	27 540	Telemetry to provide remote information exchange and assist with data/information gathering.
Professional fees @ 7.5%	19 278	As stated for professional inputs such as designs etc.
Component 2: Development of pilot hybrid renewable energy plants at Bethanie and Grünau	**1 486 154**	
Acquire and install turbines	401 262	Allowed for wind turbines, structures, controls procurement and construction.
Acquire and install solar fields	549 877	Cost of solar field inclusive of solar panels, racks, cabling and sensors.
Acquire and install battery banks (48 V)	312 092	Costs of energy storage systems and containment.
Acquire and install inverters and BOS	59 447	This budget covers the DC/AC inversion equipment and along with transformation as designed.
Acquire and install electrical & SCADA equipment	14 862	Covers all integration electrical systems and SCADA to benefit effective plant operation and data/information exchange.
Acquire and install civil works safety and security system	44 585	Technical equipment and installation as required and designed to facilitate safe plant operations and community safety. Includes fencing and security systems.
Professional fees @ 7.5%	104 031	For professional inputs such as designs. and legal requirements.

Components and activities	Budget (USD)	Budget notes
Component 3: Testing and commissioning of plants & training of staff and students	**19 161**	
3.1 Test all components and complete systems, correct shortcomings, adjust controls, verify quality of product water.	1 916	Infrastructure commissioning.
3.2 Provide specialized training to operations and maintenance staff.	8 431	Training of the individuals that have direct responsibility for effective operation of the respective plants inclusive of electrical (hybrid) interaction. Also includes training of community based officials to keep local change-makers abreast of the technology and the intervention.
3.3 Produce training and maintenance manuals, so that information is formalised and can be passed on without loss of content	5 173	Preparing and production of manuals in print and electronic format that can be used as training tools.
3.4 Involve a gender balanced group of tertiary institution students in all aspects of plant establishment to facilitate knowledge dissemination	3 641	This budget line will provide for interaction with the academic community. It will have specific reference to youth and gender interactions facilitating mainstreaming of gender understanding at these institutions as part of their future curriculums.
Component 4: Piloting of the plants at Bethanie and Grünau	**367 917**	
4.1 Operate, maintain and improve the desalination plants.	264 900	Operations and maintenance costs including water demand, water quality and management strategies.
4.2 Operate, maintain and improve the power plants	40 471	Operations and maintenance costs including understanding energy demand and its impact on water quality and management strategies.
4.3 Update the training, operations and maintenance manuals	14 717	Activity is based on internalizing on-going lessons learnt to have updates to the dynamic pilot period manuals and records.
4.4 Collect technical and social information, and record lessons learned.	33 113	Collection of information disaggregated to show all technical and non-technical interactions throughout the pilot period.

Components and activities	Budget (USD)	Budget notes
4.5 Site visits by a gender balanced group of tertiary institution students, to impart knowledge and skills on the plants and the associated social effects on the beneficiaries.	14 717	Capacity building that will focus on a training of trainer's philosophy thus equipping academics with real life interactions. The academics will get a better understanding of gender and water use needs.
Component 5: Supply good quality water to the communities at the two project sites during piloting of the plants	**0**	
5.1 Operate and maintain the plants		***Cost included in Activities 4.1 and 4.2 above.*** *Supply good quality water on a continuous basis.*
5.2 At the end of the piloting period, handover of the infrastructure to NamWater to ensure continuation of water supply.		***Cost included in Activities 4.1 and 4.2 above.***
Component 6: **Sensitise project beneficiaries and local stakeholders at Bethanie and Grünau**	**7 299**	
6.1 Hold various public meetings and demonstrations to share information.	4 234	To assist the local communities, senior officials and the wider public understand desalination and how they can be powered with sustainable energy sources. Training on the use of desalinated as a source of fresh drinking water (includes hygiene and water demand issues).
6.2 Directly target children at school with information supply.	876	Although a small amount is allocated, it is sufficient for additional support for direct material targeting youth and gender material for communities to be aware of the impact of climate change on water resources, and of desalination on quality of life and sustainability.
6.3 Use female technical and social students to impart knowledge and skills to community women, and to survey their response to the intervention.	2 190	Specific focus on technical and social academic females at various institutions. Giving them hands-on interaction, knowledge, skills and confidence going forward.

Components and activities	Budget (USD)	Budget notes
Component 7: Information and knowledge dissemination	**5 474**	
7.1 Conduct workshops with community leaders, government officials on local and regional level, and policy- and decisionmakers in the rural water sector to share the project experience and lessons learnt from the project.	3 722	Formal workshops held within communities that will help them better understand the benefits of desalination and its overall impact on youth and gender in terms of quality of life. Documentation produced that will better inform policy makers on the lessons learnt and quality of life impacts of the desalination pilot operation towards replication.
7.2 Distribute technical information and lessons learnt to technical groups in the public and private sector.	1 752	*Documentation is produced and distributed, and presentations made to government technicians, university staff and consulting engineers.*
Project Activity Cost (A)	**3 792 738**	

Table 39: Annual cash flow for Project Activity Cost (A)

Components and activities	2018 (USD)	2019 (USD)	2020 (USD)	2021 (USD)	Total Budget (USD)
Component 1: Development of pilot desalination plants at Bethanie and Grünau	**2 284 230**	**0**	**0**	**0**	**2 284 230**
1.1 Civil works	**870 940**	**0**	**0**	**0**	**870 940**
Bush clearing of site; fencing of evaporation ponds	130 641	0	0	0	130 641
Construct evaporation ponds	391 923	0	0	0	391 923
Line evaporation ponds	182 897	0	0	0	182 897
Construct roof structures for package plants	104 513	0	0	0	104 513
Professional fees @ 7.5%	60 966	0	0	0	60 966
1.2 Pilot water treatment plant	**1 137 888**	**0**	**0**	**0**	**1 137 888**
Acquire UF/RO pilot package plants	819 280	0	0	0	819 280
Install pilot plants	68 273	0	0	0	68 273
Test and commission plants; train operators	11 379	0	0	0	11 379
Compile manuals; collect and analyse data	125 168	0	0	0	125 168
Acquire spares for piloting	0	11 379	22 758	0	34 134
Professional fees @ 7.5%	79 652	0	0	0	79 652
1.3 Mechanical and electrical works	275 402	0	0	0	**275 402**
Connect plant to existing systems and reticulation	22 032	0	0	0	22 032
Acquire and install pipes, valves and raw water storage	123 931	0	0	0	123 931
Acquire and install flowmeters and instrumentation	82 620	0	0	0	82 620
Acquire and install telemetry/radio communication	27 540	0	0	0	27 540
Professional fees @ 7.5%	19 278	0	0	0	19 278
Component 2: Development of pilot hybrid renewable energy plants at Bethanie and Grünau	**1 486 154**	**0**	**0**	**0**	**1 486 154**
Acquire and install turbines	401 262	0	0	0	401 262

Components and activities	2018 (USD)	2019 (USD)	2020 (USD)	2021 (USD)	Total Budget (USD)
Acquire and install solar fields	549 877	0	0	0	549 877
Acquire and install battery banks (48 V)	312 092	0	0	0	312 092
Acquire and install inverters and BOS	59 446	0	0	0	59 447
Acquire and install electrical & SCADA equipment	14 862	0	0	0	14 862
Acquire and install civil works safety and security system	44 585	0	0	0	44 585
Professional fees @ 7.5%	104 031	0	0	0	104 031
Component 3: Testing and commissioning of plants & training of staff and students	**19 161**	**0**	**0**	**0**	**19 161**
3.1 Test all components and complete systems, correct shortcomings, adjust controls, verify quality of product water.	1 916	0	0	0	1 916
3.2 Provide specialized training to operations and maintenance staff.	8 431	0	0	0	8 431
3.3 Produce training and maintenance manuals, so that information is formalised and can be passed on without loss of content	5 173	0	0	0	5 173
3.4 Involve a gender balanced group of tertiary institution students in all aspects of plant establishment to facilitate knowledge dissemination	3 641	0	0	0	3 641
Component 4: Piloting of the plants at Bethanie and Grünau	**0**	**183 958**	**183 958**	**0**	**367,917**
4.1 Operate, maintain and improve the desalination plants.	0	132 450	132 450	0	264 900
4.2 Operate, maintain and improve the power plants	0	20 235	20 235	0	40 471
4.3 Update the training, operations and maintenance manuals	0	7 358	7 358	0	14 717
4.4 Collect technical and social information, and record lessons learned.	0	16 556	16 556	0	33 113

Components and activities	2018 (USD)	2019 (USD)	2020 (USD)	2021 (USD)	Total Budget (USD)
4.5 Site visits by a gender balanced group of tertiary institution students, to impart knowledge and skills on the plants and the associated social effects on the beneficiaries.	0	7 358	7 358	0	14 717
Component 5: Supply good quality water to the communities at the two project sites during piloting of the plants	**0**	**0**	**0**	**0**	**0**
5.1 Operate and maintain the plants	0	0	0	0	0
5.2 At the end of the piloting period, handover of the infrastructure to NamWater to ensure continuation of water supply.	0	0	0	0	0
Component 6: Sensitise project beneficiaries and local stakeholders at Bethanie and Grünau	**1 825**	**1 825**	**1 825**	**1 825**	**7 299**
6.1 Hold various public meetings and demonstrations to share information.	1 058	1 058	1 058	1 058	4 234
6.2 Directly target children at school with information supply.	219	219	219	219	876
6.3 Use female technical and social students to impart knowledge and skills to community women, and to survey their response to the intervention.	547	547	547	547	2 190
Component 7: Information and knowledge dissemination	**1 369**	**1 369**	**1 369**	**1 369**	**5 474**
7.1 Conduct workshops with community leaders, government officials on local and regional level, and policy- and decisionmakers in the rural water sector to share the project experience and lessons learnt from the project.	931	931	931	931	3 722
7.2 Distribute technical information and lessons learnt to technical groups in the public and private sector.	438	438	438	438	1 752
Project Activity Cost (A)	**3 792 738**	**187 152**	**187 152**	**3 193**	**4 170 235**

Table 40: Budget for Project Execution Cost (B)

Item	Amount (USD)	Budget notes
Management and supervision	**173 799**	
Contractual development and familiarization	5 600	Once-off
Assignment of a project manager to the project	5 600	Once-off
Placement of adverts and appointment of consultants or contractors	5 600	Once-off
Fee for site scientist or engineer	50 000	Involved once a month
Final design of project components	30 000	Once-off
Construction supervision	25 000	During construction period
Implement quality management plan	15 000	Continuous
Implement sustainability and exit plan	18 999	Continuous
Implement communication plan	18 000	Continuous
Data collection	**55 700**	
Sampling for sites establishment	4 500	Once off
Assessment of instrument performance	11 000	Once monthly during construction period
Water quality sampling and analysis	30 000	Once monthly during piloting period
Community perception surveys	5 700	Quarterly during piloting period
Knowledge management and database maintenance	4 500	Monthly inputs during piloting period
Progress meetings and reports	**112 865**	
Inception meeting with key stakeholders	5 000	Once-off
Inception meeting with communities	8 500	Once-off
Communication with community members and stakeholders	5 000	Quarterly
Project meetings with core team	30 000	5 times a year
Project meetings with Technical Advisory Committee	3 500	Bi-annually
Internal quarterly report	30 000	Quarterly
Final report input	4 500	Once off

Mid-term review input	6 000	Once -off
Periodic field survey report	5 400	Quarterly
Catering, venue, and information material	14 965	For meetings and communications
Financials	**40 500**	
Financial/Accounting supervision	7 000	Complete project period
Internal verification and audit preparation	25 000	Twice during project
Bank charges	8 500	Monthly
Other related expenses for the site scientist or engineer	**54 8950**	
Office space and local travels	45 000	Complete project period
Internet access	5 395	Complete project period
Consumables (telephone, stationeries etc.)	4 500	Complete project period
Project Execution Cost (B)	**437 759**	

Table 41: Annual cash flow for Project Execution Cost (B)

Item	2018 (USD)	2019 (USD)	2020 (USD)	2021 (USD)	Total Budget (USD)
Management and supervision	**122 483**	**32 183**	**16 583**	**2 550**	**173 799**
Contractual development and familiarization	5 600	0	0	0	5 600
Assignment of a project manager to the project	5 600	0	0	0	5 600
Placement of adverts and appointment of consultants or contractors	4 700	600		300	5 600
Fee for site scientist or engineer	50 000	0	0	0	50 000
Final design of project components	30 000	0	0	0	30 000
Construction supervision	10 000	15 000			25 000
Implement quality management plan	4 500	4 500	4 500	1 500	15 000
Implement sustainability and exit plan	6 233	6 233	6 233	300	18 999
Implement communication plan	5 850	5 850	5 850	450	18 000
Data collection	**21 467**	**16 967**	**16 967**	**300**	**55 700**

Item	2018 (USD)	2019 (USD)	2020 (USD)	2021 (USD)	Total Budget (USD)
Sampling for sites establishment	4 500	0	0	0	4 500
Assessment of instrument performance	3 667	3 667	3 667	0	11 000
Water quality sampling and analysis	10 000	10 000	10 000	0	30 000
Community perception surveys	1 900	1 900	1 900	0	5 700
Knowledge management and database maintenance	1 400	1 400	1 400	300	4 500
Progress meetings and reports	**42 533**	**35 033**	**28 998**	**6 300**	**112 865**
Inception meeting with key stakeholders	5 000	0	0	0	5 000
Inception meeting with communities	8 500	0	0	0	8 500
Communication with community members and stakeholders	1 667	1 667	1 667	0	5 000
Project meetings with core team	9 400	9 400	9 400	1 800	30 000
Project meetings with Technical Advisory Committee	1 167	1 167	1 167	0	3 500
Internal quarterly report	10 000	10 000	10 000	0	30 000
Final report input	0	0	0	4 500	4 500
Mid-term review input	0	6 000	0	0	6 000
Periodic field survey report	1 800	1 800	1 800	0	5 400
Catering, venue, and information material	5 000	5 000	4 965	0	14 965
Financials	**11 207**	**11 207**	**11 207**	**6 880**	**40 500**
Financial/Accounting supervision	2 223	2 223	2 223	330	7 000
Internal verification and audit preparation	6 250	6 250	6 250	6 250	25 000
Bank charges	2 733	2 733	2 733	300	8 500
Other expenses for the site scientist or engineer	**18 298**	**18 298**	**18 298**	**0**	**54 8950**
Office space and local travels	15 000	15 000	15 000		45 000
Internet access	1 798	1 798	1 798		5 395
Consumables (stationery, copies, etc.)	1 500	1 500	1 500		4 500
Project Execution Cost (B)	**215 988**	**113 688**	**92 053**	**16 030**	**437 759**

Table 42: Budget for Project Management Fee (C)

Budget category	Budget purpose	Budget (USD)	Budget note
1. Management	Overall project coordination Financial management Performance management Information and reporting management Project support to EE	197 231	1
2. Operations	Travel Per diem Progress meetings Oversight and governance workshops	44 699	2
3. Office services and supplies	Utilities Telecommunications Office supplies	61 797	3
4. Auditing and consulting services	Auditing Project evaluation Technical support	66 538	4
5. Knowledge dissemination	Information distribution Reporting	21 415	5
Project Management Fee (C)		**391 680**	

Table 43: Budget notes for Project Management Fee (C)

Budget notes
Budget category 1: Management Salaries or part thereof for Project coordinator, Financial officer, Internal auditor and Administrative clerk who execute or participate in the following management functions: 1. Overall project coordination, including to: • Manage the relationship with the AF and ensure AF satisfaction with project execution in terms of outputs and outcomes, funding utilization, project execution period and reporting • Ensure that all key project partners (DA, NIE, EE, consultants) have a full understanding and ownership of the project, and clearly understand their respective roles and responsibilities • Establish and maintain an overall schedule for project execution, management, monitoring, evaluation and reporting activities • Establish clear guidelines as to requirements and procedures that will apply to implementation of program activities, including reporting, grievance handling, disbursements, virements, etc. • Ensure satisfactory stakeholder involvement and participation 2. Financial management, to: • Ensure budgetary control, compliance with accepted accounting standards and financial control processes, and financial transparency • Manage, monitor and track AF project funding, which includes ensuring cost-effective procurement processes; disbursement of funds to the EE according to agreed work plans, time-bound milestones and achieved outcomes; monitoring of EE expenditure,

Budget notes
with specific emphasis on gender-responsive activities; financial reporting to the AFB; and the return of unspent funds to the AF • Ensure that financial management practices comply with AF requirements • Ensure that financial reporting complies with AF requirements • Appoint external auditors for auditing of NIE and EE accounts 3. Performance management, to: • Monitor and track project execution at the office and in the field to ensure that activities are carried out and objectives in terms of outcome indicators are achieved within the agreed time schedule, with specific emphasis on gender-responsive activities • Assist the EE to identify and implement risk management strategies and to implement corrective measures should project execution be threatened in terms of scope, budget, or schedule • Provide guidance to the EE in establishing performance measurement processes • Chair meetings of the TAC to maintain stakeholder support and to obtain advice on matters that influence successful project execution • Identify, appoint, and support execution of mid-term and final project evaluation 4. Information and reporting management, including: • Maintaining information management systems and specific project management databases to track and monitor project information • Distribution of information, newsletters, regular updates and reports on the project using various media • Ensuring compilation and submission of annual reports to the AF 5. Project support to the EE, including: • Policy compliance support (e.g. International conventions, AF, GRN, DA) as well as DRFN's ESG Policy • Provision of guidance on AF procedures and requirements pertaining to various areas • Support and advice on programming, implementation, troubleshooting, evaluation and reporting
Budget category 2: Operations
• Expenditure on: • 4x4 vehicle lease and fuel • Staff accommodation and daily allowance • Venue and catering cost • Meeting and workshop material • • incurred in executing the following activities: • Project site monitoring and evaluation (over and above visits in combination with EE) • Hosting and attending meetings and workshops
Budget category 3: Office services and supplies

Budget notes
Expenditure on: • Municipal services (water, electricity sewage and waste removal) • Telephone, cell phone and internet services • Banking fees • Stationery, copies and prints
Budget category 4: Auditing and consulting
Expenditure on: • Fees for annual and final audit carried out by auditing firm • Fees and costs for consultant to do mid-term and final project review • Fees for consultant to render policy compliance support (International conventions, AF, GRN, DA, DRFN's mandate)
Budget category 5: Knowledge dissemination
Expenditure on: • Distributing information, newsletters, regular updates and reports on project work and progress using NIE webpage, social media and print media

Table 44: Annual cash flow for Project Management Fee (C)

Budget category/Cost item	2018 (USD)	2019 (USD)	2020 (USD)	2021 (USD)	Total Budget (USD)
Management fees	**49 308**	**49 308**	**49 308**	**49 308**	**49 308**
Project coordinator	19 462	19 462	19 462	19 462	77 846
Administrative staff	7 385	7 385	7 385	7 385	29 538
Financial officer (H/R)	10 462	10 462	10 462	10 462	41 846
Internal auditor	12 000	12 000	12 000	12 000	48 000
Operating expenditure	**12 224**	**11 175**	**11 175**	**4 741**	**44 699**
Vehicle lease	1 047	698	698	349	2 791
Fuel	1 408	938	938	469	3 754
Accommodation & per diem	692	462	462	231	1 846
Progress meetings	3 692	3 692	3 692	3 692	14 769
Venue & catering & material	5 385	5 385	5 385	5 385	21 538
Office services and supplies	**15 449**	**15 449**	**15 449**	**15 449**	**61 797**
Water, electricity, property tax	3 988	3 988	3 988	3 988	15 951
Telecom, internet and IT services	5 538	5 538	5 538	5 538	22 154
Banking fees	923	923	923	923	3 692
Stationery, copies, prints	5 000	5 000	5 000	5 000	20 000
Auditing and consulting services	**12 846**	**12 000**	**19 923**	**21 769**	**66 538**
Annual audit	6 923	6 923	6 923	0	20 769
Final audit	0	0	0	8 462	8 462
Consulting services (policy compliance support)	5 923	5 077	3 385	2 538	16 923
Mid-term revue (external evaluator)	0	0	9 615	0	9 615
Final revue (external evaluator)	0	0	0	10 769	10 769
Knowledge dissemination					
Web page, social and print media	5 354	5 354	5 354	5 354	21 415
Project Management Fee (C)	**95 181**	**93 285**	**101 209**	**102 006**	**391 680**

H. Disbursement schedule

Table 45: List of project milestones

Milestones	Expected dates
Signature of agreement between AF and NIE	March 2018
Start of project (Inception workshop)	April 2018
Inception report (1 month after inception workshop)	May 2018
End of execution Year 1	March 2019
Annual Performance Report 1 - PPR 1 (within 2 months of end Year 1)	May 2019
End of execution Year 2	March 2020
Annual Performance Report 2 – PPR 2 (within 2 months of end Year 2)	May 2020
Mid-point of project implementation	October 2020
Mid-term evaluation report (within 6 months of mid-point)	April 2021
End of execution Year 3	March 2021
Annual Performance Report 3 – PPR 3 (within 2 months of end Year 3)	May 2021
End of execution Year 4	March 2022
Project implementation completion	March 2022
Annual Performance Report 4 - PPR 4 (within 2 months of end Year 4)	May 2022
Terminal evaluation report (aimed for 3 months after project completion)	June 2022
Project completion report (within 6 months of project completion)	September 2022
Project closing (6 months post project completion, disbursement completed)	September 2022
Final audited financial statements (aimed for 3 months after end of NIE FY)	March 2023

Table 46: Disbursement schedule

Payment milestone	Scheduled date	Activities Cost (A)	Execution Cost (B)	Management Fee (C)	Total Disbursement (A+B+C)
Signature of agreement	March 2018	3 812 059	215 988	95 181	**4 123 228**
PPR 1 submission	May 2019	175 620	113 688	93 285	**382 593**
PPR 2 submission	May 2020	139 531	92 053	101 209	**332 793**
PPR 3 submission	May 2021	43 024	16 030	102 006	**161 060**
Total project		**4 170 234**	**437 759**	**391 681**	**4 999 674**

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PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT[1]

Mr. Teofilus Nghitila Environmental Commissioner, Ministry of Environment and Tourism, Namibia	Date: 28 July 2017 Signature:

MINISTRY OF ENVIRONMENT AND TOURISM
P/Bag 13306
Windhoek, Namibia
2017 -07- 28
Office of the
Environmental Commissioner

B IMPLEMENTING ENTITY CERTIFICATION

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans namely National Development Plan 5, National Policy on Climate Change for Namibia 2011 and National Climate Change Strategy and Action Plan 2013-2014 and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project.	
Martin Schneider National Implementing Entity Desert Research Foundation of Namibia (DRFN)	
Date: 27 July 2017	Tel.: +264-81-2460379 E-Mail: martin.schneider@drfn.org.na
Project Contact Person: Dr. Martin B. Schneider	
Tel.: +264-81-2460379, or +264-61-377500 E-Mail: martin.schneider@drfn.org.na	

1. [6.] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel: (00 26461) 284 2111
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Enquiries: Mr. P. Mulenga

Cnr Robert Mugabe &
Dr Kenneth Kaunda Street
Private Bag 13306
Windhoek
Namibia

28 July 2017

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Dear Sir/Madam

SUBJECT: ENDORSEMENT OF THE FULLY DEVELOPED PROPOSAL FOR THE PROJECT "PILOT RURAL DESALINATION PLANTS USING RENEWABLE POWER AND MEMBRANE TECHNOLOGY"

In my capacity as Designated Authority for the Adaptation Fund in Namibia, I am pleased to endorse the project **"Pilot rural desalination plants using renewable power and membrane technology"** having a total funding requirement of USD 4 999 386.

NamWater has developed the project proposal as Executing Entity under the management and guidance of the Desert Research Foundation of Namibia (DRFN) as the accredited NIE for Namibia.

Sincerely Yours,

MINISTRY OF ENVIRONMENT AND TOURISM
Private Bag 13306
Windhoek, Namibia
2017 -07- 28
Office of the Environmental Commissioner

Mr. Teofilus Nghitila
Environmental Commissioner

"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

ANNEXURES

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Annexure 2: Undertaking by NamWater to take over responsibility for the desalination plants upon project completion

Annexure 3: Stakeholder consultation and disclosure plan

Annexure 4: Social Stakeholder Engagement Report: Bethanie

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Annexure 8: Grievance mechanism

Annexure 9: Letter of support from MAWF

Annexure 10: Environmental clearance for the proposed pilot desalination plant at Bethanie

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Annexure 1: Water quality guidelines and standards for potable water

Table 1. Water Quality Guidelines and Standards for Potable Water

Specifications for water quality intended for human consumption from the source and piped water supply					
Status				**Ranges and upper limits**	
Interpretation				**(Ideal guideline)**	**(Acceptable Standard)**
DETERMINANTS	**Unit**	**Format**	**Concern**	**95 Percentile Requirement**	
PHYSICAL AND ORGANOLEPTIC REQUIREMENTS					
Temperature	**° C**		**E**	**Ambient temperature**	
Colour	**PTU**	**or mg/litre**	**E**	**10**	**<15**
Taste			**O,E**	**No objectionable taste**	
Odour			**O,E**	**No objectionable odour**	
Turbidity (treated surface water)	**NTU**	**or TU**	**H,I**	**< 0,3**	**< 0,5**
Turbidity (groundwater)	**NTU**	**or TU**	**H,I**	**< 0,5**	**<2**
pH @ 20 °C	**pH**		**I**	**6.0 to 8,5**	**6 to 9**
Electric Conductivity @ 25 °C	**mS/m*** **	**E.C.**	**H,I**	**< 80**	**< 300**
Total Dissolved Solids	**mg/litre**		**H,I**	**< 500**	**< 2 000**
INORGANIC MACRO DETERMINANTS					
Ammonia	**mg/litre**	**N**	**H**	**< 0.2**	**< 0.5**
Calcium	**mg/litre**	**Ca**	**I**	**< 80**	**< 150**
Chloride	**mg/litre**	**Cl**	**H,I**	**< 100**	**< 300**
Fluoride	**mg/litre**	**F**	**H**	**< 0.7**	**< 2,0**
Magnesium	**mg/litre**	**Mg**	**H**	**< 30**	**< 70**
Nitrate	**mg/litre**	**N**	**H**	**< 6**	**< 11**
Nitrite	**mg/litre**	**NO_2**	**H**	**< 0.2**	**< 0.5**
Potassium	**mg/litre**	**K**	**H**	**< 25**	**< 100**
Sodium	**mg/litre**	**Na**	**H.I**	**< 100**	**< 300**
Sulphate	**mg/litre**	**SO_4**	**H,O**	**100**	**< 300**
Asbestos (fibres longer than 10 µm)	**Fibres/litre**		**H**	**<500 000**	**< 1000 000**
INORGANIC MICRO DETERMINANTS					
Aluminium	**µg/litre**	**Al**	**H**	**< 25**	**< 100**
Antimony	**µg/litre**	**Sb**	**H**	**< 5**	**< 50**
Arsenic	**µg/litre**	**As**	**H**	**<10**	**< 50**
Barium	**µg/litre**	**Ba**	**H**	**0,5**	**< 2**
Beryllium	**µg/litre**	**Be**	**H**	**< 2**	**< 5**
Bismuth	**µg/litre**	**Bi**	**H**	**< 250**	**< 500**
Boron	**µg/litre**	**B**	**H**	**< 300**	**< 500**
Bromide	**µg/litre**	**Br**	**H**	**< 500**	**< 1 000**
Cadmium	**µg/litre**	**Cd**	**H**	**< 5**	**< 10**
Cerium	**µg/litre**	**Ce**	**H**	**<1 000**	**<2 000**
Cesium	**µg/litre**	**Cs**	**H**	**< 1 000**	**< 2 000**
Chromium Total	**µg/litre**	**Cr**	**H**	**< 50**	**< 100**
Cobalt	**µg/litre**	**Co**	**H**	**< 250**	**< 500**
Copper	**µg/litre**	**Cu**	**H**	**< 500**	**< 2 000**

Specifications for water quality intended for human consumption from the source and piped water supply					
Status				**Ranges and upper limits**	
Interpretation				**(Ideal guideline)**	**(Acceptable Standard)**
DETERMINANTS	**Unit**	**Format**	**Concern**	**95 Percentile Requirement**	
INORGANIC MICRO DETERMINANTS					
Cyanide (free)	**µg/litre**	**CN^-**	**H**	**< 20**	**< 50**
Cyanide (recoverable)	**µg/litre**	**CN^-**	**H**	**< 70**	**< 200**
Iron	**µg/litre**	**Fe**	**H,E**	**< 200**	**< 300**
Lead	**µg/litre**	**Pb**	**H**	**<10**	**< 50**
Manganese	**µg/litre**	**Mn**	**H**	**< 50**	**< 100**
Mercury	**µg/litre**	**Hg**	**H**	**< 1**	**<2**
Nickel	**µg/litre**	**Ni**	**H**	**< 50**	**< 150**
Selenium	**µg/litre**	**Se**	**H**	**< 10**	**< 50**
Thallium	**µg/litre**	**Ti**	**H**	**< 5**	**< 10**
Tin	**µg/litre**	**Sn**	**H**	**<100**	**<200**
Titanium	**µg/litre**	**Ti**	**H**	**< 100**	**< 300**
Uranium	**µg/litre**	**U**	**H**	**< 3**	**< 15**
Vanadium	**µg/litre**	**V**	**H**	**< 100**	**< 500**
Zinc	**µg/litre**	**Zn**	**H**	**< 1 000**	**< 5 000**
Organo-metallic compounds	**µg/litre**	**-**	**H**	**below detection limit**	**below detection limit**
ORGANIC DETERMINANTS					
Dissolved Organic Carbon	**mg/litre**	**DOC-C**	**H**	**< 5**	**<10**
Phenol compounds	**µg/litre**	**phenol**	**H**	**< 5**	**< 10**
DISINFECTION AND DISINFECTION BY-PRODUCTS					
Bromodichloromethane (Part of THM)	**µg/litre**		**H**	**< 20**	**< 50**
Bromoform (Part of THM)	**µg/litre**		**H**	**< 40**	**< 40**
Chloroform (Part of THM)	**µg/litre**		**H**	**< 20**	**< 100**
Dibromomonochloro-methane (Part of THM)	**µg/litre**		**H**	**< 20**	**< 100**
Trihalomethanes (Total)	**µg/litre**	**THM**	**H**	**< 100**	**< 150**
Bromate	**µg/litre**		**H**	**< 5**	**< 10**
Chloramines	**µg/litre**	**Cl_2**	**H**	**< 2**	**< 4**
Chlorine dioxide	**µg/litre**		**H**	**< 400**	**< 800**
Chlorite	**µg/litre**		**H**	**< 400**	**< 4000**
Chlorate	**µg/litre**		**H**	**< 200**	**< 700**
Haloacetic acids	**µg/litre**		**H**	**not detected**	**< 60**
Chlorine, free, after 30 min; GENERAL	**mg/litre**	**Cl_2**	**H,I**	**0,1 – 0,5**	**0,1 - 3,0**
Chlorine, free, after 30 min; SPECIFIC	**mg/litre**	**Cl_2**	**Turbidity: < 0,3 NTU**	**0,1**	**0,1 - 3,0**
Chlorine, free, after 30 min; SPECIFIC	**mg/litre**	**Cl_2**	**Turbidity: > 0,3 NTU**	**0,5**	**0,1 - 3,0**
Chlorine, free, after 60 min; SPECIFIC	**mg/litre**	**Cl_2**	**Turbidity: >1,0 NTU**	**1,0**	**0,1 - 3,0**

Specifications for water quality intended for human consumption from the source and piped water supply					
Status				**Ranges and upper limits**	
Interpretation				**(Ideal guideline)**	**(Acceptable Standard)**
DETERMINANTS	**Unit**	**Format**	**Concern**	**95 Percentile Requirement**	
BIOLOGICAL REQUIREMENTS					
Algae					
Chlorophyll α	**µg/litre**		**E,O**	**< 1**	**< 2**
Blue-green algae	**cells**	**/ml**	**H,O**	**< 200**	**<2 000**
Mycrocystin	**µg/litre**		**H**	**< 0.1**	**< 1**
Geosmin	**ηg/litre**		**E, H**	**< 15**	**< 30**
2-Methyl Iso Borneal (2 MIB)	**ηg/litre**		**E, H**	**< 15**	**< 30**
OTHER DETERMINANTS					
Agricultural chemical compounds			**H**	**Any organic compound recognized as an agro-chemical should be in accordance with the WHO and EPA requirements.**	
Industrial chemical compounds			**H**	**Any organic compound recognized as an industrial chemical should be in accordance with the WHO and EPA requirements.**	
Endocrine disruptive chemicals			**H**	**Any chemical compound that is suspected of having endocrine disruptive effects shall be in accordance with the WHO and EPA requirements.**	
RADIOACTIVITY				**95 Percentile Requirement**	
Gross alpha activity	**Bq/litre**		**H**	**< 0.2**	**< 0.5**
Gross beta activity	**Bq/litre**		**H**	**< 0.4**	**< 1.0**
If Gross alpha and beta is above specification calculate Dose based on individual radionuclide concentrations	**mSv/a**		**H**	**≤ 0.04**	**≤ 0.1**
ANALYSIS QUALITY CHECK* **					
Ion balance: Total anions			**-**	**< 3 -Tolerance = 0.2 m equivalent 3-10 – Tolerance 2% on +- balance 10-800 – Tolerance 5% on +- balance**	
TDS Balance: determined / calculated	**ratio**		**-**	**~ 1**	**~ 1**
Ratio TDS / EC (EC as □S/cm)	**ratio**		**-**	**~ 0,66**	**0,55 – 0,7**

"Concern" refers to impact if the limit is transgressed: H = health concern; O = organoleptic effect;
I = effect on infrastructure, structural; E = aesthetic effect

* Based on a viral cell culture-dependent method and not on cell culture-independent methods (e.g. PCR)

** Indicative of faecal pollution having occurred, even when the residual disinfectant levels are safe.

*** Comply with SANAS Guidelines

Table 2: Microbiological and Biological Requirements

MICROBIOLOGICAL REQUIREMENTS APPLICABLE TO ALL POTABLE WATER					
Microbiology	**cfu**			**95 percentile**	**1 of samples maximum**
Heterotrophic bacteria HPC or TCC	**counts**	**/ml**		**100 at 37^0 C**	**1 000 at 37^0 C**
Total Coliform	**counts**	**/100 ml**	**H**	**0**	**5**
E.Coli	**counts**	**/100 ml**	**H**	**0**	**1**
Entrerococci	**counts**	**/100 ml**	**H**	**0**	**1**
Somatic Coliphage	**counts**	**/100 ml**	**H**	**0**	**1**
Clostridium perfrigens inclusive spores	**counts**	**/100 ml**	**H**	**0**	**1**
Enteric viruses	**viral count***	**/10 L**	**H**	**0**	**1**
Parasites (Protozoa) applicable to all potable water				**95 percentile**	**99 percentile**
Giardia lamblia	**cysts**	**/100 litre**	**H**	**0**	**1**
Cryptosporidium	**oocysts**	**/100 litre**	**H**	**0**	**1**
Giardia lamblia and Giardia lamblia (Grab sample)	**cysts or oocysts**	**/10 L**	**H**	**0**	**0**

Table 3: Special Requirements for the Protection of Infrastructure

Specifications for water quality intended for human consumption from the source and piped water supply for the protection of infrastructure against corrosion					
Status				**Ranges and upper limits**	
Interpretation				**(Ideal guideline)**	**(Acceptable Standard)**
DETERMINANTS	**Unit**	**Format**	**Concern**	**95 Percentile requirement**	
CORROSIVE AND SCALING PROPERTIES					
Calcium Carbonate Precipitation Potential	**mg/litre**	**CCPP**	**I**	**4 - 5**	**3 - 6**
Alkalinity/Sulphate/ Chloride Ratio	**Equi-valents**	**Corrosivety Ratio**	**I**	**With SO_4 and Cl above 50 mg/litre Ratio=(Alk/50)/(SO_4/48+Cl/35.5) > 5.0 Water is Stable Ratio= (SO_4/48+Cl/35.5)/(Alk/50) > 0.2 Water is Corrosive**	
Total Hardness (Ca & Mg)	**mg/litre**	**$CaCO_3$**	**I**	**<200**	**< 400**

Table 4: Frequency of Microbiological Monitoring for Bulk Water Supply

Size of population served	Turbidity 95%**	Frequency of sampling
> 250 000	< 0,5 NTU	**Thrice weekly *** **
100 001 – 250 000	< 1,0 NTU	**Twice weekly**
50 001 – 100 000	< 1,0 NTU	**Once weekly**
10 001 – 50 000	< 1,0 NTU	**Three times every month**
< 10 000 reticulated	< 1,0 NTU	**Once every 1 month***
< 10 000 non-reticulated	**1 – 2 NTU**	**Once every 1 month***

* Upon complaints by the consumers or of medical practitioners and after incidents such as pipe breaks, the frequency should be increased until the situation has returned to original counts and been declared safe;

** Average or 95 percentile turbidity of the water supplied

*** The frequency should be stepped up by one extra sampling per week for every 100 000 residents (including the estimated number of visitors residing within the area at any time) in the area served, over and above 250 000.

General Information

1. The area being monitored shall be defined by the Minister in consultation with the Minister responsible for health and, where applicable, relevant officials from the Regional and Local Authorities;
2. At the time of sampling the operator shall also take a “free chlorine” reading of the same water under examination but prior to sampling for microbiological sampling, whilst using a portable device designed for that purpose and accepted by the Minister; this ‘reading’ is to be recorded and reported together with the results from the microbiological analyses;
3. As for field ‘screening’ of water supplies for microbiological contamination there exist portable devices designed for that purpose and accepted by the Minister; these ‘readings’ are to be recorded and reported together with the results from the microbiological analyses;
4. The results of the microbiological monitoring together with the free chlorine readings is to be reported as per mutual agreement to the ultimate supplier (bulk water supplier, Local Authority, or any other supplier) for remedial action where required, and to the Minister for record and monitoring purposes and follow up actions;
5. The costs of routine monitoring shall be borne by the authority commissioning the monitoring;

Methodology for Sampling and Anlyses

The methodologies followed for sampling and during transit and storage of samples prior to analysis shall be as prescribed.

1. Preferably samples are to be taken in borosilicate glass bottles with a glass or polypropylene screw-cap lid;
2. Where this is not feasible or practical polyethylene bottles with internal seal and with screw-lid can be used;
3. Samples shall, as far as practical, be analysed within 24 hours of sampling;
4. Where there are special requirements for the period between sampling and analysis to be less than 24 hours, such requirement should be attended to as far as is practical;
5. Samples are to be kept and stored, even during transit, at as low a temperature as is practically manageable, whilst preventing the risk of the sample freezing;
6. The sample shall be kept away from light and shielded from sunlight, to reduce chances of micro-/biological growth to a minimum;
7. The use of preservation chemicals should be considered, planned and executed with extreme care;
8. Where sample preservation is appropriate or required an extra smaller volume sample should be taken so as to not upset any other analyses that are affected by the preservation chemical(s);
9. Certain determinants may be monitored ‘in the field’ at the time of sampling; such field-data are to be measured in a receptacle or container different from the sample container; data so obtained shall be recorded as “field measurement” and cannot replace laboratory analysis for the parameters concerned;
10. The methodologies followed for physical, chemical and microbiological analysis shall be in agreement with the specifications listed in the latest edition of the SANS 241, Drinking Water Standards, published by the SABS.
11. The cost of routine, regulatory inspections and monitoring, for the purpose of fulfilling the provisions of this regulation shall borne by the service provider.

Annexure 2: Undertaking by NamWater to take over responsibility for the desalination plants upon project completion

NAMWATER
Namibia Water Corporation Ltd

atusha

LETTER OF UNDERTAKING

30 June 2017

To: Adaptation Fund Board

C/O Adaptation Fund Board Secretariat

Email: secretariat@adaptation-fund.org

Fax: 202 522 3240/5

Subject: Letter of undertaking of responsibility of the proposed pilot Desalination Plants with Renewable Energy and Membrane Technology in Namibia

Namibia Water Corporation (NamWater) Ltd as an **Executing Entity** of the proposed "***Pilot desalination Plants with Renewable Energy and Membrane Technology" Project in Namibia*** hereby agree to undertake full responsibility of the pilot project after the successful piloting phase (i.e. Phase 1).

The piloting is proposed to take place at the existing NamWater's water supply schemes located in the village/settlement of Grünau and Bethanie.

We confirm that the information provided in the project proposal submitted to you for funding is correct and up to date.

Sincerely

DR VP Shivute
Chief Executive Officer
Namibia Water Corporation Ltd
Date: 30/06/2017

Annexure 3: Stakeholder consultation and disclosure plan

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY

Stakeholder Consultation and Disclosure Plan (PCDP)

Namibia Water Corporation Ltd in collaboration with the Desert Research Foundation of Namibia (DRFN)

Reference: Project number

Revision: 2

7 June 2017

aurecon

Bringing ideas to life

Document control record

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Current revision		**2**				

Approval			
Author signature		Approver signature	
Name	Noeleen Greyling	Name	Tebogo Sebego
Title	Social Scientist	Title	Associate

Contents

Appendices

Figures

Tables

1 Introduction

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes. A successful demonstration of the methods will enable further roll-out to other sites in the country.

the Namibia Water Corporation Ltd as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology. In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through screening process
2) Environmental, social, and gender assessment (ESIA) – only risk identification at this stage
3) Environmental and social management plans (ESMP)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – data gathering
5) Stakeholder disclosure and consultation (stakeholder engagement)
6) Grievance mechanism developed

This documents refers to the stakeholder engagement process related to the six (6) steps as outlined in the Environmental and Social Management System (ESMS) manual. The outcomes of the stakeholder engagement from this study will be used to inform the reports generated for the above-mentioned steps.

The baseline social conditions of a community are the existing conditions and past trends associated with the human environment and their area of influence in which the proposed activity is to take place. Assessing proposed developments in a socio-economic context will help both the developer and affected community to identify potential social equity issues, evaluate the adequacy of social services and determine whether the project may adversely affect overall social well-being. Focus group discussions assist in identifying these social conditions and the socio-economic context of the proposed project.

A focus group discussion is a guided discussion involving a small number of people (between 5 and 20) sharing a common characteristic (e.g. belonging to the same socio-professional group, etc.). These discussions will address socio-economic topics relating to socio-economic impacts based on projects and initiatives of common interest to stakeholders, and issues raised during discussion will be recorded

and subject to qualitative analysis. Data from these discussions will assist in updating socio-demographic information, as well as allowing a forum for community initiatives to be discussed with relation to socio-economic impacts.

Through the focus groups relatively dependable data can be gathered within a short time frame. Effective consultation and engagement is a vehicle that will be used to build more resilient relationships with affected stakeholders and communities. It will lead to the identification of perceived social impacts that the proposed project may have on these communities as well as possible mitigation measures, which will inform the overall study.

Aurecon has framed the Stakeholder Consultation and Disclosure Plan on the International Association for Stakeholder Participation which refers to an increasing level of participation ranging from 'inform', 'consult', 'involve', 'collaborate' to 'empower'.

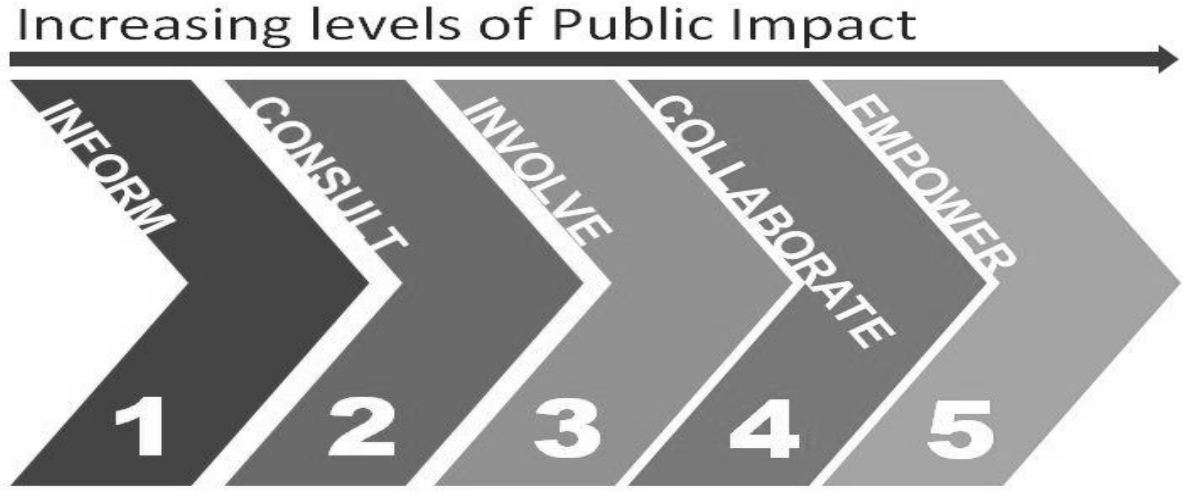

Figure 1: Engagement spectrum

1.1 Background about the engagement elements

The following engagement elements are listed and explained:

1.1.1 Information

Sharing information with stakeholders is undertaken to gain a mutual understanding of assets or understand what is proposed or why a decision has been made. Inform is the appropriate level of engagement when the aim is to provide information about a decision or outcome, which it was made by and what the consequential impact on stakeholders and the community will be. Fact sheets can be provided to give background.

1.1.2 Consultation

Consult is the appropriate level of engagement when input, view or feedback is sought from the stakeholders to better inform a decision-making process, or to help inform the direction of a proposed strategy, plan or project. Consult is selected when the project team asks and listened to the stakeholders to improve something, to obtain views on a particular proposal, understand what would happen if the project team made a certain decision, or when a number of possible options are provided and which option is preferred.

1.1.3 Involve / Participation

Involve is the appropriate level of engagement when local input is required to identify risks early and to inform the planning process. This level of engagement is selected when the stakeholders are included early in the planning process to ensure all concerns and aspirations are both heard and understood. This results in building connected networks and relationships, ownership and trust through active involvement.

1.1.4 Collaboration / Partner

Collaborate is the appropriate level of engagement when the project team mutually share the decision-making with various levels of government, community groups, key stakeholders or members of the public. Collaboration is usually selected where solutions are unclear and teamwork with equal power and partnership are needed to find solutions that lead to an agreed outcome. The sharing of information, questions or positions to obtain ideas, feedback, knowledge or an understanding of objectives and expectations are common to this phase.

1.1.5 Empowerment / Ownership

Empower is the team's promise to implement what has been decided. Empowerment is selected when the community and stakeholders are provided with the skills, information, authority and resources in order to make the final decision. Individuals and stakeholders must have capacity to understand risk and accept responsibility and implement initiatives.

2 Benefits of engagement for the Client

- Community and stakeholder input will improve the quality of project being implemented, making it more practical and relevant.
- Community and stakeholder input can ensure that social beneficiation is delivered in a more effective and efficient way for affected stakeholders and communities.
- Engaging with communities is a way for the Client to check the well-being of the relationship face-to-face. It can also explore ways in which the Client and stakeholders could work more closely on issues of concern to the communities.

- Engaging with communities is an opportunity for the Client to check its reputation status. Asking the community how the Client is meeting local needs could be a positive or at least informative engagement exercise.
- Early notice of emerging issues puts the Client in a better position to deal with those issues in a proactive way, instead of reacting as anger and conflict arise.
- Good engagement enhances the reputation of the Client as open, accountable and willing to listen.

3 Benefits for engagement for stakeholders and communities

- With purposeful and well-planned engagement, there will be opportunities for a diversity of voices to be heard on issues which matter to people.
- The stakeholders have an opportunity to provide local information that could be unknown and of benefit to the Client.
- Communities can expect the Client to meet certain standards of engagement and give feedback on its ability to meet those standards.
- Communities are able to identify their priorities for themselves.
- There may be more ownership of solutions to current problems or building plans for the future so that the community shares in decision-making and has a higher level of responsibility for creating that future.
- Engagement can foster a sense of belonging to communities and considerable benefits from working together on behalf of the communities.
- Individuals and groups may become empowered and proactive with regards to issues that affect them.

4 Methodology

4.1 Planning and preparation

4.1.1 Stakeholder identification

The first step is to identify stakeholders i.e. determining who the project stakeholders are as well as their key groupings and sub-groupings. Careful identification of local peoples' representatives is an essential part of preparation for the consultation process. When selecting representatives, it may be useful to consider the following:

- Who are the elected officials of the territorial jurisdictions impacted by the project or measure? To what extent do these authorities adequately represent local peoples?

- Who are the traditional leaders of the local peoples?
- Given that local communities are not necessarily homogenous, are there groups, such as women, youth, and agricultural, who are not represented by either of the above?
- Are parallel communications needed for these groups?

The following council representatives have been identified and will participate in the focus group sessions: Bethanie Village Council, Grunau Village Council and Epukiro Post 3 Village Council.

4.1.2 Choosing dates and venues

It will be important to choose a venue where stakeholders feel more comfortable - most likely at a location within the community as this tend to have more productive engagement processes, for the following reasons:

- It lends **transparency** to the process. Community members can witness the process and stay informed about what is being discussed on their behalf, and what has been agreed at the close of consultation or negotiations.
- It increases **accountability** of local leaders. Community members will know what they are entitled to demand, and they will be able to monitor its delivery and avoid corruption.
- It sends the **message that the input of communities** are valued enough to travel there and spend time with them
- It contributes to community members' feeling of **ownership over the engagement process**. Community members say that the opportunity to have input into stakeholder meetings gives them a sense of having a role in the outcome of decisions.
- Finally, it allows community members to **identify their own representatives**, preventing illegitimate representatives from claiming that they speak for communities.

4.1.3 Stakeholder notification

Stakeholders identified and included in the stakeholder database will be notified of the relevant meetings either by formal letters, email, posters and phone.

The meetings will be held as follow:

Monday, 12 June 2017 at;

- Grunau Town Council Hall @ 14H00 – Authorities such as Councillors, Headmen, Traditional Leaders
- Grunau School Hall @ 16H30 – Local businesses, entrepreneurs, related others

Tuesday, 13 June 2017 at;

- Grunau School Hall @ 08H30 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

Tuesday, 13 June 2017 at;

- Bethanie Town Council Hall @ 15H00 – Authorities such as Councillors, Headmen, Traditional Leaders

Wednesday, 14 June 2017 at;

- Bethanie School Hall @ 08H00 – Local businesses, entrepreneurs, related others
- Bethanie School Hall @ 10H00 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

Thursday, 15 June 2017 at;

- Epukiro Post 3 Regional Councillor Hall @ 11H00 – Authorities such as Councillors, Headmen, Traditional Leaders
- Epukiro Post 3 School Hall @ 14H00 – Local businesses, entrepreneurs, related others
- Epukiro Post 3 School Hall @ 16H30 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

4.1.4 Focus group materials

It is not only important to choose a venue where stakeholders feel comfortable at but also to use appropriate level and type of meeting materials that the participants will understand and feel comfortable with and that will allow for maximum participation.

When deciding on which materials to use during focus group meetings the following must be taken into account: audience, venue, equipment available, timeframe and desired outcomes.

To ensure the focus group sessions will have maximum participation and provide best results, the following meeting materials will be used: posters mapping the site and surrounding areas as well as presentation handouts. A digital presentation is not recommended as not all venues will have the necessary services to run them, the presentation handouts will also give the participants the opportunity to take home the information that they have been given in the focus group meetings. However, a digital presentation will be used where possible.

4.2 Outline of focus group meetings

The focus group session will be structured sessions facilitated by a social scientist. Aurecon will prepare the attendance register, background information as well as facilitate the focus group meetings and record the meetings and issue meeting records.

The following draft agenda for meeting with Councillors etc. will be used for the focus group meetings.

Topic	**Speaker**
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater
Perception activity Current water situation and attitude towards project	Aurecon
Discussion session Perceived positive and negative project impacts (construction and operational phase)	Aurecon
Information gathering Vulnerable and disadvantaged groups: Community structures and protocols	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/ Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials will be utilised as well as the envisaged outcome.

- **Project introduction**

  Facilitation method: project overview and discussion session.

  Materials: maps and handouts with information (background information) regarding the project.

  Outcome: to inform stakeholders about the project.

- **Perception activity**

  Facilitation method: initiating discussion over project perception

  Meeting materials: cards

  Outcome: to obtain general knowledge and attitude towards the project

- **Discussion session – current issues as well as perceived project impacts (construction & operational phase)**

  Facilitation method: discussion session

  Materials: flip chart and pens

  Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

- **Discussion session – vulnerable and disadvantaged groups**

  Facilitation method: discussion session

  Materials: flipchart and pens

  Outcome: to identify / name vulnerable and disadvantaged groups. To identify perceived impacts of project on groups as well as recommendations on how to include these groups as well as how these groups can benefit from project. For this project, it will be very useful to compile socio-economic information and to collect socio-economic data in advance to ensure that the stakeholder engagement activities are culturally appropriate from the outset, and that the groups most vulnerable or potentially disadvantaged by the proposed project are identified early on.

- **Community structures and protocol**

  Facilitation method: information gathering

  Meeting materials: flipchart and pens

  Outcome: obtain names and contact details of current organisations and structures in communities (will assist with the next phases of the project). Identify protocol for dissemination of information as well as protocol to deal with grievances (current structure in communities as well as recommended for project.

- **Way forward**

  Closing date: 20 June to provide any comments and information.

  Meeting materials: BIDs to distribute.

The following draft agenda for meeting with other stakeholders. will be used for the focus group meetings.

Topic	Speaker
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater

Story telling Current water situation: risks and impacts (positive and negative): gender, vulnerability etc.	Aurecon
Discussion session Perceived positive and negative project impacts (construction and operational phase)	Aurecon
Information gathering Environmental and social survey	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/ Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials will be utilised as well as the envisaged outcome.

- **Project introduction**

  Facilitation method: project overview and discussion session.

  Materials: maps and handouts with information (background information) regarding the project.

  Outcome: to obtain general knowledge and attitude towards the project as well as any perceived risks or hazards.

- **Story telling**

  Facilitation method: discussion over current water situation - risks and impacts (positive and negative): gender, vulnerability etc.

  Meeting materials: flipchart and pens

  Outcome: To obtain information regarding the current water situation in the area: water availability, water quality, health risks, impacts etc.

- **Discussion session – perceived project impacts (construction & operational phase)**

  Facilitation method: discussion session

  Materials: flip chart, category cards, prestik and pens

  Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

- **Information gathering – environmental and social survey**

  Facilitation method: information gathering

  Meeting materials: survey, pens and clipboards

  Outcome: obtain current water situation as well as personal views, risks and issues regarding the proposed project.

- **Way forward**

  Closing date: 20 June provide any comments and information.

4.3 Documenting the process and results of consultation

Documenting consultation activities and their outcomes is critical to effectively managing the stakeholder engagement process. This should include details such as when and where meetings took place, with whom, what topics and themes were discussed and what the outcomes were.

This can be a useful tool in demonstrating that the views of affected people and influential stakeholders have been incorporated into the project's environmental and social mitigation strategies. Such documentation also provides the basis for reporting back to stakeholders on how their views have been addressed. The results of the focus group meetings held will form part of the environmental and social risk/ impact assessment and environmental and social management plans.

5 Closing comments

Communities sometimes express frustration that companies appear unexpectedly to consult on an issue and they do not report back to the community on issues raised in a timeous way.

It is both good practice and common courtesy to follow up with stakeholders, to let them know what has happened and what the next steps in the process will be. Apart from this, there are also practical benefits of follow-up, such as double checking information, and testing or refining proposed approaches and mitigation measures before implementing them. In addition, the process of reporting back to stakeholders on which of their concerns will be addressed and how, as well as explaining what suggestions were not taken on board and the reasons why, can help establish credibility, manage expectations, and reduce consultation fatigue or cynicism.

All of these are important when taking a long-term view of stakeholder engagement. This feedback to report back on initial interactions with affected communities / stakeholders will be facilitated through the next phases of the proposed project.

Appendix A

Task Status Table

Table 1: Task Status Table

Task	Status	Date	Responsible Person	To be reviewed by client	Date sent
Organise focus group meetings					
Confirm venues					
Organise translators					
Stakeholder Consultation and Disclosure Plan (PCDP)					
Meeting handouts					
Meeting agenda					
Attendance registers					
Printing of meeting material					
Itinerary					

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Bringing ideas to life

Aurecon offices are located in:
Angola, Australia, Botswana, China, Ghana, Hong Kong, Indonesia, Kenya, Lesotho, Macau, Mozambique, Namibia, New Zealand, Nigeria, Philippines, Qatar, Singapore, South Africa, Swaziland, Tanzania, Thailand, Uganda, United Arab Emirates, Vietnam.

Annexure 4: Social stakeholder engagement report: Bethanie

Social Stakeholder Engagement Report

Bethanie

NamWater

Reference: 113771

Revision: v3

29 June 2017

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Bringing ideas to life

Contents

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Abbreviations

ACHM	Ad Hoc Complaint Handling Mechanism
BID	Background Information Documents
CBO	Community Based Organisation
CDC	Community Development Committee
CEO	Chief Executive Officer
CMHC	Counselling and Mental Health Centre
DRFN	Desert Research Foundation of Namibia
EE	Executing Entity
ESIA	Environmental, social, and gender assessment
ESMP	Environmental and social management plans
ESMS	Environmental and Social Management System
HIV/ AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HR	Human resources
IFC	International Finance Corporation
IPPR	Institute for Public Policy Research
NamWater	Namibia Water Corporation Ltd
NCPE	National Commission for the Promotion of Equality
NIE	National Implementing Entity
NGO	Non-governmental organisation
PFG	Project Formulation Grant
STI's	Sexually transmitted diseases
TB	Tuberculosis
UNDP	United Nations Development Programme

1 Introduction

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes. A successful demonstration of the methods will enable further roll-out to other sites in the country.

The Namibia Water Corporation Ltd as an Executing Entity (EE) in collaboration with the Desert Research Foundation of Namibia (DRFN) as an National Implementing Entity (NIE), applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology. In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through screening process
2) Environmental, social, and gender assessment (ESIA) – only risk identification at this stage
3) Environmental and social management plans (ESMP)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – data gathering
5) Stakeholder disclosure and consultation (stakeholder engagement)
6) Grievance mechanism developed

This documents refers to the stakeholder engagement process related to the six (6) steps as outlined in the Environmental and Social Management System (ESMS) manual. The outcomes of the stakeholder engagement from this study will be used to inform the reports generated for the above-mentioned steps.

The baseline social conditions of a community are the existing conditions and past trends associated with the human environment and their area of influence in which the proposed activity is to take place. Assessing proposed developments in a socio-economic context will help both the developer and affected community to identify potential social equity issues, evaluate the adequacy of social services and determine whether the project may adversely affect overall social well-being. Focus group discussions assist in identifying these social conditions and the socio-economic context of the proposed project.

A focus group discussion is a guided discussion involving a small number of people (between 5 and 20) sharing a common characteristic (e.g. belonging to the same socio-professional group, etc.). These discussions will address socio-economic topics relating to socio-economic impacts based on projects and initiatives of common interest to stakeholders, and issues raised during discussion will be recorded

and subject to qualitative analysis. Data from these discussions will assist in updating socio-demographic information, as well as allowing a forum for community initiatives to be discussed with relation to socio-economic impacts.

Figure 1: Focus group meeting at Bethanie Local Council Offices

Through the focus groups relatively dependable data can be gathered within a short time frame. Effective consultation and engagement is a vehicle that will be used to build more resilient relationships with affected stakeholders and communities. It will lead to the identification of perceived social impacts that the proposed project may have on these communities as well as possible mitigation measures, which will inform the overall study.

2 Methodology

1.1 Planning and preparation

1.1.1 Stakeholder identification

The first step is to identify stakeholders i.e. determining who the project stakeholders are as well as their key groupings and sub-groupings. Careful identification of local peoples' representatives is an essential part of preparation for the consultation process. When selecting representatives, it may be useful to consider the following:

- Who are the elected officials of the territorial jurisdictions impacted by the project or measure? To what extent do these authorities adequately represent local peoples?
- Who are the traditional leaders of the local peoples?
- Given that local communities are not necessarily homogenous, are there groups, such as women, youth, and agricultural, who are not represented by either of the above?
- Are parallel communications needed for these groups?

The following council representatives have been identified and will participate in the focus group sessions: Bethanie Village Council, Grunau Village Council and Epukiro Post 3 Village Council.

1.1.2 Choosing dates and venues

It will be important to choose a venue where stakeholders feel more comfortable - most likely at a location within the community as this tend to have more productive engagement processes, for the following reasons:

- It lends **transparency** to the process. Community members can witness the process and stay informed about what is being discussed on their behalf, and what has been agreed at the close of consultation or negotiations.
- It increases **accountability** of local leaders. Community members will know what they are entitled to demand, and they will be able to monitor its delivery and avoid corruption.
- It sends the **message that the input of communities** are valued enough to travel there and spend time with them
- It contributes to community members' feeling of **ownership over the engagement process**. Community members say that the opportunity to have input into stakeholder meetings gives them a sense of having a role in the outcome of decisions.
- Finally, it allows community members to **identify their own representatives**, preventing illegitimate representatives from claiming that they speak for communities.

1.1.3 Stakeholder notification

Stakeholders identified and included in the stakeholder database were notified of the relevant meetings either by formal letters, email, posters and phone. Posters were placed at various conspicuous locations all over the local Village. A radio announcement was also sent over the local Radio regarding the meetings. Find email correspondence in Appendix A and poster in Appendix B.

Figure 2: Poster at Bethanie School Hall

The meetings were held as follow:

Tuesday, 13 June 2017 at;

- Bethanie Town Council Hall @ 15H00 – Authorities such as Councillors, Headmen, Traditional Leaders

Wednesday, 14 June 2017 at;

- Bethanie School Hall @ 09H00 – Local businesses, entrepreneurs, local community such as, families, men, woman, children, schools, hospitals, churches and any others.

1.1.4 Focus group materials

It is not only important to choose a venue where stakeholders feel comfortable at but also to use appropriate level and type of meeting materials that the participants will understand and feel comfortable with and that will allow for maximum participation.

When deciding on which materials to use during focus group meetings the following must be taken into account: audience, venue, equipment available, timeframe and desired outcomes.

To ensure the focus group sessions had maximum participation and provide best results, the following meeting materials were used: digital presentation (Appendix C) providing project information and mapping the site and surrounding areas as well as Background Information Documents (BID). See BID in Appendix D

1.2 Outline of focus group meetings

The focus group sessions were structured sessions facilitated by a social scientist. Aurecon prepared the attendance register, background information as well as facilitate the focus group meetings and record the meetings and issue meeting records.

The following draft agenda for meeting with Councillors etc. were used for the focus group meetings.

Topic	**Speaker**
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater
Perception activity Current water situation and attitude towards project	Aurecon
Discussion session Perceived positive and negative project impacts (construction and operational phase)	Aurecon
Information gathering Vulnerable and disadvantaged groups: Community structures and protocols	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/ Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials were utilised as well as the envisaged outcome.

- **Project introduction**

  Facilitation method: project overview and discussion session.

  Materials: maps and handouts with information (background information) regarding the project.

  Outcome: to inform stakeholders about the project.

- **Perception activity**

  Facilitation method: initiating discussion over project perception

  Meeting materials: cards

  Outcome: to obtain general knowledge and attitude towards the project

- **Discussion session – current issues as well as perceived project impacts (construction & operational phase)**

Facilitation method: discussion session

Materials: flip chart and pens

Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

- **Discussion session – vulnerable and disadvantaged groups**

  Facilitation method: discussion session

  Materials: flipchart and pens

  Outcome: to identify / name vulnerable and disadvantaged groups. To identify perceived impacts of project on groups as well as recommendations on how to include these groups as well as how these groups can benefit from project. For this project, it will be very useful to compile socio-economic information and to collect socio-economic data in advance to ensure that the stakeholder engagement activities are culturally appropriate from the outset, and that the groups most vulnerable or potentially disadvantaged by the proposed project are identified early on.

- **Community structures and protocol**

  Facilitation method: information gathering

  Meeting materials: flipchart and pens

  Outcome: obtain names and contact details of current organisations and structures in communities (will assist with the next phases of the project). Identify protocol for dissemination of information as well as protocol to deal with grievances (current structure in communities as well as recommended for project.

- **Way forward**

  Closing date: 20 June to provide any comments and information.

  Meeting materials: BIDs to distribute.

The following draft agenda for meeting with other stakeholders. were used for the focus group meetings.

Topic	**Speaker**
Opening and welcome	Local representative
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Story telling Current water situation: risks and impacts (positive and negative): gender, vulnerability etc.	Aurecon
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Information gathering Environmental and social survey	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/ Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials were utilised as well as the envisaged outcome.

- **Project introduction**

  Facilitation method: project overview and discussion session.

  Materials: maps and handouts with information (background information) regarding the project.

  Outcome: to obtain general knowledge and attitude towards the project as well as any perceived risks or hazards.

- **Story telling**

  Facilitation method: discussion over current water situation - risks and impacts (positive and negative): gender, vulnerability etc.

  Meeting materials: flipchart and pens

  Outcome: To obtain information regarding the current water situation in the area: water availability, water quality, health risks, impacts etc.

- **Discussion session – perceived project impacts (construction & operational phase)**

  Facilitation method: discussion session

  Materials: flip chart, category cards, prestik and pens

  Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

- **Information gathering – environmental and social survey**

  Facilitation method: information gathering

  Meeting materials: survey, pens and clipboards

  Outcome: obtain current water situation as well as personal views, risks and issues regarding the proposed project.

- **Way forward**

  Closing date: 20 June provide any comments and information.

3 Setting the scene

Bethanie is in the far south of the country, in the //Karas Region and in the Berseba Constituency, as seen in Figure 3 below. Bethanie lies on the C14 Pad, which turns off the B4, approximately 110 kilometres west of Keetmanshoop and then leads to the North.

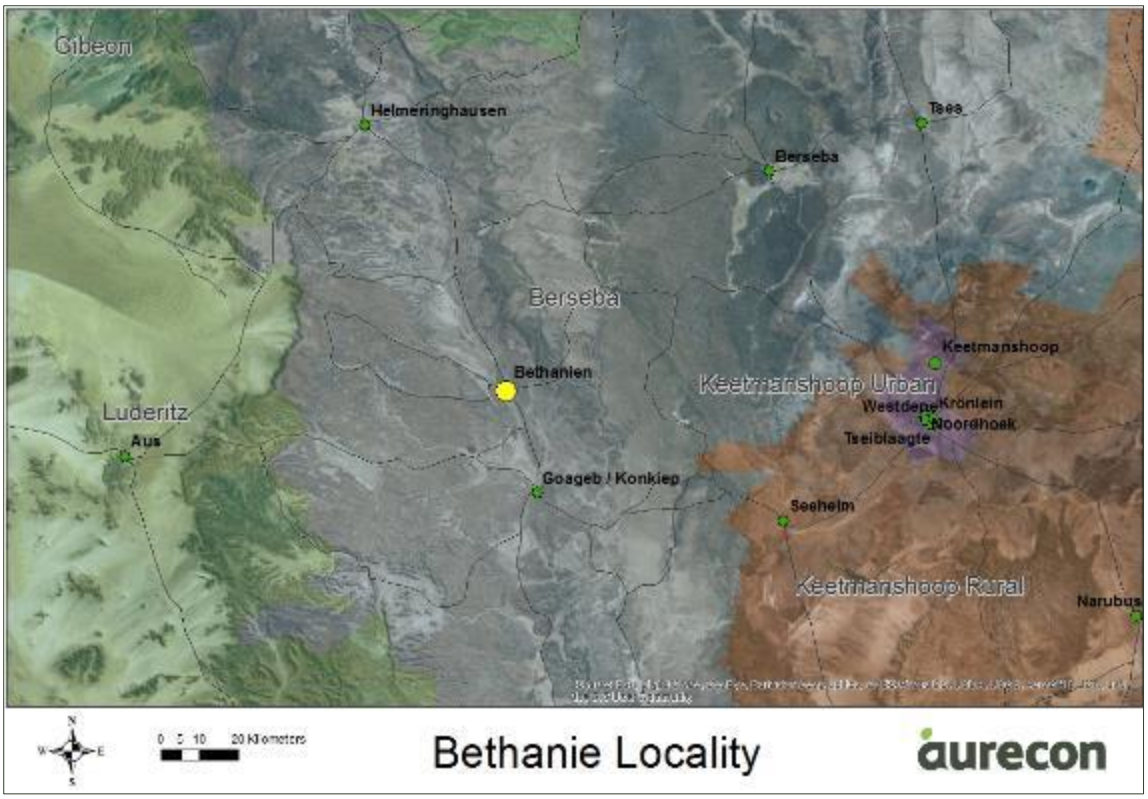

Figure 3: Bethanie Locality

The village has a strong spring and therefore as early as 1804 Orlam Nama people settled in this area. In 1814, the missionary Johann Hinrich Schmelen was sent to Bethanien by the London Mission Society to christianize the Nama. Schmelen built the first stonehouse in Namibia, now known as the "Schmelen House". It is surrounded by several beautiful palm trees and is a National Monument today. It houses the mission history museum of Bethanien. little village of Bethanien - with around 3000 residents - is now the logistic centre for the surrounding farms and Nama settlements. It boasts a couple of impressive churches, all in immediate vicinity to the Schmelen House.[1]

3.1 Social baseline

The aim of this section is to contextualise the study by developing a socio-demographic profile that captures the relevant characteristics of the affected region. It will also assist in setting the schene in regards with gender and vulnerable groups' risks.

3.1.1 Key socio-economic statistics

Table 1: Key socio-economic statistics

Below is a summary of the population statistics for the ǁKaras Region in which Bethanie is situated..

	2011	2001
Population Size		
Total	77 421	69 329
Females	38 014	32 346

[1] http://www.namibia-travel.net/travelguide/southern-namibia/bethanien.html

Males	39 407	36 976
Annual growth rate (%)	1.1	1.1
Percent in Urban/Rural areas		
Urban	54	54
Rural	46	46
Sex ratio: Males per 100 females	104	114
Population density		
People per sq. km.	0.5	0.4
Age composition, %		
Under 5 years	11	11
5 – 14 years	19	20
15 – 59 years	63	63
60+ years	6	6
Marital status: 15+ years, %		
Never married	59	69
Married with certificate	27	20
Married traditionally	3	2
Married consensually	7	5
Divorced / Separated	1	1
Widowed	3	2
Citizenship, %		
Namibian	97	96
Non---Namibian	1	3
Main language spoken at home, Percent of households		
Afrikaans	36	40
Oshiwambo	27	23
Nama/Damara	23	26
Head of households		
Females	44	49
Males	56	51
Literacy rate, 15+ years, %	97	87
Education, 15+ years, %		
Never attended school	6	7
Currently at school	9	7
Left school	84	77
Labour force, 15+ years, %		
In labour force	75	67
Employed	68	71
Unemployed	32	29
Outside labour force	19	24
Student	39	28
Homemaker	15	40
Retired, too old, etc.	35	32
Housing conditions, %.		
Households with		
Safe water	92	94
No toilet facility	23	26
Electricity for lighting	67	50
Wood / charcoal for cooking	28	35
Main source of income, %		
Household main income		

Farming	5	7
Wages & salaries	72	69
Cash remittance	5	6
Business, non-farming	5	5
Pension	11	10
Fertility		
Average number of children per woman	3.1	3.1
Disability		
With disability	4	3

Source: Namibia 2011 Population and Housing Census Main Report

3.2 Current water situation

Water is life. For millions for years' life on earth has been dependant on water for survival. The amount of water on earth is constant and cannot be increased or decreased, but it is unevenly distributed across the earth.[2] According to the IPPR, Namibia is facing a creeping yet increasingly precarious situation of freshwater scarcity, and the UNDP states that Namibia is the driest country in sub- Saharan Africa receives a pitiful 270 millimetres of downpour per year on average. Of this 83 percent evaporates as soon as it hits the ground. Climatologists predict temperatures in the country will rise with 1 to 6 degree in the next several decades, while rainfall could drop another 200 millimetres. Already, in the past few years, rains have been erratic leading to alternating heavy floods and dry spells. The consequences are devastating for a country where 70 percent of the people to some extent depend on agriculture.

Figure 4: Water tank at Bethanie

Currently Bethanie obtains its water from two boreholes in the Konkiep River, approximately 2 km away from the town. The Local Council indicated that 40% of the water is supplied by the borehole belonging

[2] http://www.waterwise.co.za/site/water/environment/situation.html

to NamWater the other 60% is supplied by the Local Council. The NamWater water supply scheme is managed by NamWater and the Bethanie Village Council is responsible for the management of the water reticulation.

Past and current operation of the boreholes makes no major impact on the aquifer, and there is sufficient capacity to meet the present and future demand. The scheme currently runs at a maximum of 53% of its recommended abstraction rate, and even in a high-growth scenario this is expected to be about 60% in 2030. The borehole pumps are activated and de-activated automatically via ball valves in the reservoir, and the scheme has an operator that checks daily that the systems are functional.

Water is reticulated to the town where it is metered at its discharge points to the end consumers. The Council indicated that 90% of households have taps in their yard where the remaining 10% have access to water through communal stand pipes. There is waterborne sewage in the town, while a bucket system is used in the toilets in the informal settlement. The condition of the existing infrastructure is rated as sufficient until at least 2030.

The main problem with the water supply situation is the quality. The water situation at Bethanie is sub-standard because of the high level of fluoride in the groundwater. The fluoride level is high (in the order of 3.3 mg/l), which does not comply with the Namibia Water Quality Standards for human consumption which requires fluoride to be < 1.5 mg/l. Turbidity also sometimes exceeds the water quality standards and chlorination is occasionally inadequate, leading to the presence of bacteriological contamination by coliforms. Options to rectify these problems have been found to be financially non-viable, and a solution still needs to be found.

Extensions that have been recommended to cater for future demand and water quality improvement include a treatment unit (filtration through activated alumina), and installation of a telemetry and monitoring system to reduce operational losses. Alternatively, at greater cost, a desalination plant could be established to improve the water quality. The elevated tower reservoir has a capacity for only 8 hours supply in the event of power outages, and additional storage capacity should be considered for emergencies. It has been suggested that water only for human consumption needs to be treated. This would reduce the cost of the treatment facilities. Small plants could be provided at strategic positions to supply drinking water for collection by residents.

3.3 Gender and community aspects

In rural areas, such as Bethanie, women equally share involvement in the workforce. This is further promoted by the Namibian National Gender Policy 2010 – 2020. To address gender issues and empower women, during the lifespan of the project the project team must mutually share the decision-making with various levels of government, community groups, key stakeholders and members of the public, especially women. The discussion with the community at different stages would attempt to bring to the fore the role of women, specific challenges faced by them, requirement to develop their adaptive capacities, focus on women headed household and their challenges. The project aims to build on the

inherent social characteristics of the region and address any gender equity issues during project implementation, if any.[3] The community would feel empowered and take ownership of the project's advantages and its risks. Empowerment is selected when the community and stakeholders are provided with the skills, information, authority and resources in order to make the final decision. Individuals and stakeholders must have capacity to understand risk and accept responsibility and implement initiatives.

4 Meeting outcomes

4.1 Stakeholder profile

Figure 5: Stakeholder engagement meeting delegates

The profile of the delegates who attended the stakeholder engagement meetings is as follows (See also attendance registers and stakeholder database in Appendix E.):

Age: of the 43 delegates that attended the meeting 27 were female and 16 were male.

Age range: the majority of the delegates were between the age of 50 and 59 (30%) and 40 and 49 years (26%). See below Figure 6 below for age profile breakdown.

[3] Building Adaptive Capacities of Communities, Livelihoods and Ecological Security in the Kanha-Pench Corridor of Madhya Pradesh. India.

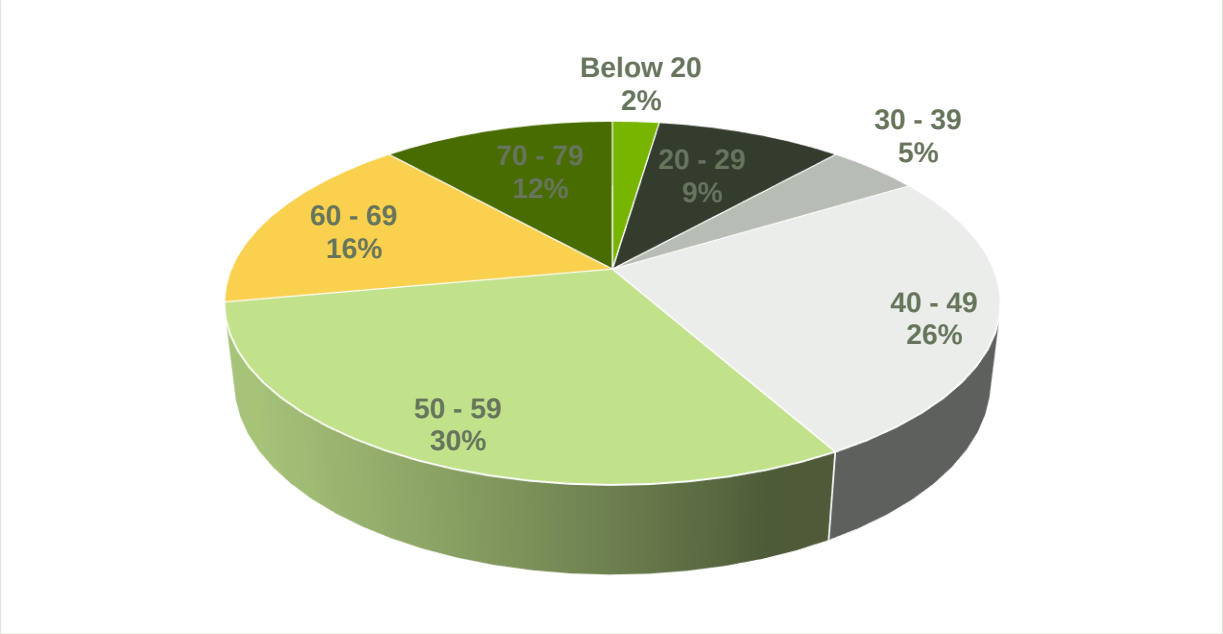

Figure 6: Delegates age profile

Table 2 below is a breakdown of the classification of the stakeholder engagement delegates.

Table 2: Delegates classification

Position / interest / classification
Acting CEO
Assistant Accountant
Business Woman
Community Member
Councillor
Farmer
House Wife
HR Officer
Office of the Judiciary - Chief Legal Clerk
Pensioner
Traditional Councillor
Unemployed

4.2 Impacts of current water situation on local community

The current population in Bethanie is estimated at 2,978 persons. The substandard quality water has certain negative impacts on the local community. Some of the impacts mentioned by the Bethanie community includes:

- Health impacts;
    - Bad taste,

    - Brown teeth,
    - Gastrointestinal disturbance, and
    - Headaches.
- Economic impacts;
    - Medical and dental expenses, and
    - Expensive water and food.
- Impacts on development and investment opportunities.

4.2.1 Health impacts

The community of Bethanie indicated that the water supplied to the people tastes bad and this has an impact on the amount of water people drank, which in turn has an impact on the general health of the community. One of the biggest impacts that the water has on the local people is that the fluoride in the water causes teeth to brown. It has a financial impact, as dental services are costly and the dentist is located in Keetmanshoop, approximately 110km from Bethanie. It not only has an economic impact but also a far-reaching impact on the self-esteem of people especially on the youth and women of the community. According to the Counselling and Mental Health Centre (CMHC), low self-esteem can create anxiety, stress, loneliness, and increased likelihood of depression, and can have consequences such as:

- cause problems with friendships and romantic relationships;
- seriously impair academic and job performance; and
- can lead to increased vulnerability to drug and alcohol abuse

Worst of all, these negative consequences themselves reinforce the negative self-image and can take a person into a downward spiral of lower and lower self-esteem and increasingly unproductive or even actively self-destructive behaviour.

Other health impacts that the current water quality have on the local community and more so on visitors to Bethanie is gastrointestinal disturbances. The local community has built up a little bit of a resistance to the water quality, but prolonged exposure to the high fluoride content in the water does impact on the gastrointestinal health of the community. Visitors to the area are discouraged to drink water from the taps in order to prevent gastrointestinal disturbances. Headaches are also caused by the lack of water consumption and the consumption of water with a high fluoride content.

4.2.2 Economic impacts

Because of the health impacts associated with the substandard water quality, more money is spent on health services such as dental and medical services. The local community indicated that a lot of the people living in Bethanie are unemployed and do not have the necessary funds for such services as it is not only the appointment and medicinal fees but also transport fees that is part of such a health visit.

The meeting attendees indicated that the amount paid (N$ 12.41/m³) for the substandard water is high for the community. This they feel puts more pressure on the already strained financial situation of the local community. Another economic impact stated is that the water is also not suitable for growing crops, especially vegetables, and the people of Bethanie must import their vegetables and fruit from other regions at a higher price.

Another financial burden placed on the community as a result of the high fluoride content in the water is the impact the water has on household appliances. The people indicated that their kettles and irons and other appliances that use water does not last very long and must be replaced regularly. This is very costly and increases the financial stress on households.

4.2.3 Impacts on development and investment opportunities

The substandard quality water is deterring development and investment to come to Bethanie and therefore hampering economic development and progress. The community feels that once investors realize that the water quality in Bethanie is bad they move to another area where the water quality is better.

4.3 Questions and other comments from community

This section lists the questions and comments received from the community during the stakeholder engagement sessions.

Questions:

- Will the price of water go up?
- Will the project also treat the water from the Council's borehole?
- What will happen with the brine?
- Can the brine be used for agriculture?
- Will the project provide employment for the local community?
- Will the project provide skills transfer, upliftment and training opportunities to the community?

Comments:

- The project must put in place measures to make sure the plant is secured and protected against vandalism, inner electrified fences suggested.
- The community is in favour of this project and welcome any project that will improve their lives.
- They hope that the project will open the door to other projects and investment opportunities in the town. For example; the upgrade of the road North of Bethanie to bitumen standard; providing of recreational facilities; tourism services and agricultural opportunities.

4.4 Survey results

The stakeholder engagement delegates completed a short survey in order to assist with the project proponent in assessing the current water situation in Bethanie, see Appendix F. However, it should be noted that the survey results illustrated below is not necessarily a true representation of the whole community of Bethanie, especially in the fields of gender, age and employment status.

31 delegates completed the short water survey, the below section illustrates the results.

Gender

Table 3: Gender breakdown

Gender	Number
Female	18
Male	12

Disability status

Only one delegate indicated that he is disabled.

Age

Table 4: Age breakdown'

Age range	Number
Below 20	1
20 – 29	2
30 – 39	1
40 – 49	8
50 - 59	8
60 - 69	6
70 - 79	4

Employment status

Table 5: Employment status

Employment status	Number
Unemployed	23
Employed	7

Water source

Table 6: Water source

Water source	Number
Local Authority	21
NamWater	30

Distance from water source

Table 7: Distance from water source

Distance from water source	Number
Tap in yard	25
+- 100m	3
+- 5km	3

Water expense

Al the delegates indicated that they pay for their water and all delegates except three indicated that they feel that water is expensive.

Table 8: Water expense per month

Water expense per month	Number
N$ 50 - 99	2
N$ 100 - 199	2
N$ 200 - 299	14
N$ 300 - 399	8
N$ 400 – 499	1
N$ 1000 - 1400	3

Water quality

Table 9: Water quality

Classification	Number
Very poor	13
Poor	10
Acceptable	6
Very good	1

What impact / influence does the quality and availability of water have on your life? E.g. Health and safety impacts, financial, gender vulnerability, etc.

The comments received from the delegates include the following:

- The water is very expensive;
- It causes a financial burden;
- The quality of the water is very poor;
- It has a negative impact on our health especially for kidneys, skin, eyes, legs and hair;
- The people in Bethanie's teeth becomes brown and brittle because of the water. It also has a financial implication as we must visit the dentist more regularly;
- The water is full of lime and is salty;
- People get Gastrointestinal disturbance and headaches;
- The water tastes bad;
- Low self-esteem because of the brown and brittle teeth and other health issues caused by the poor-quality water, this has an impact on the employment rate and demoralise the community;
- Cannot have a garden or participate in any agricultural practices;
- Struggle to get laundry clean;
- We need to travel long distances to get water;
- It has a negative financial impact. Because of the poor water we must replace our appliances and water pipes regularly;

4.5 Grievance procedure

4.5.1 Local community

The grievance procedure currently utilised by the Bethanie community is that the grievances go through the Local Village Council and the Community Development Committee (CDC). The CDC is made up of representatives from:

- The Local Council;
- Churches;
    - Churches include: C F Memorial Ame Church, Evangelical Lutheran Church, Rhenish Mission Society Church and the Dutch Reformed Church.
- Schools;
    - Schools include: DC Frederick Primary School, Schmelenville Junior Secondary School and St. Joseph's Primary School.
- Health structers:
    - Health structures including: Bethanie Health Centre.
- NamWater;
- NamPower;
- Elders;
- Women;

- Youth;
- Agriculture groups;
- Other groups; and
- Business owners.

The CDC is not as active as it could be and it is recommended that this committee be revived and revised to be able to be the contact point between the project and the local community, and handle all grievances. The community indicated that this is the way they would prefer grievances to be handled. They also stipulated that dates must be set for CDC meetings so that continuous communication between the project and the community can be a reality.

4.5.2 Grievance redress process

Although a company generally differentiates between the actions of its own employees and those of contractors and subcontractors, local communities tend to see no difference and will attribute actions of contractors and subcontractors to the company. This is the case even if contractors are in the country only for a short period of time.

Companies need to anticipate grievances that may arise from the actions of suppliers or contractors, and implement a policy and management tools, such as regular monitoring to govern their behavior and actions, including provisions for coordinated management of grievances and key indicators that help evaluate the effectiveness of contractors' policies and tools. Where there are a small number of contractors, it may be feasible for the contractors to establish and manage their own grievance mechanisms. Companies will need to make sure that these mechanisms do not conflict with the company mechanism or those of the other contractors by establishing clear guidelines and ensuring oversight. Where contractual relationships are more complex or numerous, companies may wish to have all grievances directed to the company's mechanism, regardless of whether they relate to the company or its contractors or subcontractors.

Handling grievances encompasses a step-by-step process as well as assigned responsibilities for their proper completion. Figure 7 below provides **procedure on how grievance** should be received, registered and tracked. Contractors establishing grievance mechanisms will follow the process steps discussed in this section.

Please also see Grievance Mechanism Report for further detail in Appendix G.

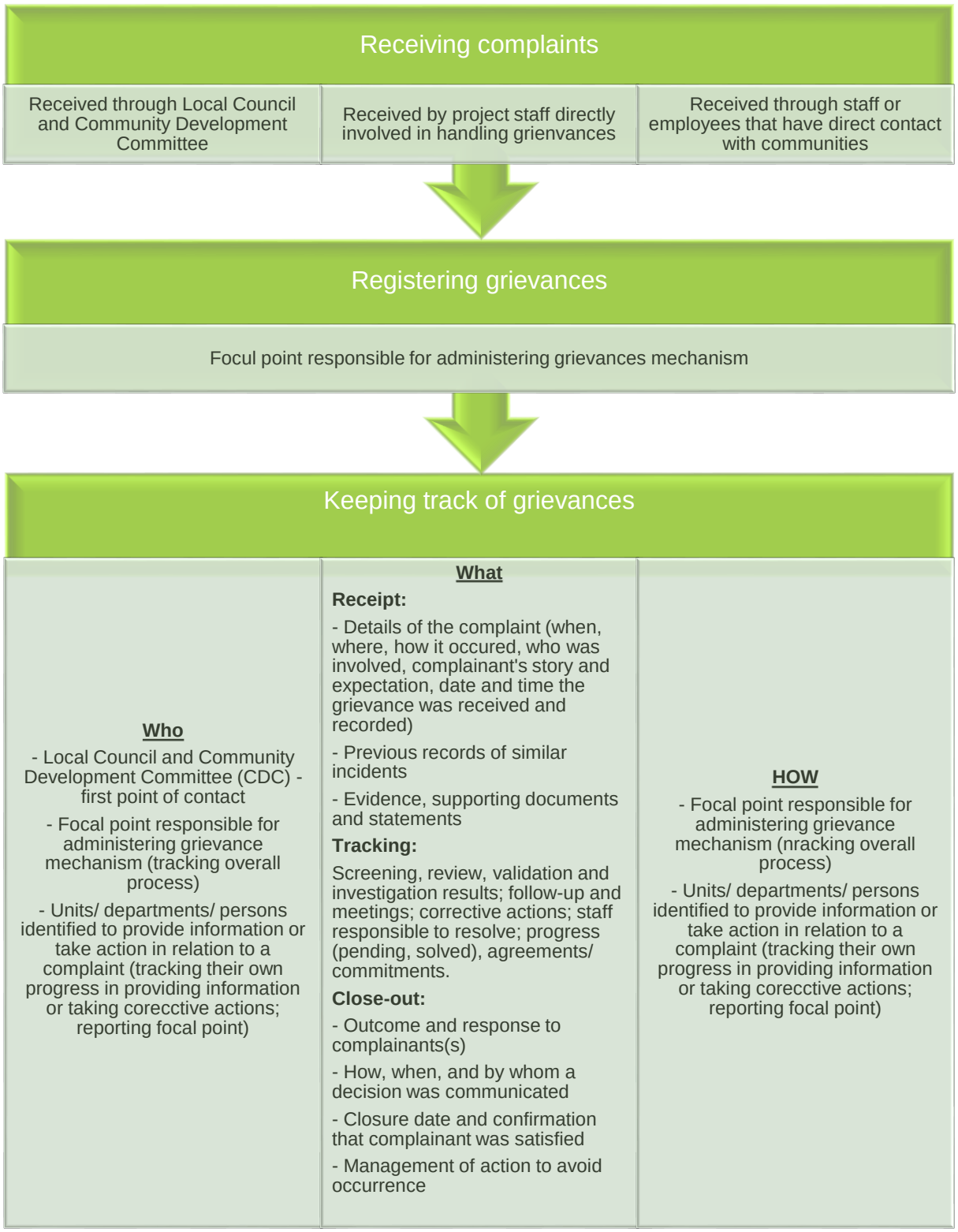

Figure 7: Grievance redress process

4.5.3 National implementing entity (NIE) - DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release

of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities. Please see the Ad Hoc Complaint Handling Mechanism (ACHM) as approved in October 2016 in Appendix G.

4.5.4 Executing entity (EE) - NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)
- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments.
- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation. Please see the NamWater Grievance Handling in Appendix H.

5 Social risks to project

Social risks arise from the dissatisfaction and grievances of external community and non-governmental stakeholders. Failure to manage these issues can have enormous economic costs, significantly damage the reputations of organisations involved and even put entire investments at risk. Some of the common social risks that can impact on project outcomes are summarised in the list below:

- Risk of sudden population growth and an increased demand for water because of new development such as for e.g. new mine, industry, road route etc.
- Poor community participation.
- Safety and security risks.
- Risk of plant failures, down times and project delays or abandonment.
- Risk of change in law.
- Risk of women being excluded from decision making and project sustainability due to culture or project management structure.
- Reputational damage.
- Lack of user acceptance.
- Decreased operational revenues.
- Consumer boycotts.
- Major modifications due to stakeholder pressure.
- Exposure to legal action.

It is critical however that project stakeholders are not just seen as a source of negative risk to projects. Establishing good relationships with stakeholders and focusing on their concerns can generate significant positive opportunities for the project and proponent.[4]

6 Potential positive and negative project impacts

Potential negative socio-economic impacts include the following:

- A **temporary loss of land and assets** to the road servitude or areas to be occupied by project-related surface infrastructure;
- A **population influx** (due to the presence of a construction workforce, as well as an influx of job-seekers into the area), with a possible concomitant increase in social pathologies and increased pressure on existing infrastructure and services;

[4] http://www.engineersagainstpoverty.org/documentdownload.axd?documentresourceid=21

- **Disruption of access routes and daily movement patterns** by the construction. Blocking of traditional travel paths (people/animals).
- **Displacement.** Permanent loss of life-long social and emotional investment as well as livelihood resources for the households that need to be relocated.
- **Impacts on sense of place**. Such impacts may arise as a result of the visual intrusion of project-related infrastructure, as well as noise and traffic impacts during construction
- **Dust** caused by the construction works and from movement of heavy equipment. During the construction phase, the local community and construction workers would be inconvenienced by the dust generated by the construction works.
- **Noise and vibration** due to the construction works and from movement of heavy equipment. Movement of heavy machinery on existing local roads may be one of the core problems for the local community during the construction phase.
- **Socio-cultural differences and conflicts** between migrant workers and the local community. Single men predominately occupy the construction camps which could create social conflicts, usually as a result of cultural differences, alcohol abuse or being away from their wives or partners for extended periods of time. A possible reason for conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local community. An influx of unemployed job seekers could also add to the potential for conflict.
- Various **social pathologies**, such as drug/ alcohol misuse, abuse of woman and 2children and incidences of sexually transmitted diseases (STI's) may increase with the influx of job-seekers into the area. Crime is another social pathology that may increase. An inflow of construction workers and job seekers may also be accompanied by an increase in crime. Even if specific instances of crime are not as a result of the newcomers, they may still be ascribed to them by local communities.
- **Informal settlements**. Once construction is concluded and the camp is vacated, it may be illegally occupied.
- The need to **secure accommodation for construction** staff.
- **Gender impacts**. Structural gender inequalities embedded in our society - unequal access to and control over material and non-material resources, assets and opportunities.

Positive socio-economic impacts include the following:

- **Local employment and job opportunities**. The construction phase of the project will have a positive impact on the local labour market. A positive impact on continued permanent employment will be probable due to the proposed project as the long-term economic viability of the mine will be possible, following the mine expansion.
- **Local economy opportunities and economic empowerment**. The construction phase of the project will have temporary positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project.

- **Local economic growth**. The project will stimulate local economic growth with provision of better quality water.
- **Improved health**. The project will provide the local community with better quality water and this will have a positive impact on the health of the people.
- **Training and skills transfer**. The project will provide the opportunity for the local community to participate in training and skills transfer activities.

7 Proposed mitigation measures

The following preliminary mitigation and enhancement measure have been identified:

Population influx:

- The recruitment policy used to employ people on the project must be fair and transparent.
- The intention of giving preferential employment to locals is clearly communicated, to discourage an influx of job-seekers from other areas.
- Inform local businesses about the expected influx of construction workers so that they could plan for extra demand.
- Ensure that employment procedures/ policy of the contractor is communicated to local stakeholders, local farmers and Local Ward Councillor.
- Have clear rules and regulations for access to the construction site to control loitering.
- Consult with the local private security companies and Police to establish standard operating procedures for the control and removal of loiterers at the construction site.
- Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company.
- Construction workers must also be provided with identification tags.

Creation of informal settlements:

- Facilitate the establishment of a “Community Safety Committee” to monitor and control illegal squatting. Committee to consist of:
    - The community relations Department of NamWater;
    - The Local Council;
    - Local landowners;
    - Representatives of local community structures; and
    - Local police and the Community Policing Forum
- Align social investment strategies with municipal development.
- NamWater employees who receive living-out allowances should be required to provide proof that this allowance is used for formal accommodation.
- Include a requirement in the Conditions of Service of construction contractors that construction workers must be vacated from the area once construction is completed.

Local employment and job opportunities:

- Unskilled job opportunities should be afforded to the local communities, as far as possible.
- Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities.
- Individuals with the potential to develop their skills should be afforded training opportunities.
- Payment should comply with applicable labour legislation in terms of minimum wages.
- Where local labourers are employed on a permanent basis, these labourers should be registered with the official bodies as required by law. This would enable the workers to claim unemployment.

Local economy opportunities and economic empowerment:

- The developer to encourage, in consultation with key stakeholders, construction companies to use local services.
- Local procurement opportunities.
- Implement community contracting and training.
- Create a platform where development of micro, small and medium enterprises is developed.

Various social pathologies:

- Implement HIV/ AIDS, alcohol abuse, drug abuse, and domestic violence prevention and awareness campaigns in the communities.
- The contractors should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a minimum, include programmes to combat HIV/ AIDS and TB.
- The contractor should make HIV/ AIDS and STI awareness and prevention programmes a condition of contract for all suppliers and sub-contractors.

Crime:

- Regarding safety and security, construction workers should be clearly identifiable.
- Overalls should have the logo of the construction company on it and construction workers should wear identification cards.
- The construction site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard.
- Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations

Noise:

- Construction activities should be restricted to daytime hours between 07:00 to 18:00.

- Adjacent households should be consulted and notified of any construction activities that could lead to excessive noise levels in advance.
- The households should also be consulted if any night time construction activities are to take place.

Disruption of access:

- Unauthorised access to the construction site must be prevented through appropriate fencing and security.
- When the construction period has ended the implementation of adequate rehabilitation measures to return the landscape and other changes to at least its original state.

Displacement:

- Inform affected people of their options and rights concerning resettlement.
- Provide technically and economically feasible options for resettlement based on consultation with affected people and assessment of resettlement alternatives.
- Whether physical relocation is required or not, provide affected people with prompt and effective compensation at full replacement value for loss of assets due to project activities.
- Where physical relocation is necessary, provide assistance with relocation expenses (moving allowances, transportation, special assistance and health care for vulnerable groups).
- Where physical relocation is necessary, provide temporary housing, permanent housing sites, and resources (in cash or in kind) for the construction of permanent housing—inclusive of all fees, taxes, customary tributes, and utility hook-up charges—or, as required, agricultural sites for which a combination of productive potential, locational advantages, and other factors are at least equivalent to the advantages of the old site.
- Provide affected people with transitional financial support (such as short-term employment, subsistence support, or salary maintenance).
- Where necessary, provide affected people with development assistance in addition to compensation for lost assets described above such as land preparation, agricultural inputs, and credit facilities and for training and employment opportunities.

Informal settlements:

- Once construction is completed and the construction camp vacated, the camp must be demolished to avoid settling of informal residents. Alternatively, if the camp is to be made available for use by other contractors on other projects, it should be “mothballed” until the new occupants take up residence.

Secure accommodation for construction

- One option would be to house them in a construction village. The other option will be to house them in nearby settlements. This may require that the Local Council or NamWater invest in the construction of additional housing units.

- It is recommended that one construction village be used to house construction workers of the project components to minimise the extent of pressure the additional housing will exert on social and council infrastructure.
- Maximisation of the proportion of job opportunities allocated to locals, thus reducing the need for outsiders
- Provision of sufficient entertainment facilities (e.g. lounge with TV, pool table, etc.)
- Demolishing construction village after construction activities have finished, or donating the construction camp to the local municipality for formal housing, or alternatively convert the construction camp to permanent housing for labourers during the operational phase.

Gender impacts:

- Detailed and specialised gender awareness must be provided. This can be set up in different forms, such as training courses, activities and promotion to enable individuals to implement gender mainstreaming in their everyday work.
- Participation of both genders in decision-making. An equal participation of both genders is important not only in decision-making but also for gender mainstreaming, in general.
- The division of labour by gender. The structures which organise the division of labour must ensure that no discrimination occur because of gender.
- Training and skills transfer. No discrimination must occur because of gender.
- Receive comparable social and economic benefits.

8 Conclusion

The study has identified the following potential negative impacts associated with the construction phase of the proposed project, they include amongst others:

- Influx of construction workers employed on the project and who are housed in the construction village used for other constructions in the area;
- Influx of job seekers looking for work but who are unsuccessful;
- Increased risk to personal safety of farmers;
- Potential noise and dust impacts during the construction phase;
- Access problems during construction phase;
- Gender impacts.

Of the negative impacts, the influx of construction workers housed on the construction village and influx of job seekers from neighbouring communities were identified as the key social concerns.

While the presence of construction workers and job seekers do not in themselves constitute a social impact, the way the construction workers and job seekers conduct themselves can affect the local community.

The main area of concern identified during the study was the potential impact on existing family structures and social networks. The potential impact on family structures and social networks are linked to the potential behaviour of male construction workers and the implications that this may have in terms of:

- A potential increase in alcohol and drug use;
- A potential increase in crime levels;
- A potential increase in teenage and or unwanted pregnancies;
- Potential increase in prostitution and increase in transmission of STI's and specifically HIV/AIDS;
- Loss of partners and/ or wives to construction workers with associated (and potentially violent) conflict.

These aspects, specifically the links between alcohol, drugs, prostitution and crime, are all interrelated.

Furthermore, it can also be concluded that many of the significant socio-economic impacts of the proposed development will occur during the construction phase. Positive impacts during this phase will include temporary creation of employment opportunities, as well as concomitant economic benefits and possible creation of opportunities for establishment of small businesses.

Finally, socio-economic environment in general poses no significant adverse socio-economic impacts for the construction of the proposed project. However, this is dependent on the mitigation measures identified in this document being implemented and adhered to. This is particularly relevant where construction activities could affect the quality of life of adjacent households in terms of access, noise, dust, safety and security

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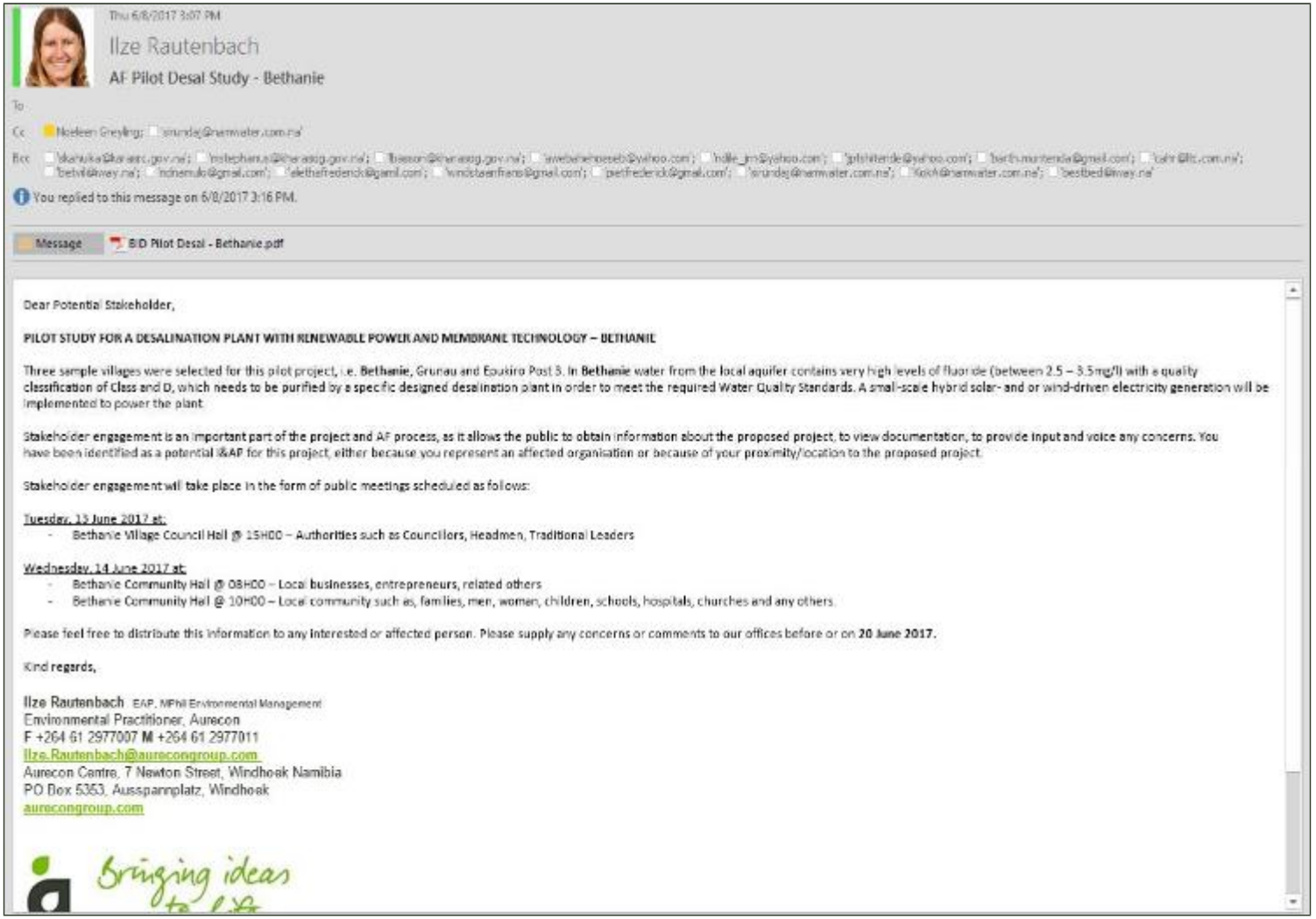
Appendix A – Emails



Thu 6/8/2017 3:07 PM

Ilze Rautenbach

AF Pilot Desal Study - Bethanie

To

Cc Nedeen Greyling;

Bcc

You replied to this message on 6/8/2017 3:16 PM.

Message BID Pilot Desal - Bethanie.pdf

Dear Potential Stakeholder,

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY – BETHANIE

Three sample villages were selected for this pilot project, i.e. **Bethanie**, Grunau and Eoukiro Post 3. In **Bethanie** water from the local aquifer contains very high levels of fluoride (between 2.5 – 3.5mg/l) with a quality classification of Class and D, which needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards. A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

Stakeholder engagement is an important part of the project and AF process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns. You have been identified as a potential I&AP for this project, either because you represent an affected organisation or because of your proximity/location to the proposed project.

Stakeholder engagement will take place in the form of public meetings scheduled as follows:

Tuesday, 13 June 2017 at:
- Bethanie Village Council Hall @ 15H00 – Authorities such as Councillors, Headmen, Traditional Leaders

Wednesday, 14 June 2017 at:
- Bethanie Community Hall @ 08H00 – Local businesses, entrepreneurs, related others
- Bethanie Community Hall @ 10H00 – Local community such as, families, men, women, children, schools, hospitals, churches and any others.

Please feel free to distribute this information to any interested or affected person. Please supply any concerns or comments to our offices before or on **20 June 2017.**

Kind regards,

Ilze Rautenbach EAP, MPhil Environmental Management
Environmental Practitioner, Aurecon
F +264 61 2977007 M +264 61 2977011
Ilze.Rautenbach@aurecongroup.com
Aurecon Centre, 7 Newton Street, Windhoek Namibia
PO Box 5353, Ausspannplatz, Windhoek
aurecongroup.com

Bringing ideas to life

Ilze Rautenbach

From: Susan Mentor
Sent: Friday, June 9, 2017 8:57 AM
To: schmelenvillecs@gmail.com
Cc: Ilze Rautenbach
Subject: FW: Message from "RNP0026739C96CA"
Attachments: 20170609104121255.pdf

Hi All

Please find documents.

Regards.

Susan Mentor
Receptionist, Aurecon
F +264 61 2977007 M +264 61 2977000
Susan.Mentor@aurecongroup.com
-----Original Message-----
From: scans@aurecongroup.com [mailto:scans@aurecongroup.com]
Sent: Friday, June 09, 2017 8:41 AM
To: Susan Mentor <Susan.Mentor@aurecongroup.com>
Subject: Message from "RNP0026739C96CA"

This E-mail was sent from "RNP0026739C96CA" (MP C5503).

Scan Date: 06.09.2017 10:41:21 (+0300)
Queries to: scans@aurecongroup.com

Appendix B – Poster

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY – BETHANIE

Applicant: Namibia Water Corporation Ltd in collaboration with the Desert Research Foundation of Namibia (DRFN) with a Project Formulation Grant (PFG) from the Adaptation Fund

Environmental consultants: Aurecon Namibia

Project: This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

AF Funding Process: To be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through screening process
2) Environmental, social, and gender assessment (ESIA) – only risk identification at this stage
3) Environmental and social management plans (ESMP)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – data gathering
5) Public disclosure and consultation (stakeholder engagement)
6) Grievance mechanism developed.

How to Get Involved: Stakeholder engagement is an important part of the project and AF process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns.

Stakeholder engagement will take place in the form of public meetings scheduled as follows:

Tuesday, 13 June 2017 at;

Bethanie Village Council Hall @ 15H00 – Authorities such as Councillors, Headmen, Traditional Leaders

Wednesday, 14 June 2017 at;

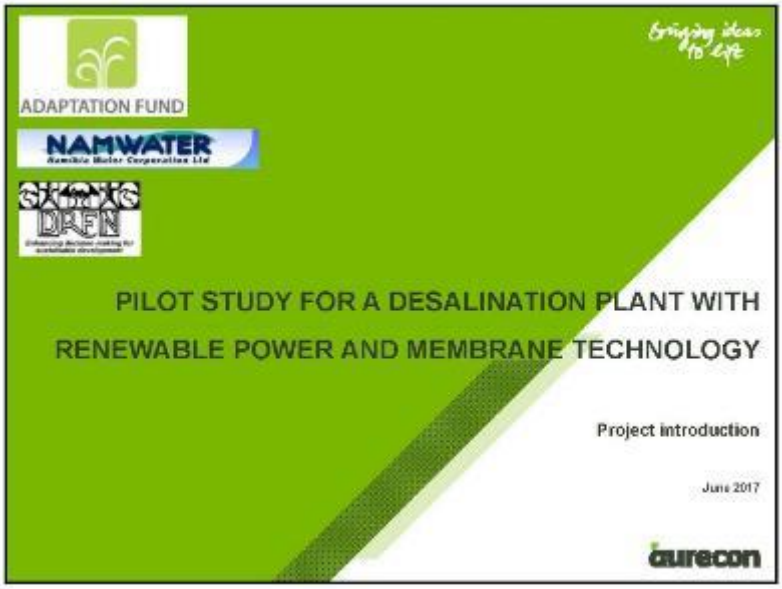
Bethanie Community Hall @ 08H00 – Local businesses, entrepreneurs, related others

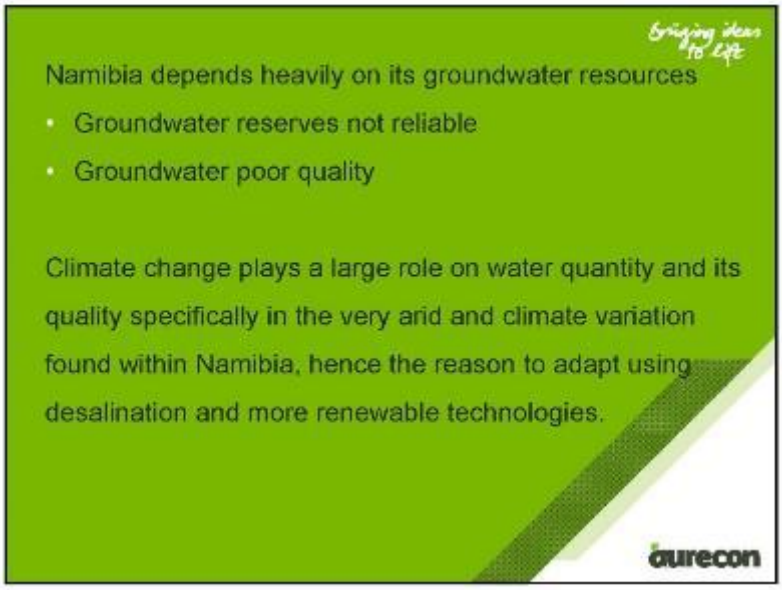
Bethanie Community Hall @ 10H00 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

ENVIRONMENTAL & SOCIAL CONSULTANT CONTACT

Mrs Ilze Rautenbach & Mrs Noeleen Greyling
Tel: +264 61 297 7000 / 11
Fax: +264 61 297 7007
Email: ilze.rautenbach@aurecongroup.com

Appendix C – Presentation





Project Goals

bringing ideas to life

This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

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bringing ideas to life

Namibia Water Corporation Ltd as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology.

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bringing ideas to life

Three sample villages were selected for this pilot project, i.e. Bethanie, Grunau and Epukiro Post 3.

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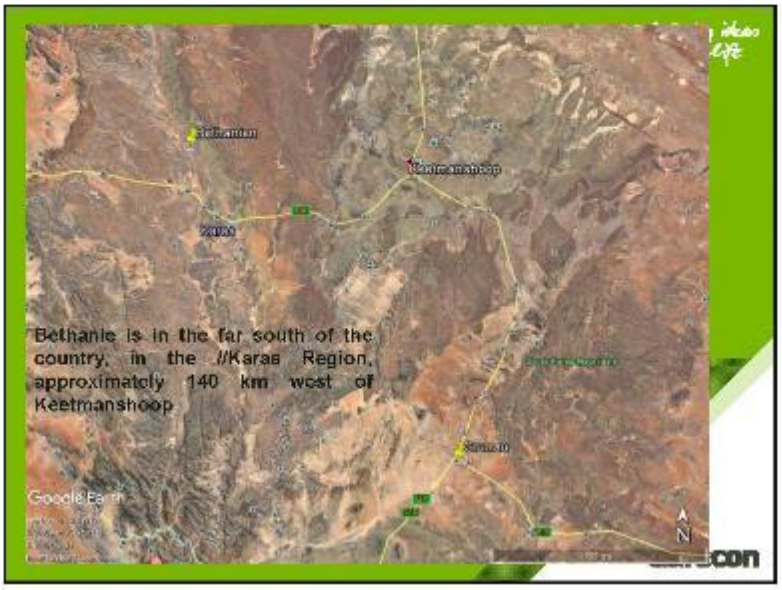

In Bethanie water from the local aquifer contains very high levels of fluoride (between 2.5 – 3.5mg/l) with a quality classification of Class C and D, which needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards.

A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

bringing ideas to life

The water source for Bethanie is not stressed but has a high fluoride content, which does not meet Namibia's Water Quality Standards, and impacts on the health of the local population, especially children. The plant will improve the product water to be used by the community.

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Project components

- Desalination plant and distribution of water
- Hybrid solar + wind power plant
- Training
- Sensitisation
- Pilot phase operation (2 years)
- Replication within Namibia

AF Funding Process

bringing ideas to life

In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through **screening process**
2) Environmental, social, and gender assessment (ESIA) – **only risk identification at this stage**
3) Environmental and social management plans (**ESMP**)
4) Environmental, social, and gender management monitoring, reporting, and evaluation **– data gathering**
5) Public disclosure and consultation (**stakeholders**)
6) **Grievance mechanism** developed

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How to Get Involved

bringing ideas to life

Tuesday, 13 June 2017 at:

- Bethanie Village Council Hall @ **15H00** – Authorities such as Councilors, Headmen, Traditional Leaders

Wednesday, 14 June 2017 at:

- Bethanie Community Hall @ **08H00** – Local businesses, entrepreneurs, related others
- Bethanie Community Hall @ **10H00** – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

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ENVIRONMENTAL & SOCIAL CONSULTANT
CONTACT
Mrs Ilze Rautenbach & Mrs Noeleen Greyling
Tel: +264 61 297 7000 / 11
Fax: +264 61 297 7007
Email: ilze.rautenbach@aurecongroup.com
P.O Box 5353 Ausspannplatz, Windhoek

Appendix D – BIDs

ADAPTATION FUND

LOODSSTUDIE VIR 'N ONTSOUTINGSAANLEG MET HERNUBARE KRAG EN MEMBRAANTEGNOLOGIE - BETHANIE

JUNIE 2016

AGTERGROND INLIGTINGSDOKUMENT

Inleiding

Die voorgestelde projek beoog om 'n metode te toets vir die verbetering van 'n versekerde voorraad van goeie kwaliteit grondwater aan klein dorpies in Namibië. Dit sal verder die veerkragtigheid van sulke gemeenskappe verbeter teen die verhoogde variasie in reënval wat met klimaatsverandering verwag word.

As 'n droë land maak Namibië baie staat op sy ondergrondse waterbronne. Dit bring twee uitdagings: veroorsaak hoë reenval variasie, wisseling van die herlaai van waterbronne dus is grondwaterreserwes is in baie plekke nie betroubaar nie. Tweedens is die kwaliteit van grondwater in baie plekke swak en onder die drempels vir sekere chemikalieë (bv. floried, en totale opgeloste vaststowwe en soutgehalte) vir veilige menslike gebruik. Dit vereis water behandelingstegnieke soos filtrasie en ontsouting wat weer energie in die vorm van elektrisiteit benodig.

As sulks het die Namibië Water Korporasie Edms as 'n uitvoerende entiteit in samewerking met die Woestyn Navorsingstigting van Namibië (WNSN) as 'n implenteringsentiteit, aansoek gedoen vir 'n Projek Formuleringstoelaag (PFT) by die Aanpassingsfonds. Die toelaag is toegeken vir die formulering van 'n volledige projekvoorleging op die Ontsouting van swak waterkwaliteit van die gekose behandelingsaanlegte wat Hernubare Krag en Membraantegnologie gebruik.

Drie voorbeeld dorpies is gekies vir hierdie loodsstudie, m.a.w **Bethanie**, Grunau en Epukiro Pos 3. In Bethanie bevat die water van die plaaslike waterbronne baie hoë vlakke *floried* (tussen 2.5 – 3.5mg/l) met 'n kwaliteit kwalifikasie van Klas C en D wat gesuiwer moet word deur 'n spesifieke ontwerpde ontsoutingsaanleg om te voldoen aan die vereiste van die Water Kwaliteitsstandaarde. 'n Klein skaalse hibriede son- en of windgedrewe elektisiteit genererende toestel sal geïmplimenteer word om die aanleg voort te dryf.

Indien suksesvol sal die projek 'n nuttige metode demonstreer wat uitgerol kan word om soortgelyke behoeftes in afgeleë gemeenskappe in Namibië by te kom en elders om die watersituasie vir afgeleë dorpe en nedersettings te verbeter in die gesig van klimaatsverandering.

DOEL VAN HIERDIE DOKUMENT

Die doel van hierdie AID is om vir alle aandeelhouers 'n agtergrond te gee oor die voorgestelde loodsstudies en om hulle uit te nooi om te registreer as Be angstellende en Geaffekteerde Partye (B&GPs). Deur te registreer as B&GPs kan aandeelhours kommentaar gee en insette lewer op die voorgestelde studies terwyl hulle ingelig sal bly tydens die projekproses.

Hersien asseblief hierdie AID en stuur u geskrewe kommentaar op skrif op of voor:
Dinsdag 20 Junie 2017

NAMWATER Namibia Water Corporation Ltd

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Voorgestelde Projek en Ligging

Bethanie is in die verre suide van die land, in die //Karasstreek, ongeveer 140km wes van Keetmanshoop – verwys na Figuur 1 hieronder. Bethanie verkry sy water van twee boorgate in die Konkieprivier, ongeveer 2 km weg van die dorp. Die watervoorraadskema word bestuur deur NamWater en die Bethanie Dorpsraad is verantwoordelik vir die bestuur van die waterdreinering. Die huidige bevolking word geskat op 3 000 mense.

Figuur 1: Die projek liggingskaart

Die hoofdoel van hierdie projek is om die effektiwiteit van 'n stelsel te toets wat hernubare energie kombineer met die behoeftes van die watersektor om die veerkragtigheid teen klimaatsverandering te verbeter. Die projek sal kleinskaalse son- en of wind gedrewe ontsoutingsaanlegte verfyn om die kwaliteit van gekose ondergrondse waterbronne vir menslike gebruik te verbeter en sal poog om die koste van water aan gemeenskappe wat deur hierdie skemas bedien word te verminder. 'n Suksesvolle demonstrasie van die metodes sal lei tot verdere uitrol aan ander plekke in die land.

Die waterbron vir Bethanie is nie onder druk nie maar het 'n hoë floriedinhoud wat nie aan Namibië se Water Kwaliteitsstandaarde voldoen nie en wat 'n impak op veral die gesondheid van kinders in die plaaslike gemeenskap het. Die aanleg sal help om die produkwater wat deur die gemeenskap gebruik sal word te verbeter.

AF Bevondsingsproses

Om vir befondsing aansoek te doen by die Aanpassingsfonds moet die volgende stappe in die Omgewings-en Maatskaplike Bestuurstelsel (OMBS) handleiding voltooi word. Hierdie stappe is as volg:

1) Identifisering van Omgewings, maatskaplike en geslagsrisiko's deur 'n **siftingsproses**
2) Omgewings, maatskaplike en geslagsassessering (OMGA) – **slegs risiko identifisering op hierdie stadium**
3) Omgewings en maatskaplike bestuursplanne **(OMBP)**
4) Omgewings, maatskaplike en geslagsbestuur monitering, rapportering en evaluering – **data-insameling**
5) Publieke bekendmaking en konsultering **(aandeelhouer betrokkenheid)**
6) **Griefmeganisme** ontwikkel

Hoe om Betrokke te Raak

Aandeelhouer betrokkenheid is 'n belangrike deel van die projek en AF proses, omdat dit die publiek toelaat om inligting oor die voorgestelde projek te bekom, om na dokumentasie te kyk, om insette te lewer en enige bekommernisse te lig. U is as potensiële B&GP vir hierdie projek identifiseer, of omdat u 'n geaffekteerde organisasie verteenwoordig of weens u nabyheid/ligging van die voorgestelde projek.

Aandeelhouer betrokkenheid sal plaasvind in die vorm van openbare vergaderings wat as volg geskeduleer is:

Dinsdag, 13 Junie 2017 by;

- Bethanie Dorp Stadsaal @ 15H00 – Owerhede soos Raadslede, Hoofmanne en Tradisionele Leiers

Woensdag, 14 Junie 2017 by;

- Bethanie Gemeenskapsaal @ 08H00 – Plaaslike besighede, entrepreneurs en ander wat verband hou
- Bethanie Gemeenskapsaal @ 10H00 – Plaaslike gemeenskap soos families, mans, vrouens, kinders, hospitale, kerke en enige ander.

OMGEWINGS- EN MAATSKAPLIKEKONSULTANT KONTAK

Mev. Ilze Rautenbach & Mev. Noeleen Greyling

Tel: +264 61 297 7000 / 11

Faks: +264 61 297 7007

E-pos: ilze.rautenbach@aurecongroup.com

aurecon

Posbus 5353 Ausspannplatz, Windhoek

NAMWATER Namibia Water Corporation Ltd

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ADAPTATION FUND

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY – BETHANIE

JUNE 2016

BACKGROUND INFORMATION DOCUMENT

Introduction

This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

As an arid country, Namibia depends heavily on its groundwater resources. This brings two challenges: high rainfall variability makes recharge into aquifers also variable, so groundwater reserves in many places are not reliable. Secondly, groundwater quality is poor in many places, below the thresholds for certain chemicals (e.g. fluoride, total dissolved solids and salinity) for safe human consumption. This requires water treatment techniques, such as filtration or desalination. These in turn demand energy in the form of electricity.

As such the Namibia Water Corporation Ltd as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology.

Three sample villages were selected for this pilot project, i.e. **Bethanie**, Grunau and Epukiro Post 3. In Bethanie water from the local aquifer contains very high levels of *fluoride* (between 2.5 – 3.5mg/l) with a quality classification of Class and D, which needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards. A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

If successful, this project will demonstrate a useful method that can be rolled out to meet similar needs in off-grid communities in Namibia and elsewhere to improve the water situation for remote villages and settlements in the face of climate change.

PURPOSE OF THIS DOCUMENT

The purpose of this BID is to provide all stakeholders with a background to the proposed pilot studies and to invite them to register as Interested and Affected Parties (I&APs). By registering as I&APs, stakeholders can submit comments and provide inputs on the proposed studies and will be kept informed throughout the project process.

Please review this BID and submit your comments in writing on or before:
Tuesday 20 June 2017

DRFN NAMWATER Namibia Water Corporation Ltd aurecon

Proposed Project and Location

Bethanie is in the far south of the country, in the //Karas Region, approximately 140 km west of Keetmanshoop – refer to Figure 1 below. Bethanie obtains its water from two boreholes in the Konkiep River, approximately 2 km away from the town. The water supply scheme is managed by NamWater and the Bethanie Village Council is responsible for the management of the water reticulation. The current population is estimated at 3 000 persons.

Figure 1: The project locality map

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes. A successful demonstration of the methods will enable further roll-out to other sites in the country.

The water source for Bethanie is not stressed but has a high fluoride content, which does not meet Namibia's Water Quality Standards, and impacts on the health of the local population, especially children. The plant will improve the product water to be used by the community.

AF Funding Process

In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through **screening process**
2) Environmental, social, and gender assessment (ESIA) **– only risk identification at this stage**
3) Environmental and social management plans (**ESMP**)
4) Environmental, social, and gender management monitoring, reporting, and evaluation **– data gathering**
5) Public disclosure and consultation (**stakeholder engagement**)
6) **Grievance mechanism** developed

How to Get Involved

Stakeholder engagement is an important part of the project and AF process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns. You have been identified as a potential I&AP for this project, either because you represent an affected organisation or because of your proximity/location to the proposed project.

Stakeholder engagement will take place in the form of public meetings scheduled as follows:

Tuesday, 13 June 2017 at;

- Bethanie Village Council Hall @ 15H00 – Authorities such as Councilors, Headmen, Traditional Leaders

Wednesday, 14 June 2017 at;

- Bethanie Community Hall @ 08H00 – Local businesses, entrepreneurs, related others
- Bethanie Community Hall @ 10H00 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

ENVIRONMENTAL & SOCIAL CONSULTANT CONTACT

Mrs Ilze Rautenbach & Mrs Noeleen Greyling
Tel: +264 61 297 7000 / 11
Fax: +264 61 297 7007
Email: ilze.rautenbach@aurecongroup.com

aurecon
P.O Box 5353 Ausspannplatz, Windhoek

NAMWATER Namibia Water Corporation Ltd

aurecon

Appendix E – Attendance Register and Stakeholder Database

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NAMWATER

ATTENDANCE REGISTER

MEETING: Community / Business / other VENUE: Bethanie Community Hall DATE & TIME: 2017/06/14 @ 07:00

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
37	Dawid Isaacks	M	F	42	Community Member	–	0813577264
38	Sonia Munguanda	M	F		Community Member	–	–
39	Louisa Boois	M	F	61	Community Member	–	081/695/1660
40	Elisa Kaynikos	M	F	58	" "	–	081 6 DSfS 08/625 11/3
41		M	F				
42		M	F				
43		M	F				
44		M	F				
45		M	F				
46		M	F				
47		M	F				
48		M	F				

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NAMWATER

ATTENDANCE REGISTER

MEETING: Community / Business / other VENUE: Bethanie Community Hall DATE & TIME: 2017/06/14 @ 07:00

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
1	Marcelle Pereo	M	F	42	[illegible] Chief Legal Clerk	[illegible]@gmail.com	[illegible]
2	Anna M. Andersen	M	F	60	House wife		0812036009
3	Francina [illegible]	M	F	5[illegible]	House wife		081[illegible]
4	L. Ezerms	M	F	21	[illegible]	[illegible]@gmail.com	[illegible]
5	N. v[illegible]	M	F	46	Personal		
6	John Sirunda	M	F	32	Head R&D Namwater	sirundaj@namwater.com.na	0811425082
7	Rebekka Boois	M	F				
8	Hilda Krafck	M	F				
9	Alois Kraafck	M	F				
10	A. Boois	M	F				
11	Dawid Boois	M	F	61			0817425390
12	D. Mobirsa	M	F	48	House wife		0814843370

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ATTENDANCE REGISTER

MEETING: Community/Business/Other VENUE: Bethanie Community Hall DATE & TIME: 2017/06/14 @ 09:00

No.	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
25	Esmien Mdingo	M	F ✓	25		dionesmien01@gmail.com	0817824592
26	Lucy Book	M	F ✓	56			0812591162
27	Dorrea Liebenberk	M	F ✓	56	councilor		0813993166
28	IRENE MEIN[illegible]	M	F ✓	46	Business woman &	Pickochilly@iway.na	0812879506
29	Hendrik Frederick	M ✓	F	56	Traditional - Councilor	—	0810383270
30	Miriam Nail	M	F ✓	57	Unemployed		0814529209
31	[illegible]	M	F ✓	41	unemployed		—
32	[illegible] Boois	M	F ✓	[illegible]	Unemployed		—
33	Johannes E Cloete	M ✓	F	19	Unemployed	ernstcloete8@gmail.com	0818154583
34	Ernst Edwin Cith	M ✓	F	42	UNEMPLOYED		0816176717
35	Fredrika Haidula	M	F ✓	42	Unemployed		0813283098
36	Isak Boois	M ✓	F		UNEMPLOYEB		0817415178

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ATTENDANCE REGISTER

MEETING: Community / Business / other VENUE: Bethanie Community Hall DATE & TIME: 2017/06/14 @ 07:00

No.	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
37	JANINE BEUKES-BETH V.C.	M	F ✓	27	Assistant Accountant	janinebeukes@yahoo.com	0814705544 068-283006
38	H.A. ENGELBRECHT	M ✓	F	64	Community member	houstingelbrecht1370@gmail.com	0812709777
39	Isak van Kent	M ✓	F	67	"		
40	Maria Magdelena Goliath	M	F ✓	34	"		0815969646
41	Christina Kisting	M	F ✓	59	Community member		0817602669
42	S Fredericks	M	F	49	Community member		0818475688
43	E. Boois	M	F	57			
44	S. Fredericks	M ✓	F	57			0818820358
45	Sara Fredericks	M	F ✓	63	Community member	—	—
46	Sanna Boois	M	F ✓	53	Community member	—	0813896153
47	Isak Rooi	M ✓	F	58	Councilor	—	0813070220 ~~0813020~~
48	Anna Stoop	M	F ✓	42	Community member		—

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ATTENDANCE REGISTER

MEETING: Councillors / Headmen & TRADITIONAL LEADERS VENUE: BETHANIE TOWN COUNCIL HALL DATE & TIME: 13 JUNE '17 15:00

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
1	Michael Manaleide	M	F		Acting CEO	[illegible]	081 2749799
2	Koenna Beuker	M	F	37	Councillor	koenbeukes@gmail.com	0812064485
3	Toha Kalili	M	F	25	HR Officer	tohakalili@gmail.com	081 123 3037
4		M	F				
5		M	F				
6		M	F				
7		M	F				
8		M	F				
9		M	F				
10		M	F				
11		M	F				
12		M	F				

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Bethanie Stakeholders

Name of Institution	Job Titles	Name of CEO/MD/Contact	Tel Number	Fax Number	e-mail Address	Postal Address
Karas Regional Council	Chief Reg Officer	Saul Kahuika	063-221900	063-223538	skahuika@karasrc.gov.na	P/Bag 2184, Keetmanshoop
Karas	Governor	Hon. Lucia Basson	063-225627/ 0811284067	063-222714 / 223538	mstephanus@kharasog.gov.na lbasson@kharasog.gov.na	P/Bag 22189, Keetmanshoop
/Karas Region	Director	Mr /Awebahe J //Hoeseb	063-227001	063-223800	awebahehoeseb@yahoo.com	P/Bag 2160, Keetmanshoop
Chief Medical Officer Karas Region	Director	J. Ndile	063-220900	063-222590	ndile_jrn@yahoo.com	P/Bag 2101, Keetmanshoop
Director of Health Hardap	Director(Acting)	Mr J.P Tshitende	063-245500	063-242727	jptshitende@yahoo.com	P/Bag 2014, Mariental
Karas Regional Health Directorate	Director	Mr. Barth Muntenda	063-2209187/8 0812294441		barth.muntenda@gmail.com	
Bethanie Village Council	Acting	Otto Shipanga	063-283006	063-283107	cahr@ltc.com.na betvil@iway.na	P.O. Box 74, Bethanie
Bethanie Village Council	**Acting CEO at Bethanie Village Council**	**Ndamononghenda Namulo**	**0813634917**		**ndnamulo@gmail.com**	
Bethanie Health Centre and Bethanie Village Council	Chairperson of Bethanie Village Council and Superintendent at Bethanie Health centre	Aletha Frederick	0816847802		alethafrederick@gamil.com	
Bethanie Village Council	Town Foreman	Frans Windstaan	081273537		windstaanfrans@gmail.com	
Bethanie Village Council	Fireman	Piet Frederick	0817438900		pietfrederick@gmail.com	
Bethanie Village Council	Artisan	Abraham Eixab	0815579572			
NamWater	Research and Development	Johannes J Sirunda	0811450613		sirundaj@namwater.com.na	
NamWater	**Chief Water Supply South**	**Kok Andries**	**0811272715**		**KokA@namwater.com.na**	
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St. Joseph's Primary School			+264 (063) 283024			
Health Centre			063-283026			
Standard Bank Namibia			+ 264 63 283003	+ 264 63 283122		Box 28 Bethanie
Namibia Post			063 283 161			
Telecom Namibia			063 284 900	063 284 911		
Bethanie Uistrusters & Motor			063 283 007			PO Box 60 Bethanie

NAME & SURNAME	GENDER	AGE	POSITION / INTEREST	EMAIL ADDRESS	CONTACT DETAILS	Postal Address
Marcelle Pienaar	F	42	Office of the Judiciary - Chief Legal Clerk	mashbooiso49@gmail.com	(81) 488-0428	
Anna M. Anderson	F	60	House Wife		(81) 203-4609	
Franzina Syster	F	59	House Wife		(81) 273-5598	
L. Boois	M	41	Farmer	jackielboois@gmail.com	(81) 439-4341	Box 84 Bethanie
M. Van Koni	F	76	Pensioner			
John Sirunda	M	32	Head - R & D Namwater	sirundaj@namwater.co.na	(81) 142-9082	
Rebekka Boois	F	78	Community Member			
Hilda Kooper	F	69	Community Member			
Klaas Kooper	M	74	Community Member			
R. Rooi	M		Community Member			
Dawid Boois	M	61	Community Member		(81) 792-5390	
D. Motinga	F	48	House Wife		(81) 484-2220	
Esmien Motinga	F	25	Community Member	dianaesmien@gmail.com	(81) 782-4592	
Lucy Bok	F	56	Community Member		(81) 259-1162	
Doriua Frederik	F	56	Councillor		(81) 399-3166	
Irene Meintjies	F	46	Business Woman	rickadilly@iway.na	(81) 287-9506	
Hendrik Frededik	M	56	Traditional Councillor		(81) 038-3270	

Miriam Nail	F	57	Unemployed		(81) 452-9209	
Jannietjie Rooi	F	41	Unemployed			
Rebekka Boois	F	44	Unemployed			
Johannes E. Cloete	M	19	Unemployed	erntcloete8@gmail.com	(81) 815-4583	
Ernst Edwin Uth	M	42	Unemployed		(81) 617-6717	
Fredrika Haidula	F	42	Unemployed		(63) 128-3098	
Isak Boois	M	56	Unemployed		(81) 741-5178	
Janine Beukes-Beth VC	F	27	Assistant Accountant	janinebeukes@yahoo.com	(81) 420-5544	(6) 328-3006
A. Engelbrecht	M	64	Community Member	hansengelbrecht137@gmail.com	(81) 270-9777	
Isak Van Kent	M	67	Community Member			
Maria Magdelena Goliath	F	34	Community Member		(81) 596-9644	
Christina Kisting	F	55	Community Member		(81) 760-2669	
S. Fredericks	F	49	Community Member		(81) 347-5688	
F. Boois	F	57	Community Member			
S. Fredericks	M	57	Community Member		(81) 832-0338	
Sara Frederick	F	63	Community Member			
Sanna Boois	F	53	Community Member		(81) 389-6153	
Isac Rooi	M	58	Councillor		(81) 309-0220	
Anna S. Booi	F	42	Community Member			
Dawid Isaacks	M	42	Community Member		(81) 357-1269	
Sanna Mungunda	F	53	Community Member		(81) 357-1269	
Louda Boois	F	61	Community Member		(81) 695-1660	
Linda Kayngos	F	58	Community Member		(81) 685-1113	
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Appendix F – Survey data

Name and Surname	Village / Dorpnaam	Gender / Geslag	Disabled / Gestremd	Age / Ouderdom	Employment status / Werkstatus	Where do you get your drinking water from / Waar kry jy jou drinkwater vandaan?	How far do you travel to get water? / Hoe ver moet jy reis om water te kry?	Do you pay for your drink water? / Betaal jy vir jou drinkwater?	How much do you pay per month? / Hoeveel betaal jy per maand?	Is the water expensive? / Is die water duur?	Is the water supply reliable? / Is die waterbron betroubaar?	What is the quality of your drinking water? / Wat is die kwaliteit van jou drinkwater?	What impact / influence does the quality and availability of water have on your life? E.g. Health and safety impacts, financial, gender vulnerability, etc. / Watse impak / invloed het die kwaliteit en beskikbaarheid van water op jou lewe? Bv. Gesondheids- en veiligheidsimpak, finansiële, geslags, kwesbaarheid, ens.
Dawid Isaacks	Bethanie	Male	No	42	Unemployed	NamWater	In the Yard	Yes	200	Yes	Yes	Acceptable	Baie duur, het nie werk en man oorlede
Miriam Nail	Bethanie	Female	No	57	Unemployed	NamWater	In the Yard	Yes	200	Yes	Yes	Acceptable	Finansiele, kwaliteit van water, gesondheid-tand probleme
Hulda Kooper	Bethanie	Female	No	69	Employed	Local Authority	In the Yard	Yes	250	Yes	Yes	Acceptable	1). Health 2). Yellow Teeth - Even when using Toothpaste
Janine Beukes	Bethanie	Female	No	27	Employed	Local Authority	In the Yard	Yes	300	Yes	Yes	Acceptable	Gesondheid-tande raak geel, almal wat hier bly se tande geel en gebruik tandepaste
Esmien Motinga	Bethanie	Female	No	25	Unemployed	Local Authority	In the Yard	Yes	340	Yes	Yes	Acceptable	goed wees vir ons
Sanna Boois	Bethanie	Female	No	53	Employed	Local Authority	In the Yard	Yes	1400	Yes	Yes	Acceptable	Water baie vol kalk
Bak van Keit	Bethanie	Male	No	67	Unemployed	Local Authority	In the Yard	Yes	150	Yes	No	Poor	Souterige water met baie kalk en gee tand probleme
Dina Metinga	Bethanie	Female	No	48	Unemployed	Local Authority	In the Yard	Yes	200	Yes	No	Poor	Dis D class water en veroorsaak dat die tande bruin en bross raak, sommige mense kry maag probleme
Dawid Boois	Bethanie	Male	No	61	Unemployed	Local Authority	In the Yard	Yes	200	Yes	No	Poor	Bene, Maag,Niere,Vel,Selfbeeld,Hare en baie kalk
Hendrik Dorina Frederik	Bethanie	Male	No	56	Unemployed	NamWater	In the Yard	Yes	200	Yes	No	Poor	Baie kalk in die water
Isak Boois	Bethanie	Male	No	56	Unemployed	Local Authority	5 m	Yes	250	Yes	Yes	Poor	Salty, brown teeth, maagkramp
Sarrafien Frederik	Bethanie	Female	No	63	Employed	Local Authority	In the Yard	Yes	250	Yes	No	Poor	Baie kalk in die water
Erwe Rooi	Bethanie	Male	No	74	Unemployed	Local Authority	5 km	Yes	300	Yes	Yes	Poor	1). Bad Taste 2). Brown teeth
Jannietjie Rooi	Bethanie	Female	No	41	Unemployed	Local Authority	In the Yard	Yes	300	Yes	No	Poor	Health and safety- aanpaksels van kalk in ketels en toilet, water is duur, swak vir plante en groente gebruik.
Ernst Edwin Lith	Bethanie	Male	Yes	42	Unemployed	NamWater	In the Yard	Yes	300	Yes	No	Poor	Tande, niere,Bene,Maag,Selfbeeld,Hare en vel
Anna M. Anderson	Bethanie	Female	No	60	Unemployed	Local Authority	In the Yard	Yes	400	Yes	Yes	Poor	Oë en liggaam , biae duur
Margrieta van Kemp	Bethanie	Female	No	76	Unemployed	NamWater	5 km	Yes	50	Yes	Yes	Very good	
Maria Mqagdelena Golialh	Bethanie	Female	No	34	Employed	Local Authority	In the Yard	Yes	41	Yes	Yes	Very poor	Baie min wat Nam water doen om water te suiwer en dan verkoop teen duurste, verswak ons tande, dit lui tot ons wat nie kan kompeteer vir werk in ander dorpe nie, lui tot werkloosheid en gemeeskap word gedemoraliseer.
Johannes E Cloete	Bethanie	Male	No	19	Unemployed	Local Authority	In the Yard	Yes	100	No	No	Very poor	Gesondheid-sleg vir ons liggaam, kan nie tuin nat maak met water nie, sukkel om wasgoed skoon te kry agv water,hare breek agv water
Marcelle Pienaar	Bethanie	Female	No	42	Unemployed	Local Authority	100 m	Yes	200	Yes	Yes	Very poor	Baie duur, kort asem, been pyn
Fredrika maidula	Bethanie	Female	No	42	Unemployed	Local Authority	100 m	Yes	200	Yes	Yes	Very poor	Op pensioen, water baie duur
Isak Rooi	Bethanie	Male	No	58	Unemployed	NamWater	130 m	Yes	200	No	Yes	Very poor	Moet ry om water te koop
Francia Saster	Bethanie	Female	No	59	Unemployed	Local Authority	In the Yard	Yes	200	Yes	Yes	Very poor	Liggaam bene en bors pyn, hoofpyn
Klaas kooper	Bethanie	Male	No	74	Self Employed	Local Authority	In the Yard	Yes	200	Yes	Yes	Very poor	1). Health 2). Teeth Canses. Low Self esteem 3). Impacts kettines in the house and water pipes. 4). Bad taste. Not good for vegetable gardens due to heavy salt content.
Hans A. Engelbrecht	Bethanie	Male	No	64	Unemployed		In the Yard	Yes	200	Yes	No	Very poor	Gesondheid, verbruin tande en maagwerkings, water baie duur
Irene Melatjies	Bethanie	Female	No	46	Unemployed	NamWater	In the Yard	Yes	300	Yes	No	Very poor	Bene, Maag,Niere,Vel,Selfbeeld,Hare en baie kalk
Levie Boois (Jackie)	Bethanie	Male	No	41	Employed	NamWater	In the Yard	Yes	350	Yes	Yes	Very poor	Health of tande,duur, smaak sleg,costly to visit dentist and far
Rebecca Boois	Bethanie	Female	No	78	Unemployed	Local Authority	In the Yard	Yes	370	No	No	Very poor	
Christina Kisting	Bethanie	Female	No	55	Unemployed	Local Authority	In the Yard	Yes	1000	Yes	No	Very poor	Bruin tande, Smaak sleg, Selfbeeld
Lucy Boio	Bethanie	Female	No	56	Unemployed	Local Authority	In the Yard	Yes	1000	Yes	No	Very poor	Bruin tande, Smaak sleg, duur

Appendix G – Grievance Mechanism

Document control record

Document prepared by:

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Abbreviations

ACHM	Ad Hoc Complaint Handling Mechanism
BID	Background Information Documents
CBO	Community Based Organisation
CDC	Community Development Committee
CEO	Chief Executive Officer
CMHC	Counselling and Mental Health Centre
DRFN	Desert Research Foundation of Namibia
EE	Executing entity
ESIA	Environmental, social, and gender assessment
ESMP	Environmental and social management plans
ESMS	Environmental and Social Management System
HIV/ AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HR	Human resources
IFC	International Finance Corporation
IPPR	Institute for Public Policy Research
NamWater	Namibia Water Corporation Ltd
NCPE	National Commission for the Promotion of Equality
NIE	National implementing entity
NGO	Non-governmental organisation
PFG	Project Formulation Grant
PS	Performance standard
STI's	Sexually transmitted diseases
TB	Tuberculosis
UNDP	United Nations Development Programme

1 Provisions for redress of grievances

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities.

The Adaptation Fund (Fund) makes the ACHM available to Implementing Entities and members of the communities that are adversely affected by the implementation of project / programmes funded by the Fund. The purpose of the ACHM is to assist in responding to complaints raised against project / programmes funded by the Fund through a participatory approach.

Complainants and implementing entities should use the implementing entity's grievance mechanism as a first step. However, the ACHM can be used in cases where the Parties have failed to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year. The ACHM requires a written submission of a complaint by at least one of the Parties.

The Adaptation Fund Board secretariat (secretariat) will independently manage all aspects related to complaint handling, under the oversight of the Ethics and Finance Committee (EFC) of the Adaptation Fund Board (Board).

The ACHM builds on alternative dispute resolution techniques. Main features of the ACHM are to effectively facilitate dialogue among stakeholders, mediate/assist in resolving issues raised, and develop and share lessons to improve future operations.

Adaptation Fund
Ad Hoc Complaint Handling Mechanism (ACHM)

Grievance mechanisms are an important part of IFC's approach to requirements related to community engagement by clients under the Policy and Performance Standards on Social and Environmental Sustainability. Where it is anticipated that a new project or existing company operations will involve ongoing risk and adverse impacts on surrounding communities, the client will be required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the client's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies. The client will inform the affected communities about the mechanism in the course of its community engagement process (PS 1, Paragraph 23).

A grievance mechanism should be able to deal with most of the community issues that are covered by IFC's Performance Standards. Grievance mechanism requirements in relation to affected communities are explicitly stated with regard to security personnel (PS 4, Paragraph 13), land acquisition (PS 5, Paragraph 10), and adverse impacts on indigenous peoples (PS 7, Paragraph 9). The contractor will be asked to design the mechanism according to the extent of risks and adverse impacts of the project. Impacts on communities are evaluated within the Social and Environmental Assessment for a project.

Grievance mechanisms inform and complement but do not replace other forms of stakeholder engagement. Stakeholder engagement also includes stakeholder identification and analysis, information disclosure, stakeholder consultation, negotiations and partnerships, stakeholder involvement in project monitoring, and reporting to stakeholders. If strategically applied throughout the project life, an integrated range of stakeholder-engagement approaches can help build trust, contribute to maintaining broad community support for the project, and ultimately help companies promote the long-term viability of their investments.

1.1 What is grievance

The Good Practice Note[1] defines a grievance as a concern or complaint raised by an individual or a group within communities affected by project construction and company operations. Both concerns and complaints can result from either real or perceived impacts, and may be filed in the same manner and handled with the same procedure. The difference between responses to a concern or to a complaint may be in the specific approaches and the amount of time needed to resolve it. The term 'grievance' implies that there may be a problem. In practice, however, the nature of feedback that communities may want to bring to a contractor's attention will vary, since communities often find it appropriate to use the same channels to communicate not only grievances but also questions, requests for information, and suggestions. Communities may even use these channels to convey what they think the company/contractor is doing well.

The client should keep in mind that unanswered questions or ignored requests for information have the potential to become problems and should, therefore, be addressed promptly. It is good practice to respond to community feedback through the relevant pillars of community engagement, such as disclosure, consultation, and participation in project monitoring. For example, a question about specific benefits the project provides or intends to provide to women in the community can be forwarded to a community liaison or a staff member who specifically deals with gender matters, if such person has been appointed by the project. The person(s) who asked this question are then notified as to who will respond and by when.

1.2 Project-level grievance mechanism

A project-level grievance mechanism for affected communities is a process for receiving, evaluating, and addressing project-related grievances from affected communities at the level of the company, or project. In the context of this projects, this mechanism may also address grievances against contractors and subcontractors. Project-level grievance mechanisms offer companies/contractors and affected communities an alternative to external dispute resolution processes (legal or administrative systems or other public or civic mechanisms). These grievance mechanisms differ from other forms of dispute resolution in that they offer the advantage of a locally based, simplified, and mutually beneficial way to settle issues within the framework of the contractor–

[1] IFC Good Practice Note: Addressing Grievances from Project Affected Communities. 2009. Available from available at http://www.ifc.org/ifcext/sustainability.nsf/Content/Publications_GoodPractice. Accessed on 18th August 2014.

community relationship, while recognising the right of complainants to take their grievances to a formal dispute body or other external dispute-resolution mechanisms.

It should be noted, however, that complex issues that arise from high environmental and social impacts are seldom resolved in a relatively simple way. In such cases, projects should anticipate involvement of various third parties in the resolution process to achieve solutions with affected communities. These include, but are not limited to, various national and international mediation bodies, independent mediators and facilitators with sector- and country-specific expertise, and independent accountability mechanisms of public sector financiers.

> ***Keep your grievance mechanism operational.***
> *Once the construction period is over, the project is likely to experience a decrease in the number of complaints. This may be because the issues previously raised have now been resolved, or because the "moment of maximum impact" has passed. While this might mean that a company can scale down the level of resources it was devoting to the day-to-day management of grievances, there should always be a well-functioning procedure for receiving and addressing public concerns whenever they may arise throughout the life of the project.*
> *IFC*

2 Approach to grievance redress

2.1 Local community grievance procedure structure

The grievance procedure currently utilised by the Bethanie, Grünau and Epukiro communities are that the grievances go through the Local Village Council and the Community Development Committee (CDC). The CDC is made up of representatives from:

- The Local Council;
- Churches;
- Schools;
- NamWater;
- NamPower;
- Elders;
- Youth; and
- Business owners.

The CDC is not as active as it could be and it is recommended that this committee be revived and revised to be able to be the contact point between the project and the local community, and handle all grievances. The community indicated that this is the way they would prefer grievances to be handled. They also stipulated that dates must be set for CDC meetings so that continuous communication between the project and the community can be a reality.

2.2 National implementing entity (NIE) - DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities. Please see the Ad Hoc Complaint Handling Mechanism (ACHM) as approved in October 2016 in Appendix A.

2.3 Executing entity (EE) - NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)
- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments
- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation. Please see the NamWater Grievance Handling in Appendix B.

2.4 Grievance mechanisms needed for projects implemented

Although a company generally differentiates between the actions of its own employees and those of contractors and subcontractors, local communities tend to see no difference and will attribute actions of contractors and subcontractors to the company. This is the case even if contractors are in the country only for a short period of time.

Companies need to anticipate grievances that may arise from the actions of suppliers or contractors, and implement a policy and management tools, such as regular monitoring to govern their behavior and actions, including provisions for coordinated management of grievances and key indicators that help evaluate the effectiveness of contractors' policies and tools. Where there are a small number of contractors, it may be feasible for the contractors to establish and manage their own grievance mechanisms. Companies will need to make sure that these mechanisms do not conflict with the company mechanism or those of the other contractors by establishing clear guidelines and ensuring oversight. Where contractual relationships are more complex or numerous, companies may wish to have all grievances directed to the company's mechanism, regardless of whether they relate to the company or its contractors or subcontractors.

Handling grievances encompasses a step-by-step process as well as assigned responsibilities for their proper completion. Figure 1 below provides **procedure on how grievance** should be received, registered and tracked. Contractors establishing grievance mechanisms will follow the process steps discussed in this section.

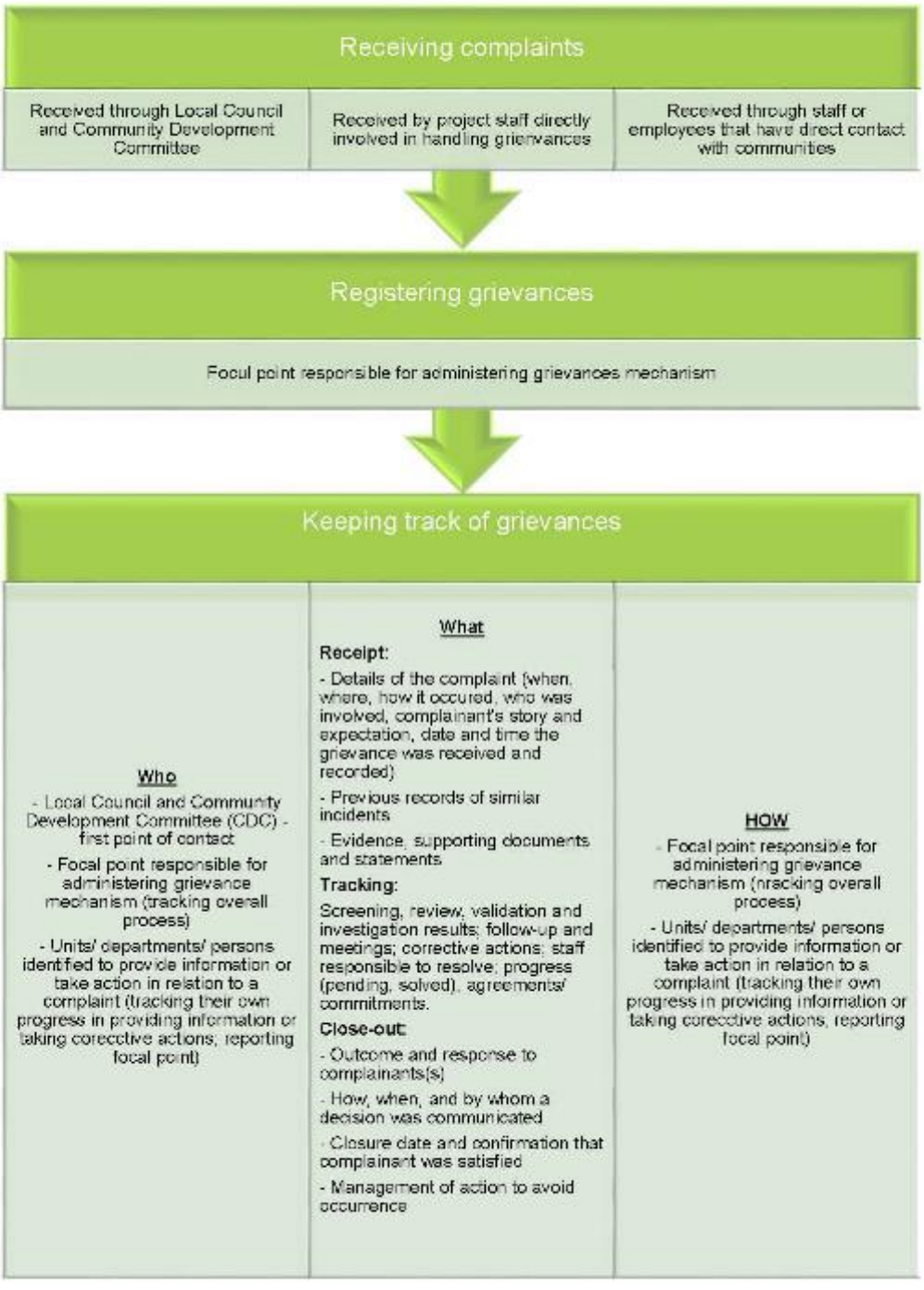

Figure 1: Receipt, registration and tracking of grievances

2.5 Step 1: Publicising grievance management procedures

When and how the grievance mechanism is introduced to affected communities can have significant implications for its effectiveness over time. Guiding principles for publicising a grievance mechanism should be in line with cultural characteristics and accessibility factors of affected communities. The information should include at least the following:

- What project-level mechanisms are (and are not) capable of delivering and what benefits complainants can receive from using the contractor's grievance mechanism, as opposed to other resolution mechanisms;
- Who can raise complaints (affected communities)
- Where, when, and how community members can file complaints;
- Who is responsible for receiving and responding to complaints, and any external parties that can take complaints from communities;
- What sort of response complainants can expect from the contractor, including timing of response; and
- What other rights and protection are guaranteed. Ideally, as part of their first interactions with company representatives, communities should be informed of a contractor's intention to establish a grievance mechanism, and continue to be reminded of this mechanism on a regular basis during project implementation. Contractors should emphasize the objectives of the grievance system and the issues it is designed to address. A contractor's community liaison officers, grievance officers, or individuals working in analogous positions, should be responsible for publicising the procedure through appropriate methods.

2.6 Step 2: Receiving and keeping track of grievances

Once communities are aware of the mechanism and access it to raise grievances, the contractor needs to process them. Processing includes:

- Collecting grievances;
- Recording grievances as they come in;
- Registering them in a central place; and
- Tracking them throughout the processing cycle to reflect their status and important details.

2.6.1 Receiving concerns and complaints

Below are simple rules that any receipt procedure for grievances should follow:

- All incoming grievances should be acknowledged as soon as possible. A formal confirmation with a complaint number, or other identifier, and a timeline for response assures the complainant that the organisation is responding properly, and it gives the project a record of the allegation. If a complaint is received in person, a good practice is to acknowledge it on the spot.

- If a more complex investigation is required, the complainant should receive an update explaining the actions required to resolve the complaint, and the likely timeline.
- The contractor should explain up front what claims clearly are outside the scope of the mechanism and what alternative avenues communities can use to address these potential issues.

2.6.2 Step 3: Reviewing and investigating grievances

For a grievance mechanism to work, all complaints should be handled as promptly as possible, depending on the nature and complexity of the matter. The central unit or person responsible for grievance handling should organise the process to validate the complaint's legitimacy and arrange for investigation of details. Depending on the circumstances of the complaint, various units or departments may need to get involved, including senior management if their direction and decision is required by the established procedures and division of responsibilities. To begin this process, establish the nature of the grievance to determine the measures needed for review and investigation. All grievances will need to undergo some degree of review and investigation, depending on the type of grievance and clarity of circumstances. For example: Minor, straightforward issues may only need screening before proceeding to the next step (resolution options and response). Review of minor issues, especially those related to a complainant's request for information, can generally be handled easily by providing information on the spot, or referring the person to community liaison personnel. If there is any possibility that deeper underlying issues may exist, always take time to look into the complaint further.

Less clear, more problematic, or repetitive issues, or group complaints may need a more detailed review prior to action. Staff involved in handling grievances may need to seek advice internally, and in some cases turn to outside parties to help in the validation process, especially in cases of damage claims. One option to help determine legitimacy is an internal committee comprising staff who will be involved in the operation, staff involved in supervision of the grievance mechanism, and managers from the project departments whose activities are likely to result in claims. For example, the committee might consist a community liaison officer and an operations manager. This committee can also provide initial recommendations on resolution options.

2.6.3 Where an extensive investigation is required

An extensive investigation may be required when grievances are complex or widespread and cannot be resolved quickly. As a way to conform to the principle of "no cost to communities," the contractor should take full responsibility for investigating the details of grievances coming through its grievance mechanism. However, in cases of sensitive grievances such as those involving multiple interests and a large number of affected people, it may help to engage outside organisations in a joint investigation, or allow for participation by Community Development Committee, civil society organizations or NGOs, or local authorities, if the complainants agree to this approach.

For controversial projects, consider establishing an independent monitoring panel.
In some cases, where a project is particularly complex or controversial for instance, an independent monitoring panel may be useful for maximum objectivity and transparency. This panel, which might include stakeholder representatives, internationally recognized experts, and eminent persons, can oversee and report on the project's environmental and social performance
IFC

2.6.4 Step 4: Developing resolution options and preparing a response

Once the grievance is well understood, resolution options can be developed taking into consideration community preferences, project policy, past experience, current issues, and potential outcomes. The following approach is proposed:

- A risk-based assessment of potential grievances disputes or conflicts that may arise during project preparation and implementation;
- Identification of the client s existing capacity for grievance redress; and
- An action plan that identifies priority areas for strengthening grievance capacity, or if necessary, establishing new mechanisms at the project level. Where applicable, dedicated resources should be allocated for realisation of the action plan

Developing resolutions options commensurate with the nature of the grievance

General approaches to grievance resolution may include proposing a solution:

- Unilaterally (the contractor proposes a solution);
- Bilaterally (the contractor and the complainant reach a resolution through discussion or negotiation);
- Through a third party (either informally or formally through mediation); or
- Through traditional and customary practices.

One of the potential advantages of a grievance mechanism is its flexibility. Rather than prescribe a specific procedure for each particular type of complaint, it may be helpful to establish a "menu" of possible options appropriate for different types of grievances, so that contractor personnel and community members have models for action when a dispute arises. Options include altering or halting harmful activities or restricting their timing and scope, providing monetary compensation, providing an apology, replacing lost property, revising community engagement strategy, and renegotiating existing commitments

Preparing and communicating clear response

Regardless of the outcome, a response should be provided to all complainants. Responses can be either oral or written, depending on whether the grievance was received orally or in writing. At the time of first interaction between the contractor representative and complainant(s), there are two possible scenarios:

The claim is rejected and no further action will be taken. If a claim is rejected upfront, it is either ineligible or clearly does not have a basis. If the response is that the grievance does not require action by the contractor to resolve it, all considerations should be documented and included in both the response and the contractor systems for grievance tracking for further reference. Contractors should be diplomatic when telling community members that no further action will be taken, since they are likely to be disappointed. But including a detailed and respectful explanation, together with compelling evidence of why it cannot be accepted, usually keeps a conflict from escalating. The claim is accepted. The response procedure would include two general steps:

1. A preliminary response should be provided within a stipulated period of time and should propose the next steps and actions to be taken for resolution. Let complainants know the results of the assessment and the status of their claims, and encourage and invite further discussion with complainants (to obtain additional arguments, collect more evidence, conduct further investigation, and launch a dialogue). If complainants are not likely to be satisfied with the outcome the contractor is considering, schedule group or individual meetings, as needed, to discuss the findings and further clarify the position of the contractor and of the complainants; and, in more complex cases, have management participate in such meetings, since they are perceived to be the legitimate decision makers.

2. A final response should be given to document the final proposed resolution. Communicate the proposal, stipulate mutual commitments, and ask for the complainants' agreement. If the complainants are not satisfied with the proposed resolution, or the outcome of the agreed corrective actions, they should be free to take their grievances to a dispute resolution mechanism outside of the contractor grievance mechanism.

Close out cases only when an agreement with complainants is reached

Following completion of the agreed-upon corrective actions, it is a good practice to collect proof that those actions have taken place. For example:

- Take photos or collect other documentary evidence to form a comprehensive record of the grievance and how it was resolved;
- Create a record of resolution internally, with the date and time it took place, and have responsible staff sign off;
- Have a meeting with the complainants to get a collective agreement to close out the claim; and
- If the issue was resolved to the satisfaction of the complainants, get a confirmation and file it along with the case documentation.

2.6.5 Step 5: Monitoring, reporting, and evaluating a grievance mechanism

Monitoring and reporting can be tools for measuring the effectiveness of the grievance mechanism and the efficient use of resources, and for determining broad trends and recurring problems so they can be resolved proactively before they become points of contention. Monitoring helps identify common or recurrent claims that may require structural solutions or a policy change, and it enables the contractor to capture any lessons learned in addressing grievances. Monitoring and reporting also create a base level of information that can be used by the contractor to report back to communities. Although internal monitoring is usually sufficient for smaller projects, in the case of projects with significant impacts, or where the facts surrounding the grievance are contentious, monitoring by a neutral third party can enhance the credibility of the grievance mechanism.

Tracking grievance statistics to ascertain effectiveness

Depending on the extent of project impacts and the volume of grievances, monitoring measures can be as simple as tracking the number of grievances received and resolved, or as complex as involving independent third-party evaluations. Apart from reviewing each grievance and analysing effectiveness and efficiency, companies also can use complaints to analyse systemic deficiencies. Grievance records should provide the background information for regular monitoring, both informal and formal. Therefore, even a simple tracking system should provide an opportunity to aggregate information and recognise patterns in the grievances the contractor receives, and how they are being resolved.

Adapting the mechanism to correct effectiveness

The final objective of monitoring is to ensure that the design and implementation of the grievance mechanism adequately respond to the stakeholders' needs in a cost-effective manner.

To maintain the mechanism's effectiveness, the contractor must design the mechanism and assign responsibilities to allow for policies and practices to improve efficiencies in the receipt and resolution of grievances. These objectives can be met only through ongoing adjustments to the mechanism, facilitated by support from the management. For example:

- If communities strongly prefer one of several channels offered to submit grievances, focus contractor resources on that channel to lower the costs of methods that communities do not use;
- If only one subgroup in the community raises complaints (for example, women, elderly), determine whether this phenomenon is the result of a particularly high impact of operations on that specific group or an accessibility issue;
- If a large number of grievances do not get resolved through the mechanism, a major change may be required in how the contractor approaches resolution, rather than focusing efforts on resolving individual issues; and

- If the grievances allege that the mechanism lacks transparency, adjust the policy and methods used to publicise it, put more emphasis on inviting the community to participate in decision making through the grievance mechanism, and consider involving third parties.

Using monitoring results to report back

Lessons learned throughout the process of handling grievances can help ensure continual improvement of the contractor's operations. The contractor can also use monitoring to report back to the community on its implementation of the mechanism. In addition, the contractor can designate personnel responsible for translating lessons learned from its monitoring into concrete policy and practice changes for the contractor. A community meeting to explain the results of such reports is also effective, and may lead to a mutually respectful relationship between the contractor and the community.

3 Resources needed to manage a grievance mechanism

3.1 Resources for grievance mechanisms

Grievance mechanisms will be effective if adequate resources; people, systems and processes, and associated financial resources are assigned to implementation, and if responsibilities are clearly defined. Grievance management should be recognised as a business function with clearly defined objectives, assigned responsibilities, timelines, budget, senior management oversight, and regular reporting. For these reasons, grievance mechanisms should be placed within a larger context of a social and environmental management system and should serve as one of the indicators of whether the system is functioning properly. The ultimate responsibility for designing, implementing, and monitoring project-level grievance mechanisms should lie with senior management.

3.2 Who should be responsible for implementation?

For a grievance mechanism to function effectively, it is important to determine a governance structure and assign responsibilities for the mechanism's implementation. The following basic preparations should be taken into account when evaluating resources and allocating responsibilities for grievance mechanism implementation:

- Make sure that the role of senior management is clear, i.e. in what cases and at what stage in the handling of a complaint their decision will be required, and who will be responsible for strategic oversight of grievance management. Senior management has final authority to ensure that commitments to affected communities are met, and clear reporting lines must be established between senior management and those implementing the grievance mechanism.

- Identify personnel or a unit responsible for administering the grievance mechanism (recording complaints, arranging for collection of additional information, consulting relevant departments or persons within the organization, tracking progress, aggregating and forwarding feedback to complainants, reporting). It may be a new or existing unit or person within an organization. Who is best suited to handle these tasks is sometimes determined by the nature of community grievances. Community liaison or an administrative assistant should serve as an entry point to receive and log complaints. Frequent turnover of staff assigned to grievance handling and community liaison can adversely impact the perception of the mechanism.
- It should be noted that other community engagement tasks do not take the place of handling grievances, particularly if a community liaison officer is also assigned to handle the grievance process.
- Where possible, functions of grievances handling should be separated from project management, and assign clear accountability for each, so as to avoid decisions that favour the interest of the contractor only. Safeguards can include clearly defining the authority and decision-making responsibilities of people involved in administering the grievance mechanism, as well as making sure that senior management is ready to intervene. These would include responsibilities for managing the overall process, as well as separate steps (receipt, recording and tracking, investigating, and responding).

3.3 Involving third parties

Third parties such as non-governmental organisations, community-based organisations, local governments, local community and religious organisations and traditional councils can sometimes be involved in companies' grievance mechanisms. They can serve as process organisers, places to bring a complaint to be passed on to the contractor, or as facilitators, witnesses, advisors, or mediators. In some cases, it may be beneficial to place part of the responsibility for the process on external entities, formed within the communities themselves or acceptable to them while the contractor maintains ultimate responsibility and accountability for the process. Third parties can help increase the level of trust from communities as well as overcome certain limitations of project-level mechanisms, such as lack of transparency, insufficient contractor resources, possible conflict of interest, and biases, provided that they themselves are perceived to be unbiased and impartial relative to both the contractor and the communities. It is recommended that the Local councils and Community Development Committees be the first point of contact.

3.4 Options for third party engagement

To have an effective project-level grievance mechanism, companies need to understand the roles of third parties before engaging them. For example:

Community self-governance structures (such as village councils, tribal councils). These should be taken into account when developing a grievance mechanism to ensure cultural appropriateness, community involvement in decision making, and efficient and effective use of existing community resources.

Local NGOs, CBOs - Identify those that are active in the area of project or company operations, learn about their interactions with the affected communities, determine what contribution they can make to effective resolution, and discuss options for an NGO to administer the project's grievance mechanism or a part thereof. Sometimes NGOs can also represent local communities and help them build their capacity to understand the process and its benefits, participate in decision making, and articulate grievances and bring them to the attention of companies. Such organizations can be viewed as a voice of communities, and companies should be prepared to deal with grievances brought by NGOs on behalf of communities.

Local government authorities. Communities sometimes bring their project-related complaints to local governments. It would be advisable for the contractor to consider partnering with local authorities to facilitate receipt of grievances from communities. Local governments can also be a resource to help companies resolve complaints, since local authorities may have an established relationship with the communities. They can participate as third parties and advisors in contractor-initiated resolution processes.

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Bringing ideas to life

Appendix H – AF Ad Hoc Complaint Handling Mechanism (ACHM)

7 October 2016

Adaptation Fund Board

AD HOC COMPLAINT HANDLING MECHANISM (ACHM)

(APPROVED IN OCTOBER 2016)

Ad Hoc Complaint Handling Mechanism (ACHM)

What is the ACHM?

1. The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities.

2. The Adaptation Fund (Fund) makes the ACHM available to Implementing Entities and members of the communities that are adversely affected by the implementation of project/programmes funded by the Fund. The purpose of the ACHM is to assist in responding to complaints raised against project/programmes funded by the Fund through a participatory approach.

3. Complainants and implementing entities should use the implementing entity's grievance mechanism as a first step. However, the ACHM can be used in cases where the Parties have failed to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year. The ACHM requires a written submission of a complaint by at least one of the Parties.

4. The Adaptation Fund Board secretariat (secretariat) will independently manage all aspects related to complaint handling, under the oversight of the Ethics and Finance Committee (EFC) of the Adaptation Fund Board (Board).[1]

5. The ACHM builds on alternative dispute resolution techniques.[2] Main features of the ACHM are to effectively facilitate dialogue among stakeholders, mediate/assist in resolving issues raised, and develop and share lessons to improve future operations.

How does it function?

6. **Receipt:** Within ***5 business-days*** of receiving a complaint, after determining whether the complaint is not excluded from the process as per below, the Manager of the secretariat informs the Parties of the receipt of the complaint.

7. In the course of information sharing between the Parties, the secretariat ensures that names and other identifiers are redacted if confidentiality is requested.

Assessment and Agreement: The secretariat, based on consultations with the Parties prepares a draft assessment report laying out the concerns and expectations of the Parties within ***20 business-days***. The Parties can provide comments to this report within ***10 business-days***.

8. The secretariat incorporates relevant comments into a public Final Assessment Report, annexing the Parties' comments and the complaint. The secretariat will design and include, in consultation with the Parties and based on their good faith, an agreed upon strategy towards the mutual understanding of the issues (confirming or dispelling complaints) and potential acceptable ways forward in order to reach solutions. The strategy will be based on alternative dispute resolution techniques. The Final Assessment Report is submitted to the EFC, which will make a recommendation for approval by the Board, as per the Fund's risk management framework.

[1] See Adaptation Fund risk management framework, *available at* https://www.adaptation-fund.org/documents-publications/operational-policies-guidelines/.

[2] These include facilitation, mediation, cooperative or interest-based problem-solving, neutral evaluation, joint fact-finding, negotiation, conciliation, arbitration etc.

9. **Non-objection by EFC on the Final Assessment Report:** The secretariat confirms that the agreement of the Parties is included in the Report. The secretariat then promptly circulates this report to the EFC by email and seeks their absence of objection within ***14 business-days***. If the objection is raised, the secretariat informs the Parties that the secretariat will cease all dispute resolution activities with regard to such complaint.

10. In case the non-objection is provided, the secretariat in consultation with the Parties and their participation implements the strategy. Relevant trust building measures or dispute resolution activities can be based on specific issues raised, or grouping of issues, addressing them independently one from the other, or holistically covering all aspects of the complaint.

11. **Implementation and Monitoring:** The ACHM requires trust building measures, and continued good faith engagement. Hence, it cannot be time bound. The secretariat will prepare and submit the update reports on the implementation of the agreed-upon dispute resolution strategy proposed in the Final Assessment Report. The Update Reports are submitted to the EFC. The cost for ACHM activities is covered by the Fund.

12. The ACHM is not a guarantee to achieving resolution. If within two Update Reports the ACHM was not able to implement any activity part of the dispute resolution strategy, the Manager of the Fund's secretariat in consultation with the EFC Chair may decide to suspend or terminate the dispute resolution activities.

13. In case the dispute resolution activities are suspended, the secretariat informs the Parties that the ACHM will temporarily cease with regard to such complaint and the reasons behind the suspension.

14. The Manager of the secretariat in consultation with the Parties revisits the decision to suspend dispute resolution activities on a bi-monthly basis. In doing so, the secretariat seeks the Parties' good faith agreement to reengage. The ACHM resumes such activities if the Manager of the secretariat in consultations with the Parties deems that conditions are met to do so.

15. **Remedy and Incentive:** In case such activities are to be terminated because of the lack of cooperation by any of the Parties, the secretariat may refer the complaint to the EFC, who may recommend to the Board the measures included in the Risk Management Framework.

16. **Resolution:** Once all matters are deemed resolved or dispute resolution activities are terminated, the secretariat issues a Final Resolution Report, making mention of any interim solutions reached in the process.

17. The secretariat will include in the Final Resolution Report a succinct analysis of systemic policy-related aspects that may have led to the complaint or its lack of resolution. Such aspects may include Policy compliance, institutional capacity, environmental and social risk management framework, weakness in supervision, technical expertise, disclosure and consultations, or other relevant aspects.

18. This report is shared with the Parties to provide their comments within ***14 business-days***. The secretariat incorporates any relevant comments in the Final Resolution Report, annexes the Parties' comments, and submits the report to the Board.

Who can complain, can it be confidential?

19. Any individual, or their representative(s), living in an area where impacts of a Fund-supported project may occur, can bring a written complaint forward to the secretariat.

20. If complainants believe that there may be a risk of retaliation for raising their concerns, they can request confidentiality. Confidentiality includes names, addresses, pictures and any other identifying information. This provision also applies to complainants' representatives or any other individual believed to be, at present time or in the future, at risk of retaliation.

21. Confidentiality can be requested at any time and is provided throughout the process. Except the secretariat, no one will have access to confidential information.

How and when to complain?

22. Complaints will be submitted in writing in any UN language.[3] However, when a complaint is not submitted in English and for the purposes of translation, additional time may be required to prepare the draft assessment report referenced in paragraph 8.

23. Contact information to submit a complaint are as follows: 1- by electronic email to afcomplaints@adaptation-fund.org; or 2- by hard copy to Adaptation Fund Board secretariat, 1818 H Street NW, N7-700, Washington, DC 20433, USA.

24. Complaints will indicate names and addresses of the complainants. They will also indicate whether representative(s) are appointed, listing the representative(s) names and addresses.

25. Complaints will include any information relevant to the project (i.e., title, location, sector, description...) including the project activities believed to be the actual or potential source of the harm, the nature of the harm attributed to those activities.

26. Complaints can be sent up to the date of the submission of the final evaluation report of the project concerned.

Exclusions

27. Complaints with any of the following characteristics are excluded from the ACHM:

a) Anonymous complaints (confidential complaints are different and provided for as per above);
b) Frivolous, malicious, or vexatious complaints[4];
c) Complaints from executing entities or their staff against the implementing entity with which they are contracting related to a contract between the executing entity and the implementing entity;
d) Complaints related to activities that have no relevance to the Fund-supported project; or
e) Complaints related to matters already addressed in the context of an earlier complaint and for which a solution was agreed upon, unless this complaint is based on new facts not known at the time of the initial complaint.

[3] The official languages of the UN are Arabic, Chinese, English, French, Russian and Spanish.

[4] The generally accepted meanings of the terms "frivolous, malicious and vexatious" are as follows: (i) frivolous-trivial, trifling or futile, not serious; (ii) malicious-bearing active ill-will or spite, or having wrongful intention toward any other; and (iii) vexatious-causing or tending to cause irritation, frustration or distress, or not having sufficient grounds for action and seeking only to cause annoyance. The factors which may indicate that a complaint is frivolous, malicious or vexatious include the complaint: fails to identify clearly the substance or precise issues which require to be addressed; complains solely about trivial matters to an extent out of proportion to their significance; is part of a "tit for tat" complaint; continually changes, apparently to prolong the engagement with the ACHM; adds no new information from a complaint which has already been addressed by the ACHM; is made by a person who makes excessive contact or unreasonable demands, including abusive behavior and threats.

Disclosure

28. In accordance with Implementing Entities' fiduciary duties to comply with the standard on transparency, anti-corruption measures, and self-investigative authority, the Adaptation Fund will maintain a page on its website, the Accountability Register, relevant to the grievance mechanisms of the Implementing Entities. This page will list each Implementing Entities' grievance mechanisms as well as this ACHM.

29. In the interest of transparency, the Adaptation Fund also dedicates on its Accountability Register a page for each complaint received where all relevant documents are disclosed, including final assessment reports, public notices, update reports, and final resolution reports. This page is cross-linked to the project's page.

30. Implementing Entities are encouraged to link the Adaptation Fund's Accountability Register to their website.

Appendix I – NamWater Grievance Handling

CHAPTER 31

GRIEVANCE HANDLING

1. GENERAL

1.1 All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation.

1.2 Appeals against disciplinary actions will not be dealt with through grievances.

1.3 Employees may lodge grievances without fear of victimisation or harassment.

1.4 Grievances should be resolved as quickly and fairly as possible and at the lowest level possible.

1.5 Aggrieved employees have the right to be assisted by an employee representative who may be a shop steward or a fellow employee.

1.6 Records of grievance hearings will be kept.

1. STEPS IN HANDLING GRIEVANCES

Step 1: Immediate Superior

(i) The employee must in the first instance discuss his/her grievance with the immediate superior**,** or the latter's superior in the event of a grievance against the immediate superior.
(ii) The superior must try to resolve the grievance within five (5**)** working days and inform the aggrieved employee accordingly.
(iii) The aggrieved employee, if not satisfied with the outcome, may appeal to the next higher level.

Step 2: Hearing

(i) The matter is referred to the relevant Manager.
(ii) The employee completes a grievance form with all relevant details. The employee may be assisted by the Industrial Relations Officer. The form is handed to the Divisional Manager.
(iii) The Manager shall hold an inquiry into the grievance which will be attended by the employee concerned, the respondent, the employee's representative, the Industrial Relations Officer and any other person(s) co-opted by the Manager.
(iv) The Manager must pronounce a decision within five (5) working days.
(v) If the aggrieved employee is still not satisfied, he/she may appeal to the General Manager concerned and the Chief Executive Officer whose decision will be final.

3. PROCEDURE FOR A GRIEVANCE THAT INVOLVES MORE THAN ONE EMPLOYEE
If the grievance lodged involves more than one employee, it is recommended that the employees (if more than ten) should select a spokesperson and at least two or three employees to represent the group.

4. ROLE OF AN EMPLOYEE REPRESENTATIVE

4.1 With a view to ensuring that grievances are dealt with efficiently, an employee representative is encouraged to be familiar with the relevant information (which will vary depending on the nature of the dispute) pertaining to the employee and the grievance, such as:

4.1.1 Conditions of employment and NamWater rules;

4.1.2 Knowledge of the work performed by the employee ;

4.1.3 Labour/employment legislation;

4.2 The representative is encouraged to -

4.2.1 Ensure that the employee expresses his/her grievance freely and openly;

4.2.2 investigate and clarify the grievance;

4.2.3 be able to distinguish fact(s) from opinion(s);

4.2.4 note the relevant facts;

4.2.5 establish what outcome is desired;

4.2.6 verify facts (third parties, knowledge, work performed, NamWater rules, regulations, conditions, line of authority, etc.)

4.2.7 decide whether the grievance is valid and advise the employee accordingly.

ROLE OF THE SUPERVISOR / MANAGER

The supervisor and/or Manager of a grievance meeting should –

4.3 listen and encourage the employee to express his / her grievance freely and openly;

4.4 clarify and investigate the grievance;

4.5 focus on the grievance not the employee's personality;

4.6 distinguish fact from opinion;

4.7 note the relevant facts;

4.8 establish what settlement is desired;

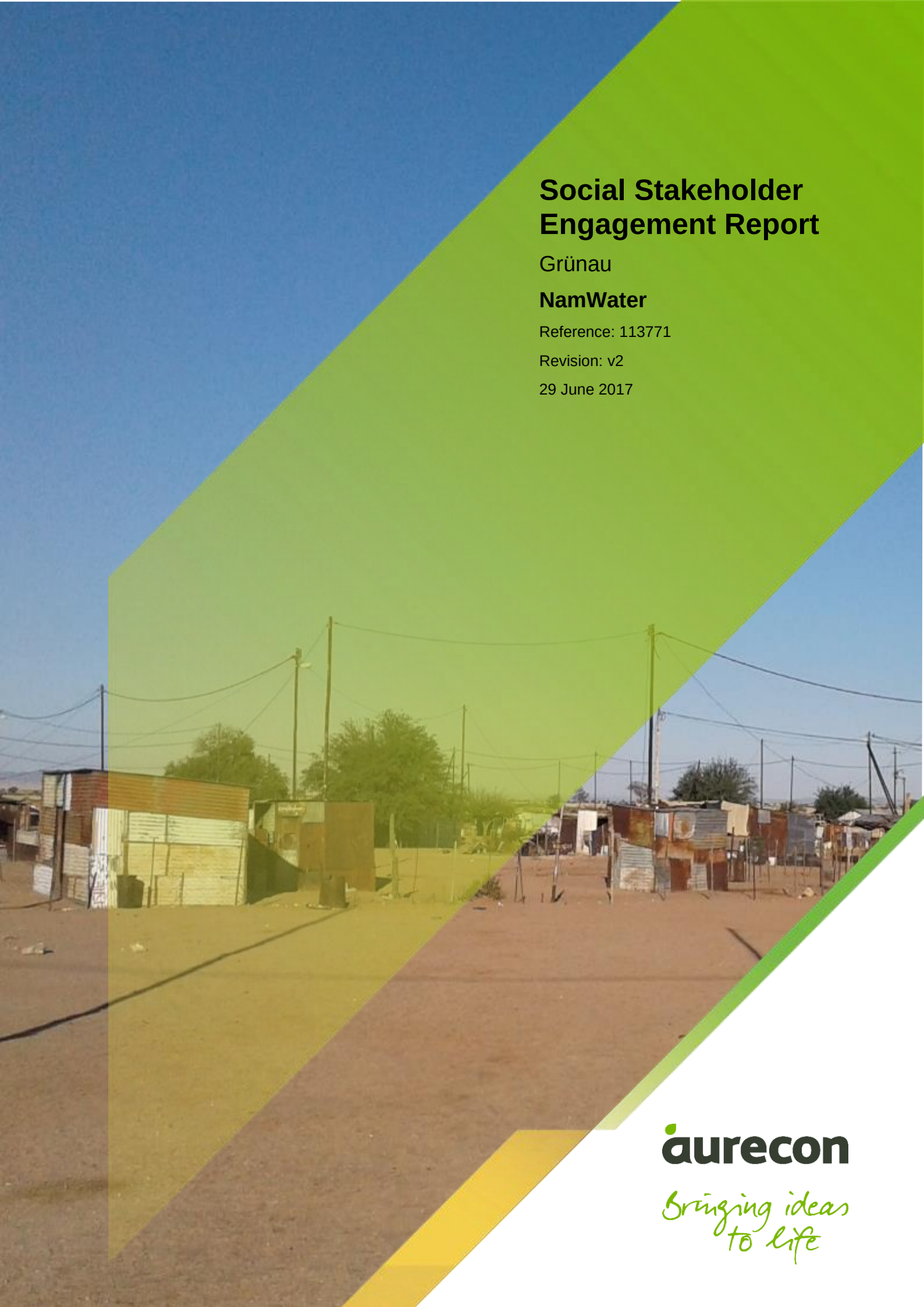
4.9 verify facts (third parties, knowledge, work performed, NamWater rules, regulations, conditions, line of authority, etc.);

4.10 obtain assistance from senior or human resources management if necessary.

5. DISPUTES/UNRESOLVED GRIEVANCES

If the grievance is not resolved internally then the employee(s) who lodged the grievance may pursue any remedies which may be available to them in terms of the Labour Act or any other applicable legislation.

Annexure 5: Social stakeholder engagement report: Grünau



Social Stakeholder Engagement Report

Grünau

NamWater

Reference: 113771

Revision: v2

29 June 2017

aurecon

Bringing ideas to life

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Abbreviations

ACHM	Ad Hoc Complaint Handling Mechanism
BID	Background Information Documents
CBO	Community Based Organisation
CDC	Community Development Committee
CEO	Chief Executive Officer
CMHC	Counselling and Mental Health Centre
DRFN	Desert Research Foundation of Namibia
EE	Executing Entity
ESIA	Environmental, social, and gender assessment
ESMP	Environmental and social management plans
ESMS	Environmental and Social Management System
HIV/ AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HR	Human resources
IFC	International Finance Corporation
IPPR	Institute for Public Policy Research
NamWater	Namibia Water Corporation Ltd
NCPE	National Commission for the Promotion of Equality
NIE	National Implementing Entity
NGO	Non-governmental organisation
PFG	Project Formulation Grant
STI's	Sexually transmitted diseases
TB	Tuberculosis
UNDP	United Nations Development Programme

1 Introduction

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes. A successful demonstration of the methods will enable further roll-out to other sites in the country.

The Namibia Water Corporation Ltd as an Executing Entity (EE) in collaboration with the Desert Research Foundation of Namibia (DRFN) as an National Implementing Entity (NIE), applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology. In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through screening process
2) Environmental, social, and gender assessment (ESIA) – only risk identification at this stage
3) Environmental and social management plans (ESMP)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – data gathering
5) Stakeholder disclosure and consultation (stakeholder engagement)
6) Grievance mechanism developed

This documents refers to the stakeholder engagement process related to the six (6) steps as outlined in the Environmental and Social Management System (ESMS) manual. The outcomes of the stakeholder engagement from this study will be used to inform the reports generated for the above-mentioned steps.

The baseline social conditions of a community are the existing conditions and past trends associated with the human environment and their area of influence in which the proposed activity is to take place. Assessing proposed developments in a socio-economic context will help both the developer and affected community to identify potential social equity issues, evaluate the adequacy of social services and determine whether the project may adversely affect overall social well-being. Focus group discussions assist in identifying these social conditions and the socio-economic context of the proposed project.

A focus group discussion is a guided discussion involving a small number of people (between 5 and 20) sharing a common characteristic (e.g. belonging to the same socio-professional group, etc.). These discussions will address socio-economic topics relating to socio-economic impacts based on projects and initiatives of common interest to stakeholders, and issues raised during discussion will be recorded

and subject to qualitative analysis. Data from these discussions will assist in updating socio-demographic information, as well as allowing a forum for community initiatives to be discussed with relation to socio-economic impacts.

Through the focus groups relatively dependable data can be gathered within a short time frame. Effective consultation and engagement is a vehicle that will be used to build more resilient relationships with affected stakeholders and communities. It will lead to the identification of perceived social impacts that the proposed project may have on these communities as well as possible mitigation measures, which will inform the overall study.

2 Methodology

1.1 Planning and preparation

1.1.1 Stakeholder identification

The first step is to identify stakeholders i.e. determining who the project stakeholders are as well as their key groupings and sub-groupings. Careful identification of local peoples' representatives is an essential part of preparation for the consultation process. When selecting representatives, it may be useful to consider the following:

- Who are the elected officials of the territorial jurisdictions impacted by the project or measure? To what extent do these authorities adequately represent local peoples?
- Who are the traditional leaders of the local peoples?
- Given that local communities are not necessarily homogenous, are there groups, such as women, youth, and agricultural, who are not represented by either of the above?
- Are parallel communications needed for these groups?

The following council representatives have been identified and will participate in the focus group sessions: Bethanie Village Council, Grünau Village Council and Epukiro Post 3 Village Council.

1.1.2 Choosing dates and venues

It will be important to choose a venue where stakeholders feel more comfortable - most likely at a location within the community as this tend to have more productive engagement processes, for the following reasons:

- It lends **transparency** to the process. Community members can witness the process and stay informed about what is being discussed on their behalf, and what has been agreed at the close of consultation or negotiations.
- It increases **accountability** of local leaders. Community members will know what they are entitled to demand, and they will be able to monitor its delivery and avoid corruption.
- It sends the **message that the input of communities** are valued enough to travel there and spend time with them

- It contributes to community members' feeling of **ownership over the engagement process**. Community members say that the opportunity to have input into stakeholder meetings gives them a sense of having a role in the outcome of decisions.
- Finally, it allows community members to **identify their own representatives**, preventing illegitimate representatives from claiming that they speak for communities.

1.1.3 Stakeholder notification

Stakeholders identified and included in the stakeholder database were notified of the relevant meetings either by formal letters, email, posters and phone.

The meetings were held as follow:

Monday, 12 June 2017 at;

- Grünau Town Council Hall @ 14H00 – Authorities such as Councillors, Headmen, Traditional Leaders

Tuesday, 13 June 2017 at;

- Grünau School Hall @ 08H30 – Local businesses, entrepreneurs, local community such as, families, men, woman, children, schools, hospitals, churches and any others.

1.1.4 Focus group materials

It is not only important to choose a venue where stakeholders feel comfortable at but also to use appropriate level and type of meeting materials that the participants will understand and feel comfortable with and that will allow for maximum participation.

When deciding on which materials to use during focus group meetings the following must be taken into account: audience, venue, equipment available, timeframe and desired outcomes.

To ensure the focus group sessions had maximum participation and provide best results, the following meeting materials were used: digital presentation providing project information and mapping the site and surrounding areas as well as Background Information Documents.

1.2 Outline of focus group meetings

The focus group session will be structured sessions facilitated by a social scientist. Aurecon will prepare the attendance register, background information as well as facilitate the focus group meetings and record the meetings and issue meeting records.

The following draft agenda for meeting with Councillors etc. were used for the focus group meetings.

Topic	Speaker
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater
Perception activity Current water situation and attitude towards project	Aurecon
Discussion session Perceived positive and negative project impacts (construction and operational phase)	Aurecon
Information gathering Vulnerable and disadvantaged groups: Community structures and protocols	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/ Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials were utilised as well as the envisaged outcome.

- **Project introduction**

  Facilitation method: project overview and discussion session.

  Materials: maps and handouts with information (background information) regarding the project.

  Outcome: to inform stakeholders about the project.

- **Perception activity**

  Facilitation method: initiating discussion over project perception

  Meeting materials: cards

  Outcome: to obtain general knowledge and attitude towards the project

- **Discussion session – current issues as well as perceived project impacts (construction & operational phase)**

  Facilitation method: discussion session

  Materials: flip chart and pens

  Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

- **Discussion session – vulnerable and disadvantaged groups**

  Facilitation method: discussion session

  Materials: flipchart and pens

  Outcome: to identify / name vulnerable and disadvantaged groups. To identify perceived impacts of project on groups as well as recommendations on how to include these groups as

well as how these groups can benefit from project. For this project, it will be very useful to compile socio-economic information and to collect socio-economic data in advance to ensure that the stakeholder engagement activities are culturally appropriate from the outset, and that the groups most vulnerable or potentially disadvantaged by the proposed project are identified early on.

- **Community structures and protocol**

  Facilitation method: information gathering

  Meeting materials: flipchart and pens

  Outcome: obtain names and contact details of current organisations and structures in communities (will assist with the next phases of the project). Identify protocol for dissemination of information as well as protocol to deal with grievances (current structure in communities as well as recommended for project.

- **Way forward**

  Closing date: 20 June to provide any comments and information.

  Meeting materials: BIDs to distribute.

Figure 1: Councillor meeting

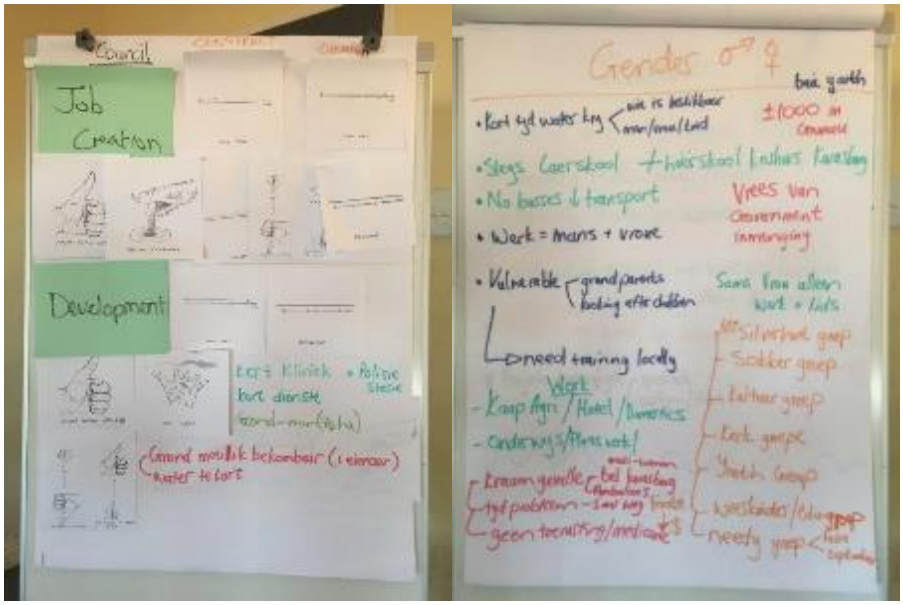

Figure 2: Councillor meeting notes

The following draft agenda for meeting with other stakeholders. were used for the focus group meetings.

Topic	Speaker
Opening and welcome	Local representative
Purpose of the gathering	Aurecon
Introduction and project overview	NamWater
Story telling Current water situation: risks and impacts (positive and negative): gender, vulnerability etc.	Aurecon
Discussion session Perceived positive and negative project impacts (construction and operational phase)	Aurecon
Information gathering Environmental and social survey	Aurecon
Way forward	Aurecon
Vote of thanks and closure	NamWater/ Local representative

Below is a breakdown of the workshop format, describing which facilitation method and materials were utilised as well as the envisaged outcome.

- **Project introduction**

  Facilitation method: project overview and discussion session.

  Materials: maps and handouts with information (background information) regarding the project.

  Outcome: to obtain general knowledge and attitude towards the project as well as any perceived risks or hazards.

- **Story telling**

  Facilitation method: discussion over current water situation - risks and impacts (positive and negative): gender, vulnerability etc.

  Meeting materials: flipchart and pens

  Outcome: To obtain information regarding the current water situation in the area: water availability, water quality, health risks, impacts etc.

- **Discussion session – perceived project impacts (construction & operational phase)**

  Facilitation method: discussion session

  Materials: flip chart, category cards, prestik and pens

  Outcome: to identify perceived potential impacts (positive and negative) as well as recommended enhancement measures for perceived positive impacts and recommended mitigation measures for perceived negative impacts.

- **Information gathering – environmental and social survey**

  Facilitation method: information gathering

  Meeting materials: survey, pens and clipboards

  Outcome: obtain current water situation as well as personal views, risks and issues regarding the proposed project.

- **Way forward**

  Closing date: 20 June provide any comments and information.

Figure 3: Grünau stakeholder meeting

Note: due to time constraints, additional efforts to invite community members were difficult. This will be more adequately addressed with 2 more PPP in the EIA phase. Overall perception is however of Namibian communities that they are very reluctance in attending meetings

3 Setting the scene

Grünau is situated in the ǁKaras Region and in the Karas Constituency in southern Namibia and, as seen in in Figure 4 below. Grünau is situated 130 km from the Noordoewer border on the major route to and from South Africa and 90km from the Fish River Canyon and Ai-Ais Hot Springs is only 110km from Grünau. Karasburg is 50km South East of Grünau.

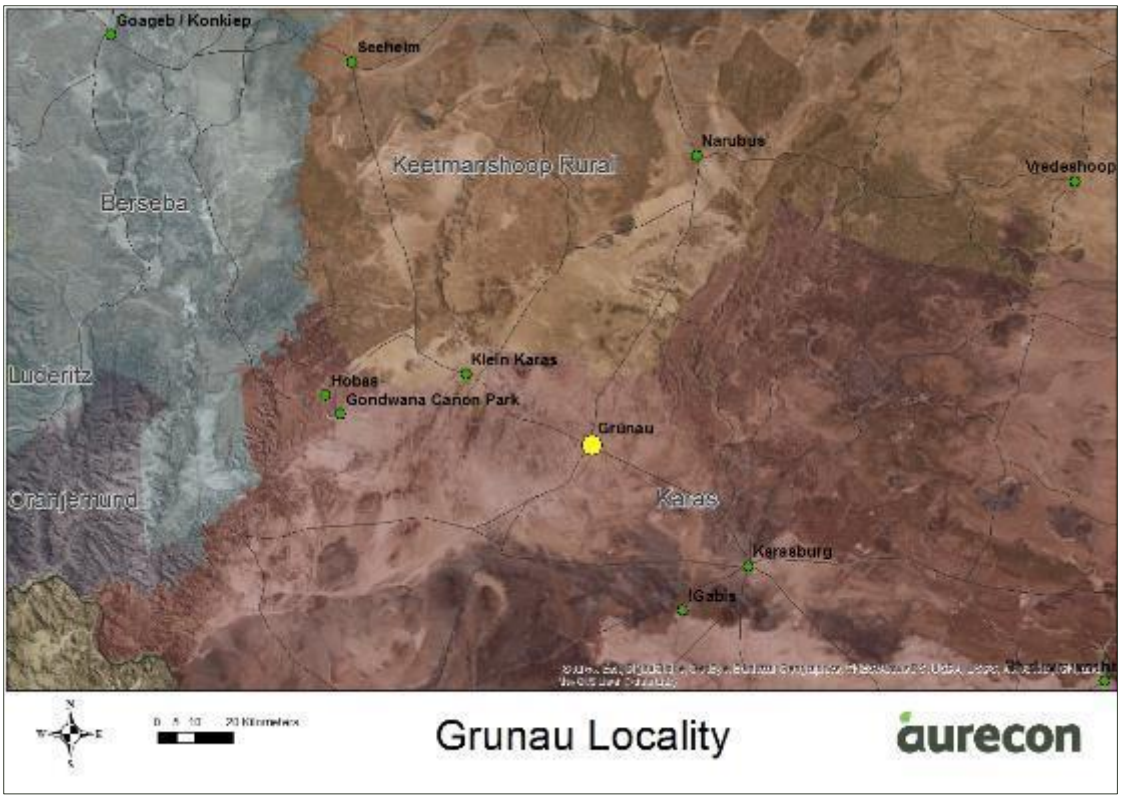

Figure 4: Gruanu Locality

3.1 Social baseline

The aim of this section is to contextualise the study by developing a socio-demographic profile that captures the relevant characteristics of the affected region. It will also assist in setting the scene in regards with gender and vulnerable groups' risks.

3.1.1 Key socio-economic statistics

Table 1: Key socio-economic statistics

Below is a summary of the population statistics for the ǁKaras Region in which Grünau is situated.

	2011	2001
Population Size		
Total	77 421	69 329
Females	38 014	32 346
Males	39 407	36 976
Annual growth rate (%)	1.1	1.1
Percent in Urban/Rural areas		
Urban	54	54
Rural	46	46
Sex ratio: Males per 100 females	104	114
Population density		
People per sq. km.	0.5	0.4
Age composition, %		
Under 5 years	11	11
5 – 14 years	19	20
15 – 59 years	63	63

60+ years	6	6
Marital status: 15+ years, %		
Never married	59	69
Married with certificate	27	20
Married traditionally	3	2
Married consensually	7	5
Divorced / Separated	1	1
Widowed	3	2
Citizenship, %		
Namibian	97	96
Non---Namibian	1	3
Main language spoken at home, Percent of households		
Afrikaans	36	40
Oshiwambo	27	23
Nama/Damara	23	26
Head of households		
Females	44	49
Males	56	51
Literacy rate, 15+ years, %	97	87
Education, 15+ years, %		
Never attended school	6	7
Currently at school	9	7
Left school	84	77
Labour force, 15+ years, %		
In labour force	75	67
Employed	68	71
Unemployed	32	29
Outside labour force	19	24
Student	39	28
Homemaker	15	40
Retired, too old, etc.	35	32
Housing conditions, %.		
Households with		
Safe water	92	94
No toilet facility	23	26
Electricity for lighting	67	50
Wood / charcoal for cooking	28	35
Main source of income, %		
Household main income		
Farming	5	7
Wages & salaries	72	69
Cash remittance	5	6
Business, non-farming	5	5
Pension	11	10
Fertility		
Average number of children per woman	3.1	3.1
Disability		
With disability	4	3

Source: Namibia 2011 Population and Housing Census Main Report

3.2 Current water situation

Water is life. For millions for years' life on earth has been dependant on water for survival. The amount of water on earth is constant and cannot be increased or decreased, but it is unevenly distributed across the earth.[1] According to the IPPR, Namibia is facing a creeping yet increasingly precarious situation of freshwater scarcity, and the UNDP states that Namibia is the driest country in sub- Saharan Africa receives a pitiful 270 millimetres of downpour per year on average. Of this 83 percent evaporates as soon as it hits the ground. Climatologists predict temperatures in the country will rise with 1 to 6 degree in the next several decades, while rainfall could drop another 200 millimetres. Already, in the past few years, rains have been erratic leading to alternating heavy floods and dry spells. The consequences are devastating for a country where 70 percent of the people to some extent depend on agriculture.

Figure 5: Water tank at Grünau

The current water situation in Grünau is exactly this strained. The water source for Grünau is stressed as the combined yield of the current six boreholes is not enough to cope with the demand. Water is available 1.5 hours of the day and if no member of the household is home or in the area at the time, then the household does not have any water available for that day.

Currently the formal part of the Grünau settlement has taps in their yards and the informal part of the settlement has communal standpipes. The main water tank is a couple of 100 metres from the settlement. Future development of the scheme consisting on the installation and connection of four additional boreholes that will allow to meet the actual demand.

[1] http://www.waterwise.co.za/site/water/environment/situation.html

It was stated by a farmer, the groundwater is very deep as far as 300 m and the source is very week and in the past 5 years the availability of water has depleted.

In Grünau raw water is abstracted mainly from six available boreholes. Water abstracted from four of those boreholes have currently high fluoride contents, more than 2 mg/l, corresponding to class B and class C water. While water from the other two boreholes have fluoride content lower than 2 mg/l.

The water thus needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards. A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

3.3 Gender and community aspects

In rural areas, such as Grünau, women equally share involvement in the workforce. This is further promoted by the Namibian National Gender Policy 2010 – 2020. To address gender issues and empower women, during the lifespan of the project the project team must mutually share the decision-making with various levels of government, community groups, key stakeholders and members of the public, especially women. The discussion with the community at different stages would attempt to bring to the fore the role of women, specific challenges faced by them, requirement to develop their adaptive capacities, focus on women headed household and their challenges. The project aims to build on the inherent social characteristics of the region and address any gender equity issues during project implementation, if any.[2] The community would feel empowered and take ownership of the project's advantages and its risks. Empowerment is selected when the community and stakeholders are provided with the skills, information, authority and resources in order to make the final decision. Individuals and stakeholders must have capacity to understand risk and accept responsibility and implement initiatives.

4 Meeting outcomes

4.1 Stakeholder profile

[2] Building Adaptive Capacities of Communities, Livelihoods and Ecological Security in the Kanha-Pench Corridor of Madhya Pradesh. India.

Figure 6: Stakeholder engagement meeting

The profile of the delegates who attended the stakeholder engagement meetings is as follows:

Age: of the 48 delegates that attended the meeting 26 were female and 22 were male.

Age range: the majority of the delegates were between the age of 20 and 29 (36%). See below Figure 7 below for age profile breakdown.

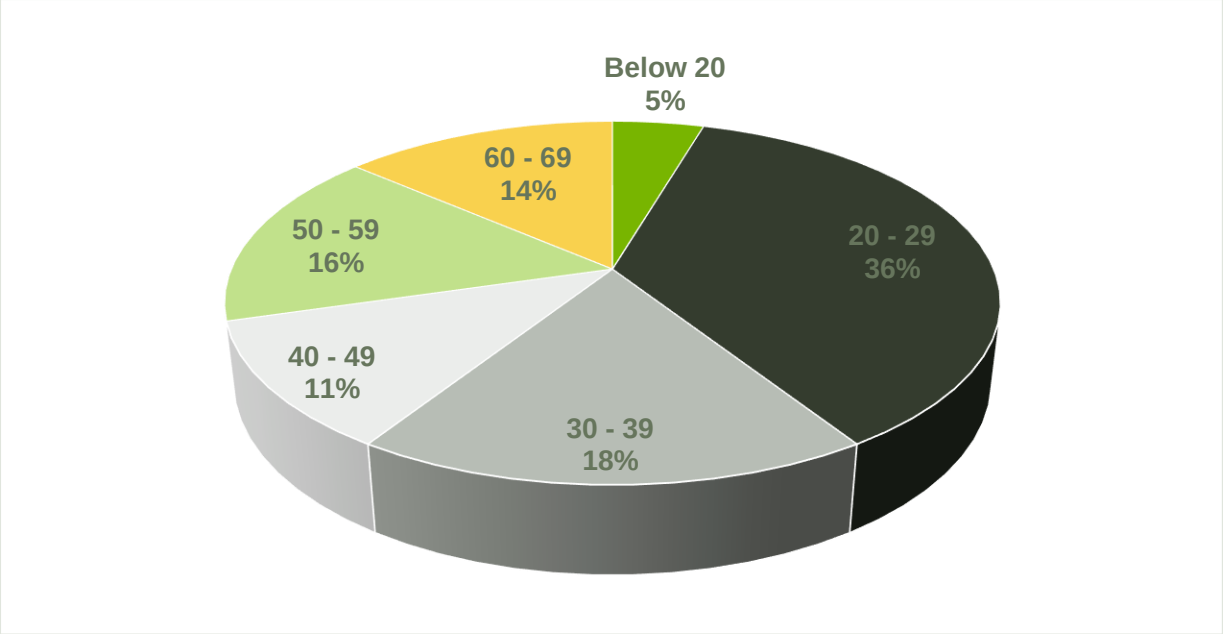

Figure 7: Delegates age profile

Table 2 below is a breakdown of the classification of the stakeholder engagement delegates.

Table 2: Delegates classification

Position / interest / classification
Auto mechanic
Community member
Health assistant worker
Hostel co-worker
Hostel matron
Kindergarten teacher
Farm manager
Post office clerk
Pensioner
SAO
SDC Member
Unemployed

4.2 Impacts of current water situation on local community

The current population in Grünau is estimated at 1,000 persons. The substandard quality water has certain negative impacts on the local community. Some of the impacts mentioned by the Grünau community includes:

- Health impacts;
    - Bad taste,

    - Brown teeth,
    - Gastrointestinal disturbance, and
    - Headaches.
- Economic impacts;
    - Medical and dental expenses, and
    - Expensive water and food.
- Impacts on development and investment opportunities.
- Other impacts.

4.2.1 Health impacts

The community of Grünau indicated that the water supplied to the people tastes bad and this has an impact on the amount of water people drank, which in turn has an impact on the general health of the community. One of the biggest impacts that the lack of water and the fluoride in the water have on the people of Grünau, is that it causes their teeth to be yellow and brittle. It not only has an economic impact but also a far-reaching impact on the self-esteem of people especially on the youth and women of the community. According to the Counselling and Mental Health Centre (CMHC), low self-esteem can create anxiety, stress, loneliness, and increased likelihood of depression, and can have consequences such as:

- cause problems with friendships and romantic relationships;
- seriously impair academic and job performance; and
- can lead to increased vulnerability to drug and alcohol abuse

Worst of all, these negative consequences themselves reinforce the negative self-image and can take a person into a downward spiral of lower and lower self-esteem and increasingly unproductive or even actively self-destructive behaviour.

Other health impacts that the current water quality have on the local community and more so on visitors to Grünau is gastrointestinal disturbances. The local community has built up a little bit of a resistance to the water quality, but prolonged exposure to the high fluoride content in the water does impact on the gastrointestinal health of the community. Visitors to the area are discouraged to drink water from the taps in order to prevent gastrointestinal disturbances. Headaches are also caused by the lack of water consumption and the consumption of water with a high fluoride content. The amount of water has a big impact on the general health of the people as it is difficult to practise good hygiene.

4.2.2 Economic impacts

Because of the health impacts associated with the inadequate amount and substandard water quality, more money is spent on health services such as dental and medical services. The local community indicated that a lot of the people living in Grünau are unemployed and do not have the necessary funds for such services as it is not only the appointment and medicinal fees but also transport fees that is part of such a health visit.

The meeting attendees indicated that the amount paid (N$ 13.20/m³) for the substandard water is high for the community. This they feel puts more pressure on the already strained financial situation of the local community. Another economic impact stated is that the water is also not suitable for growing crops, especially vegetables, and the people of Grünau must import their vegetables and fruit from other regions at a higher price.

Another financial burden placed on the community as a result of the high fluoride content in the water is the impact the water has on household appliances. The people indicated that their kettles and irons and other appliances that use water does not last very long and must be replaced regularly. This is very costly and increases the financial stress on households.

4.2.3 Impacts on development and investment opportunities

There are two issues that the community feel hampers development in Grünau, one is the lack of land available and the other is the lack of and substandard quality of water. The lack of water and the substandard quality water is deterring development and investment to come to Grünau and therefore hampering economic development and progress. The community feels that once investors realize that the water quality in Grünau is bad they move to another area where the water quality is better.

4.2.4 Other impacts

The lack of water has far reaching impacts on the settlement of Grünau. The community indicated that without water they could not assist a family whose house burned down. The school does not have sufficient water for the learners and this has a negative impact on the health of the leaners and their ability to perform.

4.3 Questions and other comments from community

This section lists the questions and comments received from the community during the stakeholder engagement sessions.

Questions:

- Will the price of water go up?
- Will the project also treat the water from the Council's borehole?
- What will happen with the brine?
- Can the brine be used for agriculture?
- Will the project provide employment for the local community?
- Will the project provide skills transfer, upliftment and training opportunities to the community?
- Will the project provide a more constant water supply?
- Will NamWater provide a water tank closer to the settlement?
- Will the project also be able to supply back-up power for the settlement?

Comments:

- The project must put in place measures to make sure the plant is secured and protected against vandalism.
- The community is in favour of this project and welcome any project that will improve their lives.
- They hope that the project will open the door to other projects and investment opportunities in the settlement.
- The hope is there that the project will bring relief and upliftment to the settlement, such as reliable water supply, flush toilets, and other opportunities.

4.4 Survey results

The stakeholder engagement delegates completed a short survey in order to assist with the project proponent in assessing the current water situation in Bethanie. ***However, it should be noted that the survey results illustrated below is not necessarily a true representation of the whole community of Grünau, especially in the fields of gender, age and employment status.***

42 delegates completed the short water survey, the below section illustrates the results.

Gender

Table 3: Gender breakdown

Gender	Number
Female	25
Male	17

Disability status

Only one delegate indicated that he is disabled.

Age

Table 4: Age breakdown'

Age range	Number
Below 20	2
20 – 29	15
30 – 39	5
40 – 49	5
50 - 59	6
60 - 69	5

Employment status

Table 5: Employment status

Employment status	Number
Unemployed	28
Employed	14

Water source

Table 6: Water source

Water source	Number
Local Authority	3
NamWater	37
Other	1

Distance from water source

Table 7: Distance from water source

Distance from water source	Number
Tap in yard	31
+- 100m	2
+- 1km	3
+- 5km	6

Water expense

Al the delegates indicated that they pay for their water and all delegates except three indicated that they feel that water is expensive.

Table 8: Water expense per month

Water expense per month	Number
N$ 0 - 49	6
N$ 50 - 99	22
N$ 100 - 199	3
N$ 200 - 300	2
N$ 400 - 600	7
N$ 1000 - 1500	2

Water quality

Table 9: Water quality

Classification	Number
Very poor	12
Poor	13
Acceptable	14
Good	1
Very good	2

What impact / influence does the quality and availability of water have on your life? E.g. Health and safety impacts, financial, gender vulnerability, etc.

The comments received from the delegates include the following:

Table 10: Comments from stakeholders

She wants her own tank for water storage, she wants to start a small vegetable patch
The use of water is acceptable
Poor water quality and have negative impact on their health
Sometimes the water gives diarrhoea to the kids
Health, Sometimes diarrhoea
Coming back to Grünau after being away, gives diarrhoea especially to the children.
Sometimes it gives diarrhoea
Chlorine index to high
Quality of water has thus far no negative impact on his life. Water is very expensive. Needs more water to wash clothes, water trees. food and hygiene.
The quality of water seems to be acceptable, but community doesn't know whether the water is good to their health. They don't know which water purification chemicals harmless to human health.
Sometimes the water gives diarrhoea
Unemployment
Pit toilets.??
The availability of water for few hours per day impact household negatively. The proposed project will help community to have access of running water throughout the day.
Chlorine in water is too high, needs to replace kettles and pans 3 -5 times a year, needs to carry water to toilets. Sometimes the water gives more diarrhoea because of higher chlorine index
Only water for one hour, pit toilets, health
Water is only turned on for an hour per day. Needs to accumulate water for following days
Gives diarrhoea, but he says he has adapted. The kettle needs replacement every 3 months because of chlorine residue.
Water in town Impacts their skin negatively (Dark skin) 2). Cause diarrheal to children. 3). Brown Teeth. 4). Decreased ability to taste certain types of foods
Cannot sustain a garden; Pit toilets
1). The availability of water for few hours per day impact household negatively. 2). Impacts their health because people don't wash their hands and food properly. 3). Community members consume contaminated water
Prepaid water negatively impact household finances on daily water use and on laundry
Water is not adequate for washing, water differs from enamouring water
Health and Financial
Poor water quality caused by community members

Health because of 'brak water'. Affects are seen mostly in childen, causes diarrhea. No immediate doctor, needs to travel to Karasburg. Unemployment
Appliances and Health
The unavailability of water forces community to use the same water repeatedly for 4-5 days from one container which could be contaminated
Too much chloride harmful to teeth; Negatively impacts financially caused by high chloride which damage electrical appliances and must be replaced every second month of purchase. Household should own water tank which is expensive and is hazardous to fetch water outside at night. Households don't know level of health impact causes by chloride.
She thinks that more water usages could lead to more opportunities (like a garden)
Health, only one hour of water, pit toilet
Needs to replace kettles. they have a flush toilet, but they still need to carry water into the house. They do not have tanks.
Health risk, diarrhoea, water is expensive, no toilets at house
Water holds a major risk towards her health, causes diarrhoea and give brown teeth, financial pressure because of unemployment
Health risk, chlorine residue in kettles, no water for toilets, diarrhoea or vomit because of higher chlorine index
Scarce water in area force household to use water repeatedly for 4-5 days from one container which could be contaminated
Water causes diarrhoea, unemployment, financial, pit toilets - wants flush toilets please

4.5 Grievance procedure

4.5.1 Local community

The grievance procedure currently utilised by the Grünau community is that the grievances go through the Local Village Council (Settlement Office) and the Community Development Committee (CDC). The CDC is made up of representatives from:

- The Local Council;
- Churches;
    - Grünau Church
- Schools;
    - Schools including: Geduld Primary School and Grünau Kindergarten.
- Health structures;
    - Health structures such as: the local health workers.
- NamWater;
- NamPower;
- Elders;
- Women
- Youth;
- Agricultural groups;
- Other groups; and
- Business owners.

The CDC is not as active as it could be and it is recommended that this committee be revived and revised to be able to be the contact point between the project and the local community, and handle all grievances. The community indicated that this is the way they would prefer grievances to be handled. They also stipulated that dates must be set for CDC meetings so that continuous communication between the project and the community can be a reality.

4.5.2 Grievance redress process

Although a company generally differentiates between the actions of its own employees and those of contractors and subcontractors, local communities tend to see no difference and will attribute actions of contractors and subcontractors to the company. This is the case even if contractors are in the country only for a short period of time.

Companies need to anticipate grievances that may arise from the actions of suppliers or contractors, and implement a policy and management tools, such as regular monitoring to govern their behavior and actions, including provisions for coordinated management of grievances and key indicators that help evaluate the effectiveness of contractors' policies and tools. Where there are a small number of contractors, it may be feasible for the contractors to establish and manage their own grievance mechanisms. Companies will need to make sure that these mechanisms do not conflict with the company mechanism or those of the other contractors by establishing clear guidelines and ensuring oversight. Where contractual relationships are more complex or numerous, companies may wish to have all grievances directed to the company's mechanism, regardless of whether they relate to the company or its contractors or subcontractors.

Handling grievances encompasses a step-by-step process as well as assigned responsibilities for their proper completion. Figure 8 below provides **procedure on how grievance** should be received, registered and tracked. Contractors establishing grievance mechanisms will follow the process steps discussed in this section.

Please also see Grievance Mechanism Report for further detail in Appendix G.

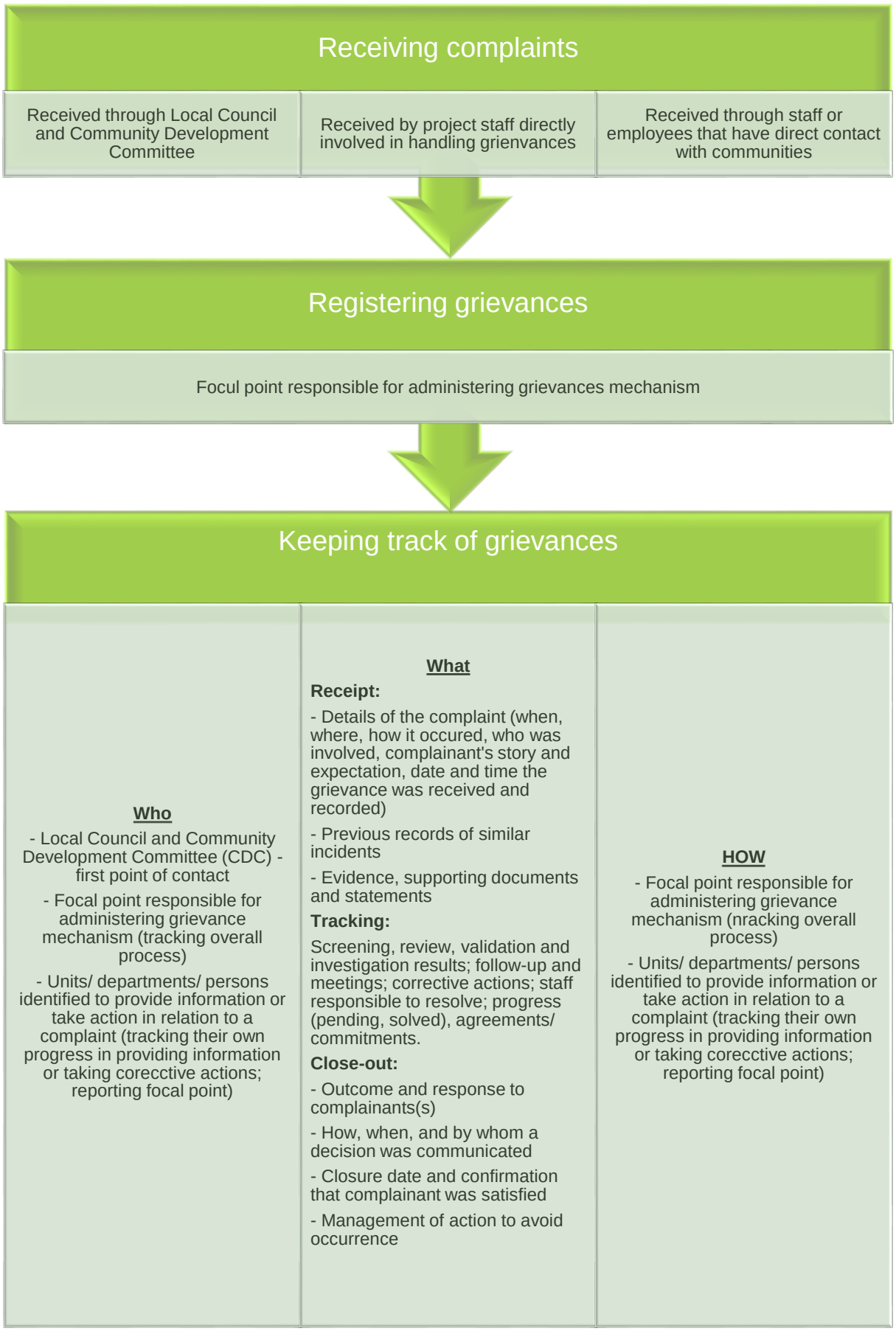

Figure 8: Grievance redress process

2.2 National implementing entity (NIE) - DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities. Please see the Ad Hoc Complaint Handling Mechanism (ACHM) as approved in October 2016 in Appendix H.

2.3 Executing entity (EE) - NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)
- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments.

- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation. Please see the NamWater Grievance Handling in Appendix I.

5 Social risks to project

Social risks arise from the dissatisfaction and grievances of external community and non-governmental stakeholders. Failure to manage these issues can have enormous economic costs, significantly damage the reputations of organisations involved and even put entire investments at risk. Some of the common social risks that can impact on project outcomes are summarised in the list below:

- Risk of sudden population growth and an increased demand for water because of new development such as for e.g. new mine, industry, road route etc.
- Poor community participation.
- Safety and security risks.
- Risk of plant failures, down times and project delays or abandonment.
- Risk of change in law.
- Risk of women being excluded from decision making and project sustainability due to culture or project management structure.
- Reputational damage.
- Lack of user acceptance.
- Decreased operational revenues.
- Consumer boycotts.
- Major modifications due to stakeholder pressure.
- Exposure to legal action.

It is critical however that project stakeholders are not just seen as a source of negative risk to projects. Establishing good relationships with stakeholders and focusing on their concerns can generate significant positive opportunities for the project and proponent.[3]

6 Potential positive and negative project impacts

Potential negative socio-economic impacts include the following:

[3] http://www.engineersagainstpoverty.org/documentdownload.axd?documentresourceid=21

- A **temporary loss of land and assets** to the road servitude or areas to be occupied by project-related surface infrastructure;
- A **population influx** (due to the presence of a construction workforce, as well as an influx of job-seekers into the area), with a possible concomitant increase in social pathologies and increased pressure on existing infrastructure and services;
- **Disruption of access routes and daily movement patterns** by the construction. Blocking of traditional travel paths (people/animals).
- **Displacement.** Permanent loss of life-long social and emotional investment as well as livelihood resources for the households that need to be relocated.
- **Impacts on sense of place**. Such impacts may arise as a result of the visual intrusion of project-related infrastructure, as well as noise and traffic impacts during construction
- **Dust** caused by the construction works and from movement of heavy equipment. During the construction phase, the local community and construction workers would be inconvenienced by the dust generated by the construction works.
- **Noise and vibration** due to the construction works and from movement of heavy equipment. Movement of heavy machinery on existing local roads may be one of the core problems for the local community during the construction phase.
- **Socio-cultural differences and conflicts** between migrant workers and the local community. Single men predominately occupy the construction camps which could create social conflicts, usually as a result of cultural differences, alcohol abuse or being away from their wives or partners for extended periods of time. A possible reason for conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local community. An influx of unemployed job seekers could also add to the potential for conflict.
- Various **social pathologies**, such as drug/ alcohol misuse, abuse of woman and 2children and incidences of sexually transmitted diseases (STI's) may increase with the influx of job-seekers into the area. Crime is another social pathology that may increase. An inflow of construction workers and job seekers may also be accompanied by an increase in crime. Even if specific instances of crime are not as a result of the newcomers, they may still be ascribed to them by local communities.
- **Informal settlements**. Once construction is concluded and the camp is vacated, it may be illegally occupied.
- The need to **secure accommodation for construction** staff.
- **Gender impacts**. Structural gender inequalities embedded in our society - unequal access to and control over material and non-material resources, assets and opportunities.

Positive socio-economic impacts include the following:

- **Local employment and job opportunities**. The construction phase of the project will have a positive impact on the local labour market. A positive impact on continued permanent

employment will be probable due to the proposed project as the long-term economic viability of the mine will be possible, following the mine expansion.

- **Local economy opportunities and economic empowerment**. The construction phase of the project will have temporary positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project.
- **Local economic growth**. The project will stimulate local economic growth with provision of better quality water.
- **Improved health**. The project will provide the local community with better quality water and this will have a positive impact on the health of the people.
- **Training and skills transfer**. The project will provide the opportunity for the local community to participate in training and skills transfer activities.

7 Proposed mitigation measures

The following preliminary mitigation and enhancement measure have been identified:

Population influx:

- The recruitment policy used to employ people on the project must be fair and transparent.
- The intention of giving preferential employment to locals is clearly communicated, to discourage an influx of job-seekers from other areas.
- Inform local businesses about the expected influx of construction workers so that they could plan for extra demand.
- Ensure that employment procedures/ policy of the contractor is communicated to local stakeholders, local farmers and Local Ward Councillor.
- Have clear rules and regulations for access to the construction site to control loitering.
- Consult with the local private security companies and Police to establish standard operating procedures for the control and removal of loiterers at the construction site.
- Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company.
- Construction workers must also be provided with identification tags.

Creation of informal settlements:

- Facilitate the establishment of a “Community Safety Committee” to monitor and control illegal squatting. Committee to consist of:
    - The community relations Department of NamWater;
    - The Local Council;
    - Local landowners;
    - Representatives of local community structures; and
    - Local police and the Community Policing Forum
- Align social investment strategies with municipal development.

- NamWater employees who receive living-out allowances should be required to provide proof that this allowance is used for formal accommodation.
- Include a requirement in the Conditions of Service of construction contractors that construction workers must be vacated from the area once construction is completed.

Local employment and job opportunities:

- Unskilled job opportunities should be afforded to the local communities, as far as possible.
- Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities.
- Individuals with the potential to develop their skills should be afforded training opportunities.
- Payment should comply with applicable labour legislation in terms of minimum wages.
- Where local labourers are employed on a permanent basis, these labourers should be registered with the official bodies as required by law. This would enable the workers to claim unemployment.

Local economy opportunities and economic empowerment:

- The developer to encourage, in consultation with key stakeholders, construction companies to use local services.
- Local procurement opportunities.
- Implement community contracting and training.
- Create a platform where development of micro, small and medium enterprises is developed.

Various social pathologies:

- Implement HIV/ AIDS, alcohol abuse, drug abuse, and domestic violence prevention and awareness campaigns in the communities.
- The contractors should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a minimum, include programmes to combat HIV/ AIDS and TB.
- The contractor should make HIV/ AIDS and STI awareness and prevention programmes a condition of contract for all suppliers and sub-contractors.

Crime:

- Regarding safety and security, construction workers should be clearly identifiable.
- Overalls should have the logo of the construction company on it and construction workers should wear identification cards.
- The construction site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard.

- Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations

Noise:

- Construction activities should be restricted to daytime hours between 07:00 to 18:00.
- Adjacent households should be consulted and notified of any construction activities that could lead to excessive noise levels in advance.
- The households should also be consulted if any night time construction activities are to take place.

Disruption of access:

- Unauthorised access to the construction site must be prevented through appropriate fencing and security.
- When the construction period has ended the implementation of adequate rehabilitation measures to return the landscape and other changes to at least its original state.

Displacement:

- Inform affected people of their options and rights concerning resettlement.
- Provide technically and economically feasible options for resettlement based on consultation with affected people and assessment of resettlement alternatives.
- Whether physical relocation is required or not, provide affected people with prompt and effective compensation at full replacement value for loss of assets due to project activities.
- Where physical relocation is necessary, provide assistance with relocation expenses (moving allowances, transportation, special assistance and health care for vulnerable groups).
- Where physical relocation is necessary, provide temporary housing, permanent housing sites, and resources (in cash or in kind) for the construction of permanent housing—inclusive of all fees, taxes, customary tributes, and utility hook-up charges—or, as required, agricultural sites for which a combination of productive potential, locational advantages, and other factors are at least equivalent to the advantages of the old site.
- Provide affected people with transitional financial support (such as short-term employment, subsistence support, or salary maintenance).
- Where necessary, provide affected people with development assistance in addition to compensation for lost assets described above such as land preparation, agricultural inputs, and credit facilities and for training and employment opportunities.

Informal settlements:

- Once construction is completed and the construction camp vacated, the camp must be demolished to avoid settling of informal residents. Alternatively, if the camp is to be made

available for use by other contractors on other projects, it should be “mothballed” until the new occupants take up residence.

Secure accommodation for construction

- One option would be to house them in a construction village. The other option will be to house them in nearby settlements. This may require that the Local Council or NamWater invest in the construction of additional housing units.
- It is recommended that one construction village be used to house construction workers of the project components to minimise the extent of pressure the additional housing will exert on social and council infrastructure.
- Maximisation of the proportion of job opportunities allocated to locals, thus reducing the need for outsiders
- Provision of sufficient entertainment facilities (e.g. lounge with TV, pool table, etc.)
- Demolishing construction village after construction activities have finished, or donating the construction camp to the local municipality for formal housing, or alternatively convert the construction camp to permanent housing for labourers during the operational phase.

Gender impacts:

- Detailed and specialised gender awareness must be provided. This can be set up in different forms, such as training courses, activities and promotion to enable individuals to implement gender mainstreaming in their everyday work.
- Participation of both genders in decision-making. An equal participation of both genders is important not only in decision-making but also for gender mainstreaming, in general.
- The division of labour by gender. The structures which organise the division of labour must ensure that no discrimination occur because of gender.
- Training and skills transfer. No discrimination must occur because of gender.
- Receive comparable social and economic benefits.

8 Conclusion

The study has identified the following potential negative impacts associated with the construction phase of the proposed project, they include amongst others:

- Influx of construction workers employed on the project and who are housed in the construction village used for other constructions in the area;
- Influx of job seekers looking for work but who are unsuccessful;
- Increased risk to personal safety of farmers;
- Potential noise and dust impacts during the construction phase;
- Access problems during construction phase;
- Gender impacts.

Of the negative impacts, the influx of construction workers housed on the construction village and influx of job seekers from neighbouring communities were identified as the key social concerns.

While the presence of construction workers and job seekers do not in themselves constitute a social impact, the way the construction workers and job seekers conduct themselves can affect the local community.

The main area of concern identified during the study was the potential impact on existing family structures and social networks. The potential impact on family structures and social networks are linked to the potential behaviour of male construction workers and the implications that this may have in terms of:

- A potential increase in alcohol and drug use;
- A potential increase in crime levels;
- A potential increase in teenage and or unwanted pregnancies;
- Potential increase in prostitution and increase in transmission of STI's and specifically HIV/AIDS;
- Loss of partners and/ or wives to construction workers with associated (and potentially violent) conflict.

These aspects, specifically the links between alcohol, drugs, prostitution and crime, are all interrelated.

Furthermore, it can also be concluded that many of the significant socio-economic impacts of the proposed development will occur during the construction phase. Positive impacts during this phase will include temporary creation of employment opportunities, as well as concomitant economic benefits and possible creation of opportunities for establishment of small businesses.

Finally, socio-economic environment in general poses no significant adverse socio-economic impacts for the construction of the proposed project. However, this is dependent on the mitigation measures identified in this document being implemented and adhered to. This is particularly relevant where construction activities could affect the quality of life of adjacent households in terms of access, noise, dust, safety and security

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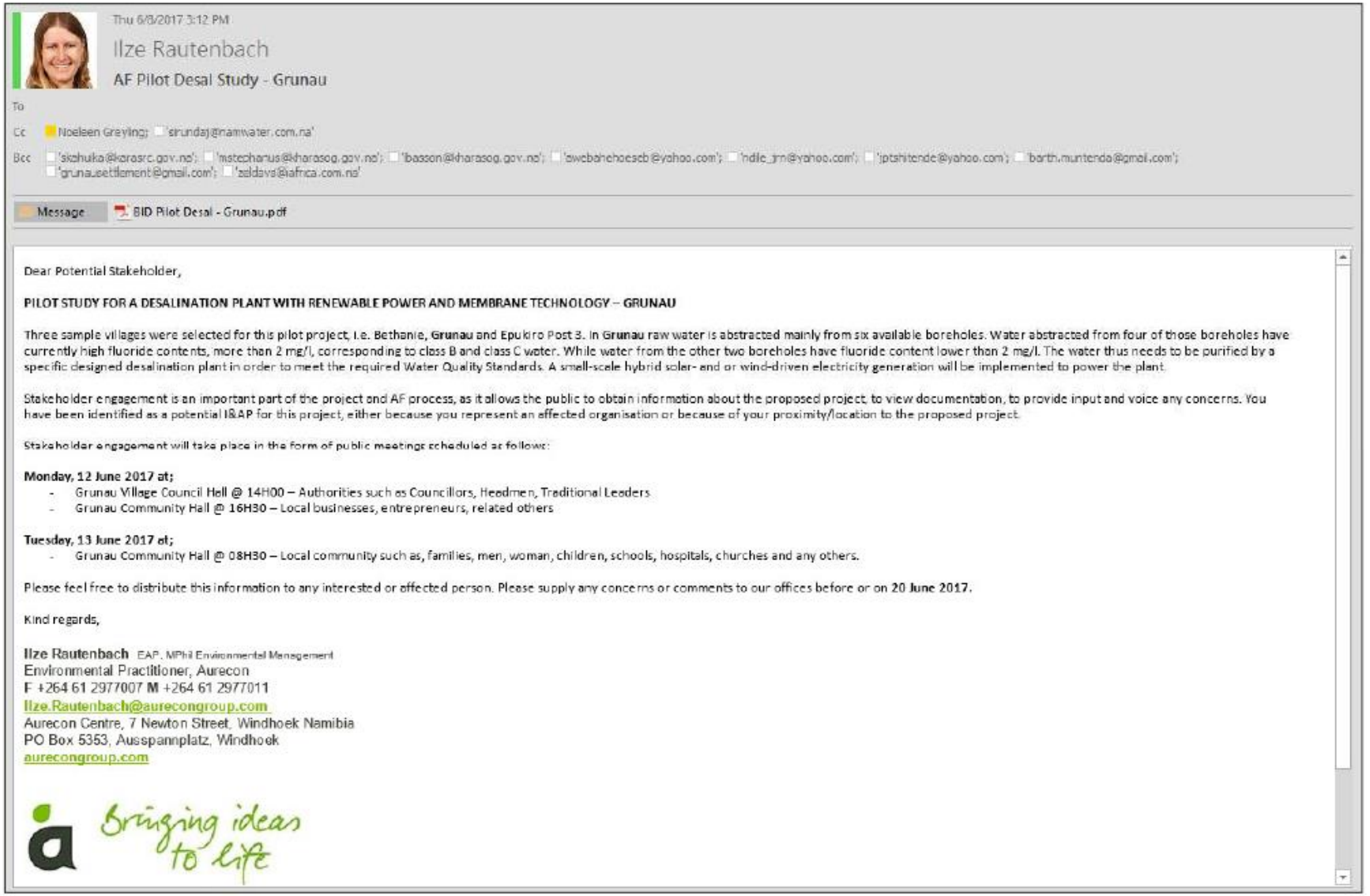
Appendix A – Emails



Thu 6/8/2017 3:12 PM

Ilze Rautenbach

AF Pilot Desal Study - Grunau

To

Cc Noeleen Greyling; 'srundaj@namwater.com.na'

Bcc 'skshuka@kharasrc.gov.na'; 'mstecharius@kharasog.gov.na'; 'lbasson@kharasog.gov.na'; 'owebahehoesch@yahoo.com'; 'ndile_jm@yahoo.com'; 'jptshitende@yahoo.com'; 'barth.muntenda@gmail.com'; 'grunau.settlement@gmail.com'; 'zeldavs@iafrica.com.na'

Message BID Pilot Desal - Grunau.pdf

Dear Potential Stakeholder,

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY – GRUNAU

Three sample villages were selected for this pilot project, i.e. Bethanie, **Grunau** and Epukiro Post 3. In **Grunau** raw water is abstracted mainly from six available boreholes. Water abstracted from four of those boreholes have currently high fluoride contents, more than 2 mg/l, corresponding to class B and class C water. While water from the other two boreholes have fluoride content lower than 2 mg/l. The water thus needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards. A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

Stakeholder engagement is an important part of the project and AF process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns. You have been identified as a potential I&AP for this project, either because you represent an effected organisation or because of your proximity/location to the proposed project.

Stakeholder engagement will take place in the form of public meetings scheduled as follows:

Monday, 12 June 2017 at;

- Grunau Village Council Hall @ 14H00 – Authorities such as Councillors, Headmen, Traditional Leaders
- Grunau Community Hall @ 16H30 – Local businesses, entrepreneurs, related others

Tuesday, 13 June 2017 at;

- Grunau Community Hall @ 08H30 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

Please feel free to distribute this information to any interested or effected person. Please supply any concerns or comments to our offices before or on **20 June 2017.**

Kind regards,

Ilze Rautenbach EAP, MPhil Environmental Management
Environmental Practitioner, Aurecon
F +264 61 2977007 M +264 61 2977011
Ilze.Rautenbach@aurecongroup.com
Aurecon Centre, 7 Newton Street, Windhoek Namibia
PO Box 5353, Ausspannplatz, Windhoek
aurecongroup.com

Bringing ideas to life

Ilze Rautenbach

From: Susan Mentor
Sent: Friday, June 9, 2017 9:05 AM
To: geduldprimaryschool@gmail.com
Cc: Ilze Rautenbach
Subject: FW: Message from "RNP0026739C96CA"
Attachments: 20170609104121255.pdf

Dear All

Please find documents.

Regards.

Susan Mentor
Receptionist, Aurecon
F +264 61 2977007 M +264 61 2977000
Susan.Mentor@aurecongroup.com

-----Original Message-----
From: scans@aurecongroup.com [mailto:scans@aurecongroup.com]
Sent: Friday, June 09, 2017 8:41 AM
To: Susan Mentor <Susan.Mentor@aurecongroup.com>
Subject: Message from "RNP0026739C96CA"

This E-mail was sent from "RNP0026739C96CA" (MP C5503).

Scan Date: 06.09.2017 10:41:21 (+0300)
Queries to: scans@aurecongroup.com

Ilze Rautenbach

From: Susan Mentor
Sent: Thursday, June 8, 2017 4:32 PM
To: wella@iafrica.com.na
Cc: Ilze Rautenbach
Subject: FW: Message from "RNP0026739C96CA"
Attachments: 20170608181708871.pdf

Dear Ronel

Please find attached documents.

Regards.

Susan Mentor
Receptionist, Aurecon
F +264 61 2977007 M +264 61 2977000
Susan.Mentor@aurecongroup.com

-----Original Message-----
From: Anne-Marie Hoenck
Sent: Thursday, June 08, 2017 4:17 PM
To: Susan Mentor <Susan.Mentor@aurecongroup.com>
Subject: Message from "RNP0026739C96CA"

This E-mail was sent from "RNP0026739C96CA" (MP C5503).

Scan Date: 06.08.2017 18:17:08 (+0300)
Queries to: scans@aurecongroup.com

Ilze Rautenbach

From: Susan Mentor
Sent: Thursday, June 8, 2017 4:28 PM
To: grunauch@iway.na
Cc: Ilze Rautenbach
Subject: FW: Message from "RNP0026739C96CA"
Attachments: 20170608181708871.pdf

Dear Sir/Madam

Please find documents attached.

Regards.

Susan Mentor
Receptionist, Aurecon
F +264 61 2977007 M +264 61 2977000
Susan.Mentor@aurecongroup.com

-----Original Message-----
From: Anne-Marie Hoenck
Sent: Thursday, June 08, 2017 4:17 PM
To: Susan Mentor <Susan.Mentor@aurecongroup.com>
Subject: Message from "RNP0026739C96CA"

This E-mail was sent from "RNP0026739C96CA" (MP C5503).

Scan Date: 06.08.2017 18:17:08 (+0300)
Queries to: scans@aurecongroup.com

Ilze Rautenbach

From: Susan Mentor
Sent: Thursday, June 8, 2017 4:23 PM
To: withuis@iway.na
Cc: Ilze Rautenbach
Subject: FW: Message from "RNP0026739C96CA"
Attachments: 20170608181708871.pdf

Dear All

Please find documents.

Regards.

Susan Mentor
Receptionist, Aurecon
F +264 61 2977007 M +264 61 2977000
Susan.Mentor@aurecongroup.com
-----Original Message-----
From: Anne-Marie Hoenck
Sent: Thursday, June 08, 2017 4:17 PM
To: Susan Mentor <Susan.Mentor@aurecongroup.com>
Subject: Message from "RNP0026739C96CA"

This E-mail was sent from "RNP0026739C96CA" (MP C5503).

Scan Date: 06.08.2017 18:17:08 (+0300)
Queries to: scans@aurecongroup.com

Appendix B – Poster

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY – GRUNAU

Applicant: Namibia Water Corporation Ltd in collaboration with the Desert Research Foundation of Namibia (DRFN) with a Project Formulation Grant (PFG) from the Adaptation Fund

Environmental consultants: Aurecon Namibia

Project: This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

AF Funding Process: To be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through screening process
2) Environmental, social, and gender assessment (ESIA) – only risk identification at this stage
3) Environmental and social management plans (ESMP)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – data gathering
5) Public disclosure and consultation (stakeholder engagement)
6) Grievance mechanism developed.

How to Get Involved: Stakeholder engagement is an important part of the project and AF process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns.

Stakeholder engagement will take place in the form of public meetings scheduled as follows:

Monday, 12 June 2017 at;

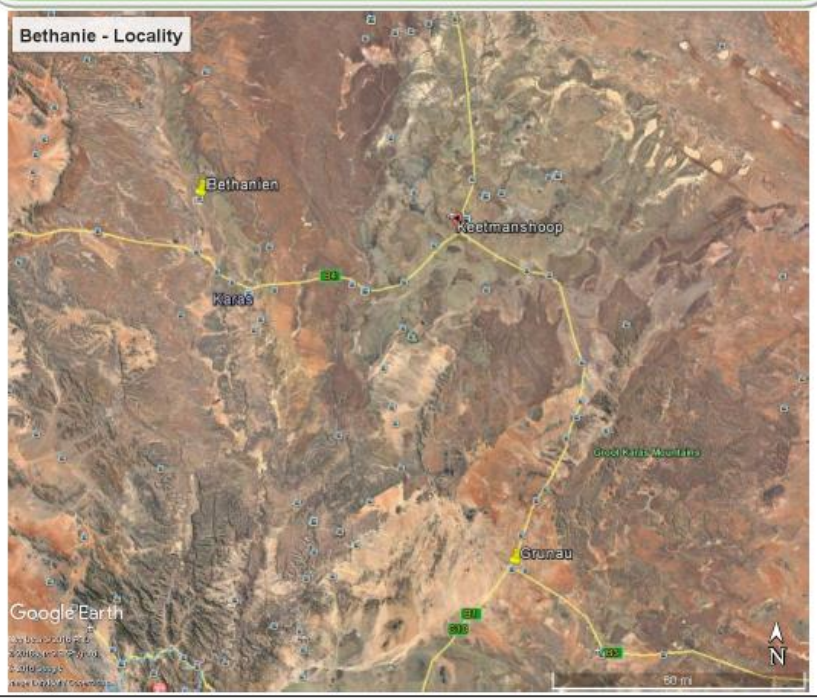
Grunau Town Council Hall @ 14H00 – Authorities such as Councillors, Headmen, Traditional Leaders

Grunau Community Hall @ 16H30 – Local businesses, entrepreneurs, related others

Tuesday, 12 June 2017 at;

Grunau Community Hall @ 08H30 – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

ENVIRONMENTAL & SOCIAL CONSULTANT CONTACT
Mrs Ilze Rautenbach & Mrs Noeleen Greyling
Tel: +264 61 297 7000 / 11
Fax: +264 61 297 7007
Email: ilze.rautenbach@aurecongroup.com



Appendix C – Presentation

ADAPTATION FUND

NAMWATER
Namibia Water Corporation Ltd

DREN

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY

Project introduction

June 2017

aurecon

aurecon

Namibia depends heavily on its groundwater resources

- Groundwater reserves not reliable
- Groundwater poor quality

Climate change plays a large role on water quantity and its quality specifically in the very arid and climate variation found within Namibia, hence the reason to adapt using desalination and more renewable technologies.

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Project Goals

This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

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Bringing ideas to life

Namibia Water Corporation Ltd as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology.

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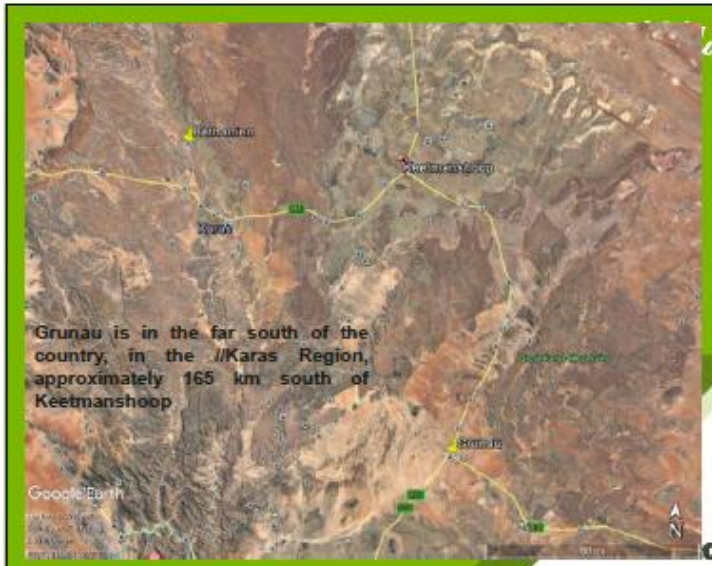
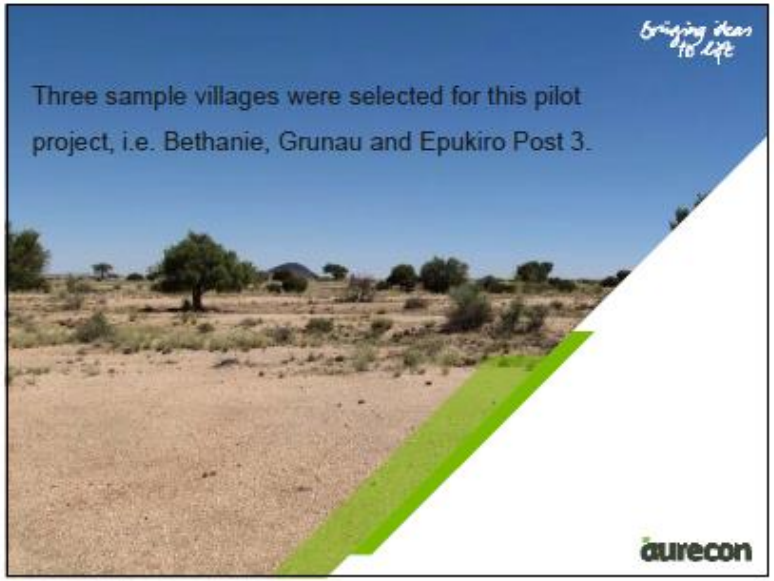


Bringing ideas to life

Three sample villages were selected for this pilot project, i.e. Bethanie, Grunau and Epukiro Post 3.



aurecon

Bringing ideas to life

The water source for Grunau is stressed as the combined yield of the current six boreholes is not enough to cope with the demand. Future development of the scheme consisting on the installation and connection of four additional boreholes that will allow to meet the actual demand.

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In Grunau raw water is abstracted mainly from six available boreholes. Water abstracted from four of those boreholes have currently high *fluoride* contents, more than 2 mg/l, corresponding to class B and class C water. While water from the other two boreholes have fluoride content lower than 2 mg/l. The water thus needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards.

A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

Project components

- Desalination plant and distribution of water
- Hybrid solar + wind power plant
- Training
- Sensitisation
- Pilot phase operation (2 years)
- Replication within Namibia

AF Funding Process

Bringing ideas to life

In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through screening process
2) Environmental, social, and gender assessment (ESIA) – only risk identification at this stage
3) Environmental and social management plans (ESMP)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – data gathering
5) Public disclosure and consultation (stakeholders)
6) Grievance mechanism developed

aurecon

How to Get Involved

Bringing ideas to life

Monday, 12 June 2017 at:

- Grunau Village Council Hall @ **14H00** – Authorities such as Councilors, Headmen, Traditional Leaders
- Grunau Community Hall @ **16H30** – Local businesses, entrepreneurs, related others

Tuesday 13 June 2017 at:

- Grunau Community Hall @ **08H30** – Local community such as, families, men, woman, children, schools, hospitals, churches and any others.

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ENVIRONMENTAL & SOCIAL CONSULTANT CONTACT

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P.O Box 5353 Ausspannplatz, Windhoek

Appendix D – BIDs

ADAPTATION FUND

LOODSSTUDIE VIR 'N ONTSOUTINGSAANLEG MET HERNUBARE KRAG EN MEMBRAANTEGNOLOGIE - GRUNAU

JUNIE 2016

AGTERGROND INLIGTINGSDOKUMENT

Inleiding

Die voorgestelde projek beoog om 'n metode te toets vir die verbetering van 'n versekerde voorraad van goeie kwaliteit grondwater aan klein dorpies in Namibië. Dit sal verder die veerkragtigheid van sulke gemeenskappe verbeter teen die verhoogde variasie in reënval wat met klimaatsverandering verwag word.

As 'n droë land maak Namibië baie staat op sy ondergrondse waterbronne. Dit bring twee uitdagings: veroorsaak hoë reenval variasie, wisseling van die herlaai van waterbronne dus is grondwaterreserwes is in baie plekke nie betroubaar nie. Tweedens is die kwaliteit van grondwater in baie plekke swak en onder die drempels vir sekere chemikalieë (bv. floried, en totale opgeloste vaste stowwe en soutgehalte) vir veilige menslike gebruik. Dit vereis water behandelingstegnieke soos filtrasie en ontsouting wat weer energie in die vorm van elektrisiteit benodig.

As sulks het die Namibië Water Korporasie Edms as 'n uitvoerende entiteit in samewerking met die Woestyn Navorsingstigting van Namibië (WNSN) as 'n implenteringsentiteit, aansoek gedoen vir 'n Projek Formuleringstoelaag (PFT) by die Aanpassingsfonds. Die toelaag is toegeken vir die formulering van 'n volledige projekvoorleging op die Ontsouting van swak waterkwaliteit van die gekose behandelingsaanlegte wat Hernubare Krag en Membraantegnologie gebruik.

Drie voorbeeld dorpies is gekies vir hierdie loodsstudie, m.a.w Bethanie, **Grunau** en Epukiro Pos 3. In Grunau word die water verkry vanuit ses beskikbare boorgate. Water verkry vanuit vier van hierdie boorgate het baie hoë floried inhoud, meer as 2 mg/l, wat vergelyk met 'n klas B en C water. Terwyl water vanuit die ander twee boorgate weer floried laer as 2 mg/l lewer. Die water moet dus gesuiwer word deur 'n spesifieke ontwerpde ontsoutingsaanleg om te voldoen aan die vereiste van die Water Kwaliteitsstandaarde. 'n Klein-skaalse hibriede son- en of windgedrewe elektisiteit genererende toestel sal geïmplimenteer word om die aanleg vaart te dryf.

Indien suksesvol sal die projek 'n nuttige metode demonstreer wat uitgerol kan word om soortgelyke behoeftes in afgeleë gemeenskappe in Namibië by te kom en elders om die watersituasie vir afgeleë dorpe en nedersettings te verbeter in die gesig van klimaatsverandering.

DOEL VAN HIERDIE DOKUMENT

Die doel van hierdie AID is om vir alle aandeelhouers 'n agtergrond te gee oor die voorgestelde loodsstudies en om hulle uit te nooi om te registreer as Belangstellende en Geaffekteerde Partye (B&GPs). Deur te registreer as B&GPs kan aandeelhouers kommentaar gee en insette lewer op die voorgestelde studies terwyl hulle ingelig sal bly tydens die projekproses.

Hersien asseblief hierdie AID en stuur u geskrewe kommentaar op skrif op of voor:
Dinsdag 20 Junie 2017

NAMWATER Namibia Water Corporation Ltd

aurecon

Voorgestelde Projek en Ligging

Bethanie is in die verre suide van die land, in die //Karasstreek, ongeveer 165km suid van Keetmanshoop – verwys na Figuur 1 hieronder. Grunau verkry sy water van ses boorgate. Die watervoorraadskema word bestuur deur NamWater en die Karasburg Kiesafdeling is verantwoordelik vir die bestuur van die waterdreinering. //Karas streek het n populasie van ongeveer 77 000 met Karasburg Kiesafdeling ongeveer 4400 inwoners (2011 Census).

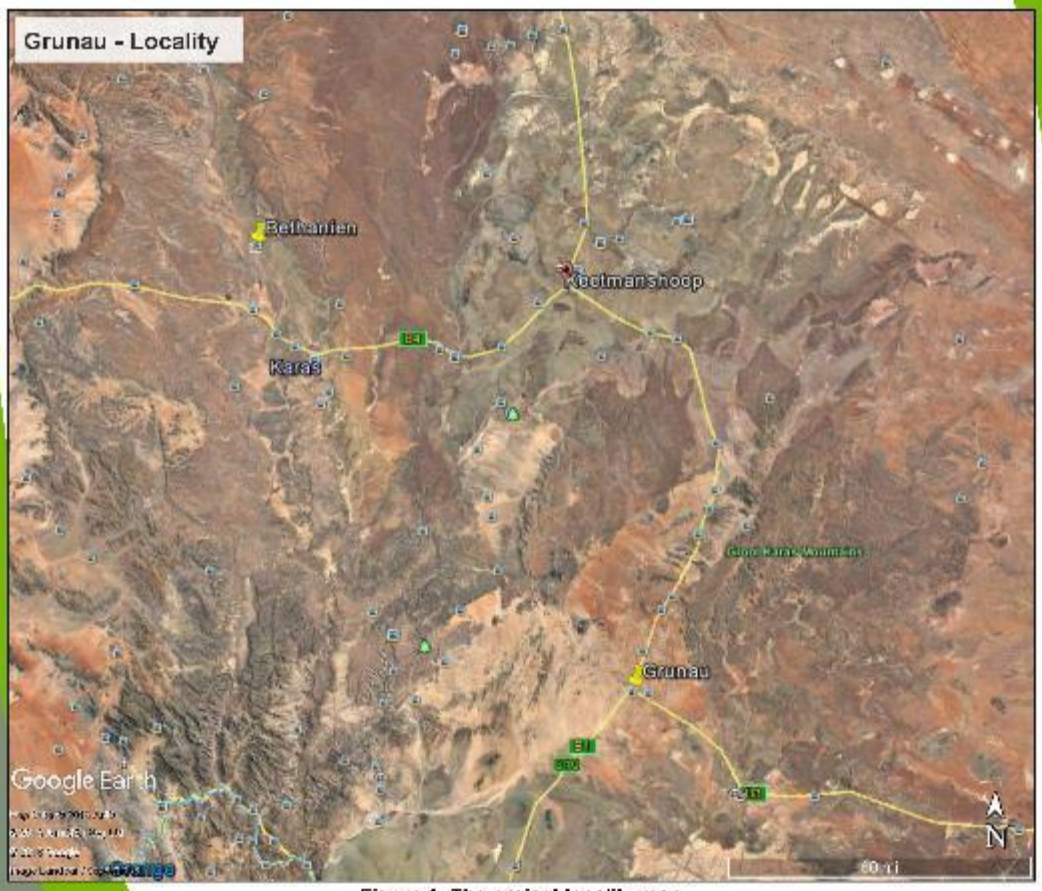

Figure 1: The project locality map

Die hoofdoel van hierdie projek is om die effektiwiteit van 'n stelsel te toets wat hernubare energie kombineer met die behoeftes van die watersektor om die veerkragtigheid teen klimaatsverandering te verbeter. Die projek sal kleinskaalse son- en of wind gedrewe ontsoutingsaanlegte verfyn om die kwaliteit van gekose ondergrondse waterbronne vir menslike gebruik te verbeter en sal poog om die koste van water aan gemeenskappe wat deur hierdie skemas bedien word te verminder. 'n Suksesvolle demonstrasie van die metodes sal lei tot verdere uitrol aan ander plekke in die land.

Die water oron vir Grunau is onder geweldige groot druk omdat die gekombineerde opbrengs van al ses boorgate steeds nie genoeg is om die bestaande aanvraag te vul nie. Toekomstige ontwikkeling van die skema sal bestaan

uit die aanvulling van nog vier poorgate wat sal help om die aanvraag te bereik. Dit is steeds onwaarskynlik dat die kwaliteit gehalte van die floried vlakke onder 2 mg/l sal verbeter al word die ekstra grondwater bygevoeg. Dus sal die bestaande of toekomstige water steeds nie aan Namibië se Water Kwaliteitsstandaarde voldoen nie en wat 'n impak op veral die gesondheid van kinders in die plaaslike gemeenskap het. Die aanleg sal help om die produkwater wat deur die gemeenskap gebruik sal word te verbeter.

AF Bevondsingsproses

Om vir befondsing aansoek te doen by die Aanpassingsfonds moet die volgende stappe in die Omgewings-en Maatskaplike Bestuurstelsel (OMBS) hand elding voltooi word. Hierdie stappe is as volg:

1) Identifisering van Omgewings, maatskaplike en geslagsrisiko's deur 'n **siftingsproses**
2) Omgewings, maatskaplike en geslagsassessering (OMGA) – **slegs risiko identifisering op hierdie stadium**
3) Omgewings en maatskaplike bestuursplanne **(OMBP)**
4) Omgewings, maatskaplike en geslagsbestuur monitering, rapportering en evaluering – **data-insameling**
5) Publieke bekendmaking en konsultering **(aandeelhouer betrokkenheid)**
6) **Griefmeganisme** ontwikkel

Hoe om Betrokke te Raak

Aandee houer betrokkenheid is 'n be angrike deel van die projek er AF proses, omdat dit die publiek toelaat om inligting oor die voorgestelde projek te bekom, om na dokumentasie te kyk, om insette te ewer en enige bekommernisse te lig. U is as potensiële B&GP vir hierdie projek identifiseer, of omdat u 'n geaffekteerde organisasie verteenwoordig of weens u nabyheid/ligging van die voorgestelde projek.

Aandee houer betrokkenheid sal plaasvind in die vorm van openbare vergaderings wat as volg geskeduleer is:

Maandag, 12 June 2017 at;

- Grunau Dorp Stadsaal @ 14H00 – Owerhede soos Raads ede, Hoofmanne er Tradisionele Leiers
- Grunau Gemeenskapsaal @ 16H30 – Plaaslike besighede, entrepreneurs en ander wat verband hou

Tuesday, 13 June 2017 at;

- Grunau Gemeenskapsaal @ 08H30 – Plaaslike gemeenskap soos families, mans, vrouens, kinders, hospitale, kerke en enige ander.

ENVIRONMENTAL & SOCIAL CONSULTANT CONTACT
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ADAPTATION FUND

PILOT STUDY FOR A DESALINATION PLANT WITH RENEWABLE POWER AND MEMBRANE TECHNOLOGY – GRUNAU

JUNE 2016

BACKGROUND INFORMATION DOCUMENT

Introduction

This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

As an arid country, Namibia depends heavily on its groundwater resources. This brings two challenges: high rainfall variability makes recharge into aquifers also variable, so groundwater reserves in many places are not reliable. Secondly, groundwater quality is poor in many places, below the thresholds for certain chemicals (e.g. fluoride, total dissolved solids and salinity) for safe human consumption. This requires water treatment techniques, such as filtration or desalination. These in turn demand energy in the form of electricity.

As such the Namibia Water Corporation Ltd as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund. The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology.

Three sample villages were selected for this pilot project, i.e. Bethanie, **Grunau** and Epukiro Post 3. In Grunau raw water is abstracted mainly from six available boreholes. Water abstracted from four of those boreholes have currently high *fluoride* contents, more than 2 mg/l, corresponding to class B and class C water. While water from the other two boreholes have fluoride content lower than 2 mg/l. The water thus needs to be purified by a specific designed desalination plant in order to meet the required Water Quality Standards. A small scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

If successful, this project will demonstrate a useful method that can be rolled out to meet similar needs in off-grid communities in Namibia and elsewhere to improve the water situation for remote villages and settlements in the face of climate change.

PURPOSE OF THIS DOCUMENT

The purpose of this BID is to provide all stakeholders with a background to the proposed pilot studies and to invite them to register as Interested and Affected Parties (I&APs). By registering as I&APs, stakeholders can submit comments and provide inputs on the proposed studies and will be kept informed throughout the project process.

Please review this BID and submit your comments in writing on or before:
Tuesday 20 June 2017

DRFN

NAMWATER Namibia Water Corporation Ltd

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Proposed Project and Location

Grunau is in the far south of the country, in the //Karas Region, approximately 165 km south of Keetmanshoop – refer to Figure 1 below. Grunau obtains its water from six boreholes. The water supply scheme is managed by NamWater and the Karasburg Constituency is responsible for the management of the water reticulation. //Karas region has a population of about 77 000 with Karasburg Constituency estimated at 4400 people (2011 Census).

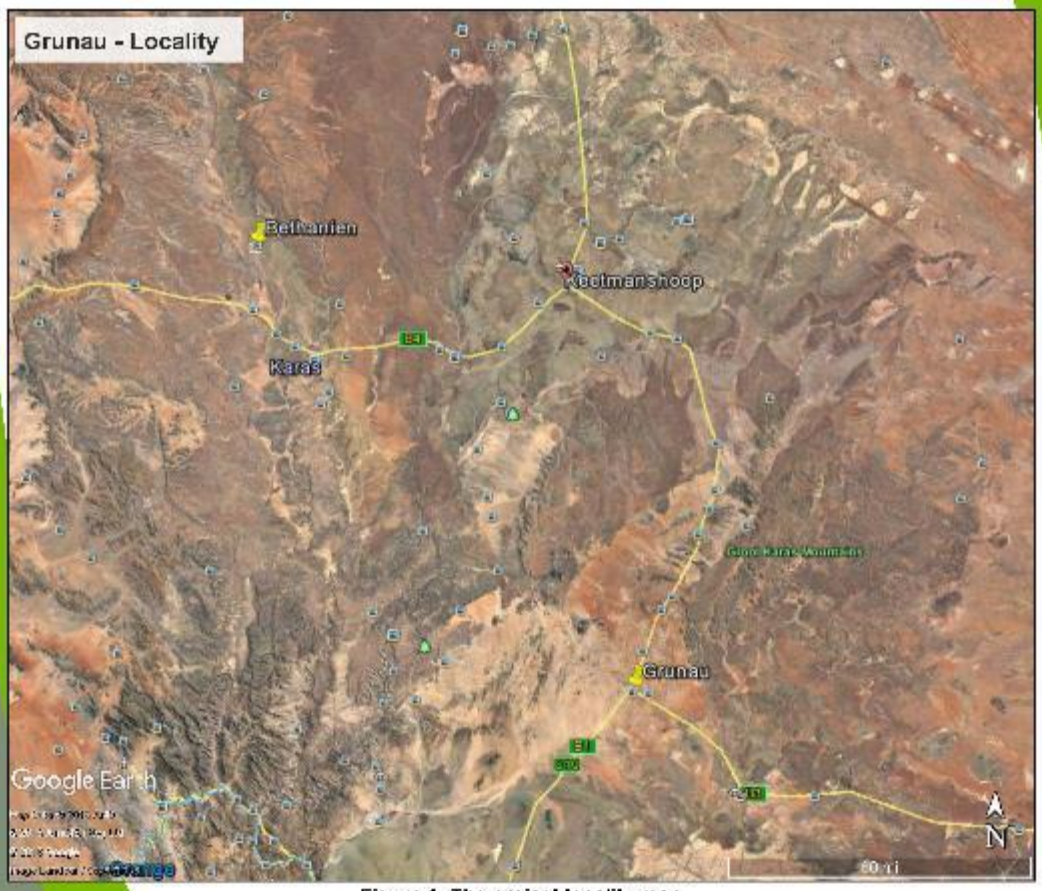

Figure 1: The project locality map

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes. A successful demonstration of the methods will enable further roll-out to other sites in the country.

The water source for Grunau is stressed as the combined yield of the current six boreholes is not enough to cope with the demand. Future development of the scheme consisting on the installation and connection of four additional boreholes that will allow to meet the actual demand. But the water quality target of obtaining fluoride

levels in product water lower than 2 mg/l is unlikely to be achieved with the incorporation of these four new boreholes. Therefore the current and potential future water does not meet Namibia's Water Quality Standards, and impacts on the health of the local population, especially children. The plant will improve the product water to be used by the community.

AF Funding Process

In order to be able to apply for funding from the Adaptation Fund, the following steps as outlined in the Environmental and Social Management System (ESMS) manual needs to be completed. The steps are as follows:

1) Environmental, social, and gender risks identification through **screening process**
2) Environmental, social, and gender assessment (ESIA) – **only risk identification at this stage**
3) Environmental and social management plans (**ESMP**)
4) Environmental, social, and gender management monitoring, reporting, and evaluation – **data gathering**
5) Public disclosure and consultation (**stakeholder engagement**)
6) **Grievance mechanism** developed

How to Get Involved

Stakeholder engagement is an important part of the project and AF process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns. You have been identified as a potential I&AP for this project, either because you represent an affected organisation or because of your proximity/location to the proposed project.

Stakeholder engagement will take place in the form of public meetings scheduled as follows:

Monday, 12 June 2017 at;

- Grunau Village Council Hall @ 14H00 – Authorities such as Councilors, Headmen, Traditional Leaders
- Grunau Community Hall @ 16H30 – Local businesses, entrepreneurs, related others

Tuesday, 13 June 2017 at;

- Grunau Community Hall @ 08H30 – Local community such as, families, men, women, children, schools, hospitals, churches and any others.

ENVIRONMENTAL & SOCIAL CONSULTANT CONTACT

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Email: ilze.rautenbach@aurecongroup.com

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NAMWATER Namibia Water Corporation Ltd

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Appendix E – Attendance Register and Stakeholder Database

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NAMWATER Namibia Water Corporation Ltd

ATTENDANCE REGISTER

MEETING: Village Council/Headmen VENUE: Grunau - Council/Comm Hall DATE & TIME: 12/06/2017 @14:00

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
1	FRIEDRICH L. ALTER	M	F	35	SAO	grunausettlement@gmail.com	0817480198
2	TIMS CHRISTIAN	M	F	54	MEMBER SDC	—	0818482105
3	FREDERICK MEINTJIES	M	F	29	SDC MEMBER	—	0816610747
4	J.P. MARICUS	M	F	46	SDC MEMBER	grunausettlement@gmail.com	0816047973
5	J. BANTAM	M	F	63	SDC "	—	0813498505
6	AMANDA CHRISTIAN	M	F	37	SDC "	—	0816951571
7	MOSES PIETERS	M	F	43	SDC MEMBER		0814066749
8		M	F				
9		M	F				
10		M	F				
11		M	F				
12		M	F				

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ATTENDANCE REGISTER

MEETING: Business & Related / Community GRUNAU VENUE: Grunau - Council Community Hall DATE & TIME: 08/30 2017/06/13

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
25	Roberto Keister	(M)	F	20	Auto Mechanic Interest		0816945015
26	Merzil Jossop	(M)	F	31	Health Ass. Worker	Naasjossop@gmail.com	0812171335
27	Helly Christiaan	M	F	31			0818441089
28	Sieglinda Ortman	M	F	18			0818705063
29	[illegible]	M	F ✓	63	Pensioner		0812095371
30	[illegible] Hartbees	M	F ✓	46	Unemployed		
31	Jantjie Christiaan	(M)	F	25	Auto Mechanic Int		0814794716
32	Jacqueline Witbooi	M	(F)		Unemployed	[illegible]	0818705097
33	Mary-Jane Jossop	M	(F)	27	HBW	[illegible]	0816824657
34	Lena Swartbooi	M	(F)	54	Unemployed.		0812062063
35	Elizabeth Christiaan	M	(F)	33	P.C Clerk.	[illegible]	0858998885
36	Winson Christiaan	(M)	F	29	Unemployed	[illegible]	0816404238

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ATTENDANCE REGISTER

MEETING: BUSINESS & RELATED / GRUNAU COMMUNITY   VENUE: GRUNAU COUNCIL / COMM HALL   DATE & TIME: 13.06.2017 ~~16:30~~ 08:30

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
13	A.P. Makais	M ✓	F	61	Manager Firm	WILLIE@iAFRICA.COM.NA	081685538
14	D. Bantani	M	F	63	Settlement Com.	—	0813498505
15	Isak April	M ✓	F				
16	Lucia Frederik	M	F	35			0818883518
17	Magdalena Swartkooi	M	F ✓	41			0813541421
18	Marné Christiaan	M	F ✓	23	Unemployed	Shadeychristiaan6@gmail.com	0817408934
19	Annelise Nordstrom	M	F ✓	22		ashleeeen.65@gmail.com	081 780 3890
20	Wilhelmina Cooper	M	F		Unemployed		0813707268
21	Benadna Plaatjies	M	F ✓	26	Unemployed	—	0815894379.
22	Lorna Swartbooi	M	F ✓				0813764427
23	Zilke Swartbooi	M	F ✓		"	Bewerley87@gmail.com	0815928641
24	Bonaventura Swartbooi	M	F ✓		"		0813924633

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ATTENDANCE REGISTER

MEETING: GRUNAU BUSINESS & RELATED COMMUNITY VENUE: GRUNAU - Council / COMM HALL DATE & TIME: 13·06·2011 08:30 ~~16:30~~

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
1	Sara April	M	✓	62			
2	Dorothea Rooi	M	F✓	65			
3	MAUREEN SWARTBOOI	M	F✓	42			0815741711
4	Millicent Christiaan	M	F	59			0814471329
5	Helmuth !Gaoseb	M✓	F				0812025789
6	Anne-Marie Windstaan	M	F✓	43			0815701176
7	A.L. MURPHY	M	F	58			0812041523
8	A. Meintjies	M	F	35			0812239062
9	Alet Fredericks	M	F	22			0817541915
10	Christine Meintjies	M	F✓	37	Kindergarten Teacher		[illegible]
11	Charlotte Roos	M	F	25			0813930472
12	Emeli Jacobs	M✓	F	19			0818329095

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ATTENDANCE REGISTER

MEETING: GRUNAU. Community VENUE: Grunau Community Hall DATE & TIME: 13 JUNE 8:30 -

	Name & Surname	Gender		Age	Position / Interest	Email	Contact number / Postal
37	Christina E. I Geiseses	M	F	51	Hostel Matron		081 2095 789
38	Maria Christian	M	F	54	Hostel. co-worker		0816448245
39	GLENTON JOSSOP	M	F	20	N/A	glentonjossop@gmail.com	081 3384898
40	BRENDON SWARTBOOI	M	F	24	N/A		0816852930
41	Jacques Christian	M	F	23	N/A		0818575414
42		M	F				
43		M	F				
44		M	F				
45		M	F				
46		M	F				
47		M	F				
48		M	F				

Grünau Stakeholders

Area	Name of Institution	Name of CEO/MD/Contact	Tel Number	Fax Number	e-mail Address	Postal Address
Grünau	Grünau Village Council	Sigfried Araseb	063-262030		Grünausettlement@gmail.com	P.O. Box 21, Grünau
	Grünau Country House Hotel Pension & Rest Camp		+264 63 262 001			
	Grünau Chalets & Motors		+264 63 262 026			PO Box 3 Granau
	Vastrap Guestfarm		+264 63 262 063			
	Primary School Geduld		+264 (063) 262024			PO Box 32, Grünau, Namibia
	Savanna Guest Farm		+ 264 63 262070		zeldavs@iafrica.com.na	Postal Address: Box 14 Grünau
	White House Rest Camp		+ 264 63 262061	+ 264 63 262061		Postal Address: Box 9 Grünau

NAME & SURNAME	GENDER	AGE	POSITION / INTEREST	EMAIL ADDRESS	CONTACT DETAILS
Sara April	M	62			
Dorothea Rooi	F	65			
Maureen Swartbooi	F	42			(81) 574-1711
Niulaas Christiaan	M	59			(81) 449-1329
Holmuth Gaoseb	M				(81) 202-6189
Anne-Marie Windstaan	F	43			(81) 570-1176
D.L. Murphy	M	59			(81) 204-1523
A Maintjies	M	35			(81) 223-9062
Alet Fredericks	F	22			(81) 754-1915
Lorraine Meintjies	F	37	Kindergarten Teacher		(81) 216-7523
Charlotte Roos	F	25			(81) 393-0472
Entru Jourtze	M	19			(81) 832-9095
A.A. Marais	M	61	Manager	farywilla@iafrica.oow,na	(81) 685-3317
D. Bantam	F	63	Community Member		(81) 349-8505
Isak April	M				

Lucia Frederik	F	35			(81) 838-3518
Magdelena Swartbooi	F	41			(81) 354-1421
Morne Christiaan	F	23	Unemployed	shadeychristiaan60@gmail.com	(81) 740-8934
Annalise Windstaan	F	22		ashleeash65@gmail.com	(81) 730-3390
Wilhelmina Cooper	F		Unemployed		(81) 370-7268
Benadna Plaitjies	F	26	Unemployed		(81) 589-4379
Lorna Swartbooi	F				(81) 356-7429
Zilke Swartbooi	F		Unemployed	bewerley@gmai.com	(81) 592-8641
Bonaventura Swartbooi	F		Unemployed		(81) 392-4633
Roberto Keister	M	20	Auto Machanic		(81) 694-5015
Merril Jossop	M	31	Health Ass. Worker	naasjossop@gmail.com	(81) 217-1335
Helly Christiaan	M				(81) 844-1089
Sieglinda Ortman	F	18			(81) 870-5063
Dorothea Meintjies	F	63	Pensioner		(81) 209-3391
Annamarie Hartbees	F	46	Unemployed		
Janjie Christiaan	M	25	Auto mechanic		(81) 479-4716
Jacqueline Witbooi	F	25	Unemployed		(81) 870-5097
Mary-Jane Jossob	F	27			(81) 682-6659
Lena Swartbooi	F	54	Unemployed		(81) 206-2043
Elizabeth Christiaan	F	33	P.O. Clerk		(81) 589-9885
Windson Christiaan	M	29	Unemployed		(51) 640-4238
Friedrich A. Alter	M	35	SAO	Grünausettlement@gmail.co,	(81) 748-0198
Jim Christiaan	M	54	SDC Member		(81) 848-2105
Frederik Meintjies	M	29	SDC Member		(81) 861-0747
J.P Marium	M	46	SDC Member	Grünausettlement@gmail.co,	(81) 609-7973
D. Bantam	M	63	SDC Member		(81) 349-8505
Amanda Christiaan	F	37	SDC Member		(81) 698-1571
Moses Pieters	M	43	SDC Member		(81) 406-6749
Christina E.L Gevoses	F	51	Hostel Matron		081 202 5789
Maria Christiaan	F	54	Hostel Co-worker		081 644 8245
Glenton Jossop	M	20		glentonjossop@gmail.com	081 838 498
Brendon Swartbooi	M	24			081635 2930
Jacques Christiaan	M	23			081 837 3414

Appendix F – Survey data

Name and Surname	Village / Dorpnaam	Gender / Geslag	Disabled / Gestremd	Age / Ouderdom	Employment status / Werkstatus	Where do you get your drinking water from / Waar kry jy jou drinkwater vandaan?	How far do you travel to get water? / Hoe ver moet jy reis om water te kry?	Do you pay for your drink water? / Betaal jy vir jou drinkwater?	How much do you pay per month? / Hoeveel betaal jy per maand?	Is the water expensive? / Is die water duur?	Is the water supply reliable? / Is die waterbron betroubaar?	What is the quality of your drinking water? / Wat is die kwaliteit van jou drinkwater?	What impact / influence does the quality and availability of water have on your life? E.g. Health and safety impacts, financial, gender vulnerability, etc. / Watse impak / invloed het die kwaliteit en beskikbaarheid van water op jou lewe? Bv. Gesondheids- en veiligheidsimpak, finansiële, geslags, kwesbaarheid, ens.
Sieglinda Ortman	Grünau	Female	No	18	Employed	NamWater	In the Yard	No	0	No	Yes	Acceptable	She wants her own tank for water storage, she wants to start a small vegetable patch
Entrli Jaartze	Grünau	Male	No	19	Unemployed	NamWater	In the Yard	Yes	1		Yes	Acceptable	The use of water is acceptable
Roberto Keister	Grünau	Male	No	20	Unemployed	NamWater	In the Yard	Yes	1	Yes	Yes	Acceptable	Poor water quality and have negative impact on their health
Glenton Jossop	Grünau	Male	No	20	Unemployed	NamWater	100 M	Yes	40	No	Yes	Acceptable	
Annalise Windstaan	Grünau	Female	No	22	Unemployed	NamWater	10km	Yes	45	Yes	Yes	Acceptable	Sometimes the water gives diarrhoea to the kids
Sara Fredericks	Grünau	Female	No	22	Employed	NamWater	In the Yard	Yes	98.4	Yes	Yes	Acceptable	Health, Sometimes diarrhoea
Lorna Swartbooi	Grünau	Female	No	23	Employed	NamWater	In the Yard	Yes	98.4	Yes	No	Acceptable	Coming back to Grünau after being away, gives diarrhoea especially to the children.
Morne Christiaan	Grünau	Female	No	23	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	Yes	Acceptable	
Christiaan Jacques	Grünau	Male		23	Unemployed	NamWater	In the Yard	Yes	98.4	No	Yes	Acceptable	
Brendon Swartbooi	Grünau	Male		24	Employed	NamWater	In the Yard	Yes	100	Yes	Yes	Acceptable	Sometimes it gives diarrhoea
Charlotta Roos	Grünau	Female	No	25	Employed	NamWater	In the Yard	Yes	500	Yes	No	Acceptable	Chlorine index to high
Jantjie Christiaan	Grünau	Male	No	25	Unemployed	NamWater	In the Yard	Yes	500	Yes	No	Acceptable	Quality of water has thus far no negative impact on his life. Water is very expensive. Needs more water to wash clothes, water trees. food and hygiene.
Benadna Plaitjies	Grünau	Female	No	26	Unemployed	NamWater	In the Yard	Yes	1000	Yes	No	Acceptable	The quality of water seems to be acceptable, but community doesn't know whether the water is good to their health. They don't know which water purification chemicals harmless to human health.
Mary-Jane Esme Jossob	Grünau	Female	No	27	Employed	NamWater	In the Yard	Yes	50- 100	No	Yes	Acceptable	Sometimes the water gives diarrhoea
Benarentura M Swartbooi	Grünau	Female	No	27	Unemployed	NamWater	In the Yard	Yes	400- 600	Yes	No	Good	Unemployment
Zilke Swartbooi	Grünau	Female	No	28	Unemployed	NamWater	30m	Yes	50	Yes	Yes	Poor	Pit toilets,
Jacqueline Witbooi	Grünau	Female	No	29	Unemployed	NamWater	In the Yard	Yes	64	Yes	No	Poor	The availability of water for few hours per day impact household negatively. The proposed project will help community to have access of running water throughout the day.
Wilson Christiaan	Grünau	Male		29	Unemployed	NamWater	In the Yard	Yes	98	Yes	No	Poor	Chlorine in water is too high, needs to replace kettles and pans 3 -5 times a year, needs to carry water to toilets. Sometimes the water gives more diarrhoea because of higher chlorine index
Wihelmina Cooper	Grünau	Female	No	31	Unemployed		In the Yard	Yes	98.4		Yes	Poor	Only water for one hour, pit toilets, health
Merril Jossop	Grünau	Male	No	31	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	No	Poor	Water is only turned on for an hour per day. Needs to accumulate water for following days
Helly Christiaan	Grünau	Male	No	31	Employed	Local Authority	In the Yard	Yes	98.4	No	No	Poor	Gives diarrhoea, but he says he has adapted. The kettle needs replacement every 3 months because of chlorine residue.
Elizabeth Christiaan	Grünau	Female	No	33	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	No	Poor	Water in town Impacts their skin negatively (Dark skin) 2). Cause diarrheal to children. 3). Brown Teeth. 4). Decreased ability to taste certain types of foods
Lucia Frederik	Grünau	Female	No	35	Employed	NamWater	In the Yard	Yes	110		No	Poor	Cannot sustain a garden; Pit toilets
Admin Meintjies	Grünau	Male	No	35	Employed	NamWater	In the Yard	Yes	200	Yes	No	Poor	1). The availability of water for few hours per day impact household negatively. 2). Impacts their health because people don't wash their hands and food properly. 3). Community members consume contaminated water
Anna Marie Pieters	Grünau	Female	No	40	Unemployed	NamWater	5 KM	Yes	500	Yes	No	Poor	
Magdalena M Swartsoor	Grünau	Female	No	41	Unemployed	NamWater	500 M	Yes	500	Yes	No	Poor	Prepaid water negatively impact household finances on daily water use and on laundry
Maureen Swartbooi	Grünau	Female	No	42	Unemployed	Other	5km	Yes	1000 - 1500	Yes	No	Poor	Water is not adequate for washing, water differs from enamouring water
Anne-Marie Windstaan	Grünau	Female	No	43	Unemployed	NamWater	In the Yard	Yes	400 -600	Yes	No	Poor	Health and Financial
Johannes Petrus Markus	Grünau	Male	No	46	Unemployed	NamWater	2 KM	Yes	1	Yes	Yes	Very good	Poor water quality caused by community members

Anna Marie Hartbees	Grünau	Female	No	47	Unemployed	Local Authority	In the Yard	Yes	50	Yes	Yes	Very good	Health because of 'brak water' Affects are seen mostly in childen, causes diarrhoea. No immediate doctor, needs to travel to Karasburg. Unemployment
Helniuth Gauseb	Grünau	Male	No	50	Employed	NamWater	In the Yard	Yes	50	Yes	No	Very poor	Keten kaak, Health
Christina E.L Gaoses	Grünau	Female	No	51	Unemployed	NamWater	500 M	Yes	50	Yes	No	Very poor	The unavailability of water forces community to use the same water repeatedly for 4-5 days from one container which could be contaminated
Maria Christiaan	Grünau	Female	No	54	Unemployed	NamWater	800 M	Yes	50	Yes	No	Very poor	
Loena Swartoea	Grünau	Female	No	54	Employed	NamWater	In the Yard	Yes	98	Yes	No	Very poor	Too much chloride harmful to teeth; Negatively impacts financially caused by high chloride which damage electrical appliances and must be replaced every second month of purchase. Household should own water tank which is expensive and is hazardous to fetch water outside at night. Households don't know level of health impact causes by chloride.
Doulinicus L Murphy	Grünau	Male	No	59	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	Yes	Very poor	She thinks that more water usages could lead to more opportunities (like a garden)
Niklaas Christiaan	Grünau	Male	No	59	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	No	Very poor	Health, only one hour of water, pit toilet
AA Marais	Grünau	Male	No	61	Employed	NamWater	In the Yard	Yes	98.4	Yes	No	Very poor	Needs to replace kettles. they have a flush toilet, but they still need to carry water into the house. They do not have tanks.
Sara April	Grünau	Female	No	62	Employed	NamWater	In the Yard	Yes	98.4	Yes	No	Very poor	Health risk, diarrhoea, water is expensive, no toilets at house
Borothea Meintjies	Grünau	Female	Yes	63	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	No	Very poor	Water holds a major risk towards her health, causes diarrhoea and give brown teeth, financial pressure because of unemployment
Daniel Bantam	Grünau	Male	No	63	Unemployed	NamWater	In the Yard	Yes	98.4	Yes	No	Very poor	Health risk, chlorine residue in kettles, no water for toilets, diarrhoea or vomit because of higher chlorine index
Isak April	Grünau	Male	No	64	Unemployed	NamWater	3 Km	Yes	300	Yes	Yes	Very poor	Scarce water in area force household to use water repeatedly for 4-5 days from one container which could be contaminated
Dorothae Rooi	Grünau	Female	No	65	Employed	Local Authority	3km	Yes	470	Yes	No	Very poor	Water causes diarrhoea, unemployment, financial, pit toilets - wants flush toilets please

Appendix G – Grievance Mechanism

Document control record

Document prepared by:

Aurecon South Africa (Pty) Ltd

Reg No 1977/003711/07

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Contents

Appendices

Figures

Abbreviations

ACHM	Ad Hoc Complaint Handling Mechanism
BID	Background Information Documents
CBO	Community Based Organisation
CDC	Community Development Committee
CEO	Chief Executive Officer
CMHC	Counselling and Mental Health Centre
DRFN	Desert Research Foundation of Namibia
EE	Executing entity
ESIA	Environmental, social, and gender assessment
ESMP	Environmental and social management plans
ESMS	Environmental and Social Management System
HIV/ AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HR	Human resources
IFC	International Finance Corporation
IPPR	Institute for Public Policy Research
NamWater	Namibia Water Corporation Ltd
NCPE	National Commission for the Promotion of Equality
NIE	National implementing entity
NGO	Non-governmental organisation
PFG	Project Formulation Grant
PS	Performance standard
STI's	Sexually transmitted diseases
TB	Tuberculosis
UNDP	United Nations Development Programme

1 Provisions for redress of grievances

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities.

The Adaptation Fund (Fund) makes the ACHM available to Implementing Entities and members of the communities that are adversely affected by the implementation of project / programmes funded by the Fund. The purpose of the ACHM is to assist in responding to complaints raised against project / programmes funded by the Fund through a participatory approach.

Complainants and implementing entities should use the implementing entity's grievance mechanism as a first step. However, the ACHM can be used in cases where the Parties have failed to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year. The ACHM requires a written submission of a complaint by at least one of the Parties.

The Adaptation Fund Board secretariat (secretariat) will independently manage all aspects related to complaint handling, under the oversight of the Ethics and Finance Committee (EFC) of the Adaptation Fund Board (Board).

The ACHM builds on alternative dispute resolution techniques. Main features of the ACHM are to effectively facilitate dialogue among stakeholders, mediate/assist in resolving issues raised, and develop and share lessons to improve future operations.

Adaptation Fund
Ad Hoc Complaint Handling Mechanism (ACHM)

Grievance mechanisms are an important part of IFC's approach to requirements related to community engagement by clients under the Policy and Performance Standards on Social and Environmental Sustainability. Where it is anticipated that a new project or existing company operations will involve ongoing risk and adverse impacts on surrounding communities, the client will be required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the client's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies. The client will inform the affected communities about the mechanism in the course of its community engagement process (PS 1, Paragraph 23).

A grievance mechanism should be able to deal with most of the community issues that are covered by IFC's Performance Standards. Grievance mechanism requirements in relation to affected communities are explicitly stated with regard to security personnel (PS 4, Paragraph 13), land acquisition (PS 5, Paragraph 10), and adverse impacts on indigenous peoples (PS 7, Paragraph 9). The contractor will be asked to design the mechanism according to the extent of risks and adverse impacts of the project. Impacts on communities are evaluated within the Social and Environmental Assessment for a project.

Grievance mechanisms inform and complement but do not replace other forms of stakeholder engagement. Stakeholder engagement also includes stakeholder identification and analysis, information disclosure, stakeholder consultation, negotiations and partnerships, stakeholder involvement in project monitoring, and reporting to stakeholders. If strategically applied throughout the project life, an integrated range of stakeholder-engagement approaches can help build trust, contribute to maintaining broad community support for the project, and ultimately help companies promote the long-term viability of their investments.

1.1 What is grievance

The Good Practice Note[1] defines a grievance as a concern or complaint raised by an individual or a group within communities affected by project construction and company operations. Both concerns and complaints can result from either real or perceived impacts, and may be filed in the same manner and handled with the same procedure. The difference between responses to a concern or to a complaint may be in the specific approaches and the amount of time needed to resolve it. The term 'grievance' implies that there may be a problem. In practice, however, the nature of feedback that communities may want to bring to a contractor's attention will vary, since communities often find it appropriate to use the same channels to communicate not only grievances but also questions, requests for information, and suggestions. Communities may even use these channels to convey what they think the company/contractor is doing well.

The client should keep in mind that unanswered questions or ignored requests for information have the potential to become problems and should, therefore, be addressed promptly. It is good practice to respond to community feedback through the relevant pillars of community engagement, such as disclosure, consultation, and participation in project monitoring. For example, a question about specific benefits the project provides or intends to provide to women in the community can be forwarded to a community liaison or a staff member who specifically deals with gender matters, if such person has been appointed by the project. The person(s) who asked this question are then notified as to who will respond and by when.

1.2 Project-level grievance mechanism

A project-level grievance mechanism for affected communities is a process for receiving, evaluating, and addressing project-related grievances from affected communities at the level of the company, or project. In the context of this projects, this mechanism may also address grievances against contractors and subcontractors. Project-level grievance mechanisms offer companies/contractors and affected communities an alternative to external dispute resolution processes (legal or administrative systems or other public or civic mechanisms). These grievance mechanisms differ from other forms of dispute resolution in that they offer the advantage of a locally based, simplified, and mutually beneficial way to settle issues within the framework of the contractor–

[1] IFC Good Practice Note: Addressing Grievances from Project Affected Communities. 2009. Available from available at http://www.ifc.org/ifcext/sustainability.nsf/Content/Publications_GoodPractice. Accessed on 18th August 2014.

community relationship, while recognising the right of complainants to take their grievances to a formal dispute body or other external dispute-resolution mechanisms.

It should be noted, however, that complex issues that arise from high environmental and social impacts are seldom resolved in a relatively simple way. In such cases, projects should anticipate involvement of various third parties in the resolution process to achieve solutions with affected communities. These include, but are not limited to, various national and international mediation bodies, independent mediators and facilitators with sector- and country-specific expertise, and independent accountability mechanisms of public sector financiers.

> ***Keep your grievance mechanism operational.***
> *Once the construction period is over, the project is likely to experience a decrease in the number of complaints. This may be because the issues previously raised have now been resolved, or because the "moment of maximum impact" has passed. While this might mean that a company can scale down the level of resources it was devoting to the day-to-day management of grievances, there should always be a well-functioning procedure for receiving and addressing public concerns whenever they may arise throughout the life of the project.*
> *IFC*

2 Approach to grievance redress

2.1 Local community grievance procedure structure

The grievance procedure currently utilised by the Bethanie, Grünau and Epukiro communities are that the grievances go through the Local Village Council and the Community Development Committee (CDC). The CDC is made up of representatives from:

- The Local Council;
- Churches;
- Schools;
- NamWater;
- NamPower;
- Elders;
- Youth; and
- Business owners.

The CDC is not as active as it could be and it is recommended that this committee be revived and revised to be able to be the contact point between the project and the local community, and handle all grievances. The community indicated that this is the way they would prefer grievances to be handled. They also stipulated that dates must be set for CDC meetings so that continuous communication between the project and the community can be a reality.

2.2 National implementing entity (NIE) - DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities. Please see the Ad Hoc Complaint Handling Mechanism (ACHM) as approved in October 2016 in Appendix A.

2.3 Executing entity (EE) - NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)
- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments
- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation. Please see the NamWater Grievance Handling in Appendix B.

2.4 Grievance mechanisms needed for projects implemented

Although a company generally differentiates between the actions of its own employees and those of contractors and subcontractors, local communities tend to see no difference and will attribute actions of contractors and subcontractors to the company. This is the case even if contractors are in the country only for a short period of time.

Companies need to anticipate grievances that may arise from the actions of suppliers or contractors, and implement a policy and management tools, such as regular monitoring to govern their behavior and actions, including provisions for coordinated management of grievances and key indicators that help evaluate the effectiveness of contractors' policies and tools. Where there are a small number of contractors, it may be feasible for the contractors to establish and manage their own grievance mechanisms. Companies will need to make sure that these mechanisms do not conflict with the company mechanism or those of the other contractors by establishing clear guidelines and ensuring oversight. Where contractual relationships are more complex or numerous, companies may wish to have all grievances directed to the company's mechanism, regardless of whether they relate to the company or its contractors or subcontractors.

Handling grievances encompasses a step-by-step process as well as assigned responsibilities for their proper completion. Figure 1 below provides **procedure on how grievance** should be received, registered and tracked. Contractors establishing grievance mechanisms will follow the process steps discussed in this section.

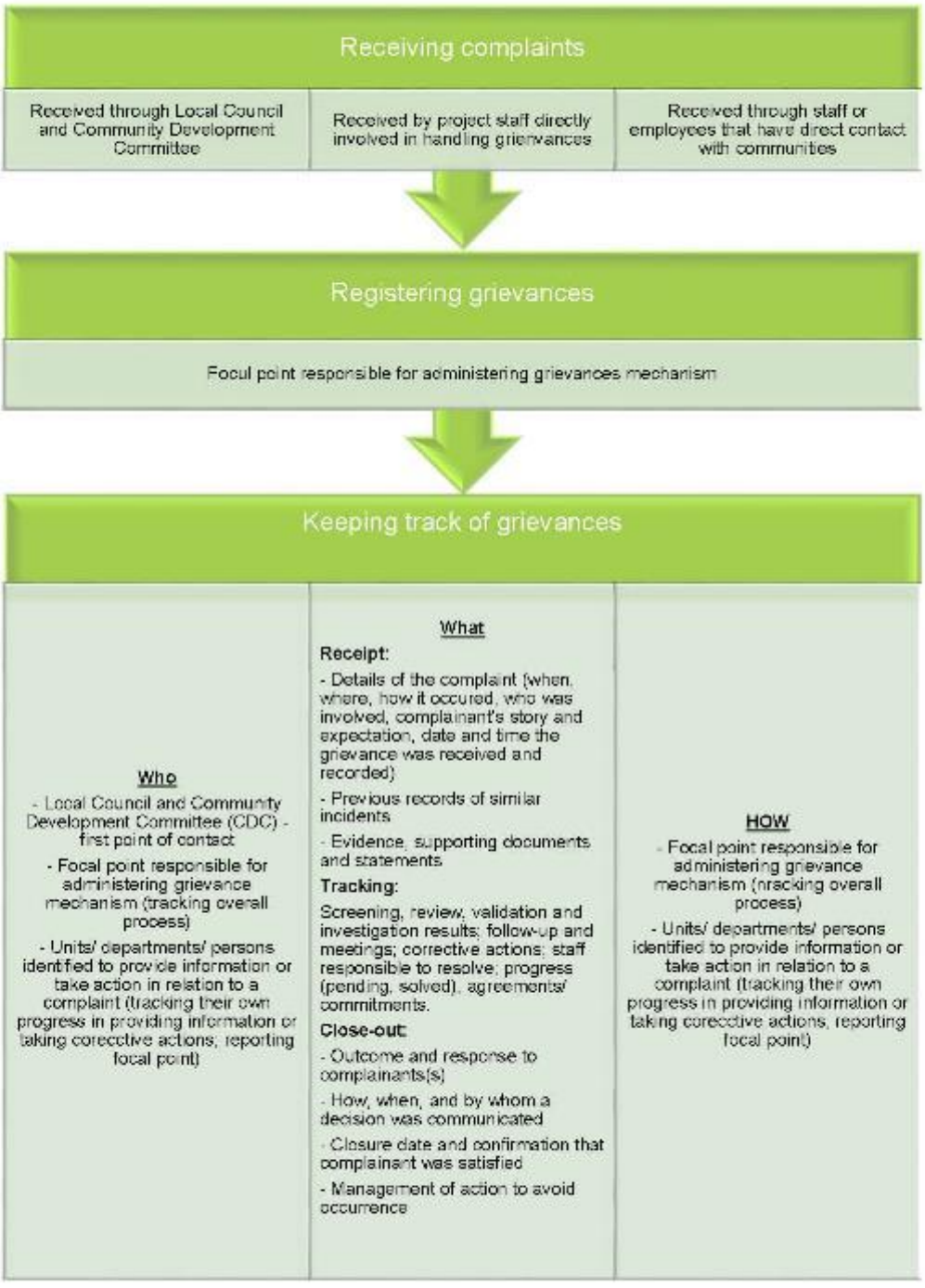

Figure 1: Receipt, registration and tracking of grievances

2.5 Step 1: Publicising grievance management procedures

When and how the grievance mechanism is introduced to affected communities can have significant implications for its effectiveness over time. Guiding principles for publicising a grievance mechanism should be in line with cultural characteristics and accessibility factors of affected communities. The information should include at least the following:

- What project-level mechanisms are (and are not) capable of delivering and what benefits complainants can receive from using the contractor's grievance mechanism, as opposed to other resolution mechanisms;
- Who can raise complaints (affected communities)
- Where, when, and how community members can file complaints;
- Who is responsible for receiving and responding to complaints, and any external parties that can take complaints from communities;
- What sort of response complainants can expect from the contractor, including timing of response; and
- What other rights and protection are guaranteed. Ideally, as part of their first interactions with company representatives, communities should be informed of a contractor's intention to establish a grievance mechanism, and continue to be reminded of this mechanism on a regular basis during project implementation. Contractors should emphasize the objectives of the grievance system and the issues it is designed to address. A contractor's community liaison officers, grievance officers, or individuals working in analogous positions, should be responsible for publicising the procedure through appropriate methods.

2.6 Step 2: Receiving and keeping track of grievances

Once communities are aware of the mechanism and access it to raise grievances, the contractor needs to process them. Processing includes:

- Collecting grievances;
- Recording grievances as they come in;
- Registering them in a central place; and
- Tracking them throughout the processing cycle to reflect their status and important details.

2.6.1 Receiving concerns and complaints

Below are simple rules that any receipt procedure for grievances should follow:

- All incoming grievances should be acknowledged as soon as possible. A formal confirmation with a complaint number, or other identifier, and a timeline for response assures the complainant that the organisation is responding properly, and it gives the project a record of the allegation. If a complaint is received in person, a good practice is to acknowledge it on the spot.

- If a more complex investigation is required, the complainant should receive an update explaining the actions required to resolve the complaint, and the likely timeline.
- The contractor should explain up front what claims clearly are outside the scope of the mechanism and what alternative avenues communities can use to address these potential issues.

2.6.2 Step 3: Reviewing and investigating grievances

For a grievance mechanism to work, all complaints should be handled as promptly as possible, depending on the nature and complexity of the matter. The central unit or person responsible for grievance handling should organise the process to validate the complaint's legitimacy and arrange for investigation of details. Depending on the circumstances of the complaint, various units or departments may need to get involved, including senior management if their direction and decision is required by the established procedures and division of responsibilities. To begin this process, establish the nature of the grievance to determine the measures needed for review and investigation. All grievances will need to undergo some degree of review and investigation, depending on the type of grievance and clarity of circumstances. For example: Minor, straightforward issues may only need screening before proceeding to the next step (resolution options and response). Review of minor issues, especially those related to a complainant's request for information, can generally be handled easily by providing information on the spot, or referring the person to community liaison personnel. If there is any possibility that deeper underlying issues may exist, always take time to look into the complaint further.

Less clear, more problematic, or repetitive issues, or group complaints may need a more detailed review prior to action. Staff involved in handling grievances may need to seek advice internally, and in some cases turn to outside parties to help in the validation process, especially in cases of damage claims. One option to help determine legitimacy is an internal committee comprising staff who will be involved in the operation, staff involved in supervision of the grievance mechanism, and managers from the project departments whose activities are likely to result in claims. For example, the committee might consist a community liaison officer and an operations manager. This committee can also provide initial recommendations on resolution options.

2.6.3 Where an extensive investigation is required

An extensive investigation may be required when grievances are complex or widespread and cannot be resolved quickly. As a way to conform to the principle of "no cost to communities," the contractor should take full responsibility for investigating the details of grievances coming through its grievance mechanism. However, in cases of sensitive grievances such as those involving multiple interests and a large number of affected people, it may help to engage outside organisations in a joint investigation, or allow for participation by Community Development Committee, civil society organizations or NGOs, or local authorities, if the complainants agree to this approach.

For controversial projects, consider establishing an independent monitoring panel.
In some cases, where a project is particularly complex or controversial for instance, an independent monitoring panel may be useful for maximum objectivity and transparency. This panel, which might include stakeholder representatives, internationally recognized experts, and eminent persons, can oversee and report on the project's environmental and social performance
IFC

2.6.4 Step 4: Developing resolution options and preparing a response

Once the grievance is well understood, resolution options can be developed taking into consideration community preferences, project policy, past experience, current issues, and potential outcomes. The following approach is proposed:

- A risk-based assessment of potential grievances disputes or conflicts that may arise during project preparation and implementation;
- Identification of the client s existing capacity for grievance redress; and
- An action plan that identifies priority areas for strengthening grievance capacity, or if necessary, establishing new mechanisms at the project level. Where applicable, dedicated resources should be allocated for realisation of the action plan

Developing resolutions options commensurate with the nature of the grievance

General approaches to grievance resolution may include proposing a solution:

- Unilaterally (the contractor proposes a solution);
- Bilaterally (the contractor and the complainant reach a resolution through discussion or negotiation);
- Through a third party (either informally or formally through mediation); or
- Through traditional and customary practices.

One of the potential advantages of a grievance mechanism is its flexibility. Rather than prescribe a specific procedure for each particular type of complaint, it may be helpful to establish a "menu" of possible options appropriate for different types of grievances, so that contractor personnel and community members have models for action when a dispute arises. Options include altering or halting harmful activities or restricting their timing and scope, providing monetary compensation, providing an apology, replacing lost property, revising community engagement strategy, and renegotiating existing commitments

Preparing and communicating clear response

Regardless of the outcome, a response should be provided to all complainants. Responses can be either oral or written, depending on whether the grievance was received orally or in writing. At the time of first interaction between the contractor representative and complainant(s), there are two possible scenarios:

The claim is rejected and no further action will be taken. If a claim is rejected upfront, it is either ineligible or clearly does not have a basis. If the response is that the grievance does not require action by the contractor to resolve it, all considerations should be documented and included in both the response and the contractor systems for grievance tracking for further reference. Contractors should be diplomatic when telling community members that no further action will be taken, since they are likely to be disappointed. But including a detailed and respectful explanation, together with compelling evidence of why it cannot be accepted, usually keeps a conflict from escalating. The claim is accepted. The response procedure would include two general steps:

1. A preliminary response should be provided within a stipulated period of time and should propose the next steps and actions to be taken for resolution. Let complainants know the results of the assessment and the status of their claims, and encourage and invite further discussion with complainants (to obtain additional arguments, collect more evidence, conduct further investigation, and launch a dialogue). If complainants are not likely to be satisfied with the outcome the contractor is considering, schedule group or individual meetings, as needed, to discuss the findings and further clarify the position of the contractor and of the complainants; and, in more complex cases, have management participate in such meetings, since they are perceived to be the legitimate decision makers.

2. A final response should be given to document the final proposed resolution. Communicate the proposal, stipulate mutual commitments, and ask for the complainants' agreement. If the complainants are not satisfied with the proposed resolution, or the outcome of the agreed corrective actions, they should be free to take their grievances to a dispute resolution mechanism outside of the contractor grievance mechanism.

Close out cases only when an agreement with complainants is reached

Following completion of the agreed-upon corrective actions, it is a good practice to collect proof that those actions have taken place. For example:

- Take photos or collect other documentary evidence to form a comprehensive record of the grievance and how it was resolved;
- Create a record of resolution internally, with the date and time it took place, and have responsible staff sign off;
- Have a meeting with the complainants to get a collective agreement to close out the claim; and
- If the issue was resolved to the satisfaction of the complainants, get a confirmation and file it along with the case documentation.

2.6.5 Step 5: Monitoring, reporting, and evaluating a grievance mechanism

Monitoring and reporting can be tools for measuring the effectiveness of the grievance mechanism and the efficient use of resources, and for determining broad trends and recurring problems so they can be resolved proactively before they become points of contention. Monitoring helps identify common or recurrent claims that may require structural solutions or a policy change, and it enables the contractor to capture any lessons learned in addressing grievances. Monitoring and reporting also create a base level of information that can be used by the contractor to report back to communities. Although internal monitoring is usually sufficient for smaller projects, in the case of projects with significant impacts, or where the facts surrounding the grievance are contentious, monitoring by a neutral third party can enhance the credibility of the grievance mechanism.

Tracking grievance statistics to ascertain effectiveness

Depending on the extent of project impacts and the volume of grievances, monitoring measures can be as simple as tracking the number of grievances received and resolved, or as complex as involving independent third-party evaluations. Apart from reviewing each grievance and analysing effectiveness and efficiency, companies also can use complaints to analyse systemic deficiencies. Grievance records should provide the background information for regular monitoring, both informal and formal. Therefore, even a simple tracking system should provide an opportunity to aggregate information and recognise patterns in the grievances the contractor receives, and how they are being resolved.

Adapting the mechanism to correct effectiveness

The final objective of monitoring is to ensure that the design and implementation of the grievance mechanism adequately respond to the stakeholders' needs in a cost-effective manner.

To maintain the mechanism's effectiveness, the contractor must design the mechanism and assign responsibilities to allow for policies and practices to improve efficiencies in the receipt and resolution of grievances. These objectives can be met only through ongoing adjustments to the mechanism, facilitated by support from the management. For example:

- If communities strongly prefer one of several channels offered to submit grievances, focus contractor resources on that channel to lower the costs of methods that communities do not use;
- If only one subgroup in the community raises complaints (for example, women, elderly), determine whether this phenomenon is the result of a particularly high impact of operations on that specific group or an accessibility issue;
- If a large number of grievances do not get resolved through the mechanism, a major change may be required in how the contractor approaches resolution, rather than focusing efforts on resolving individual issues; and

- If the grievances allege that the mechanism lacks transparency, adjust the policy and methods used to publicise it, put more emphasis on inviting the community to participate in decision making through the grievance mechanism, and consider involving third parties.

Using monitoring results to report back

Lessons learned throughout the process of handling grievances can help ensure continual improvement of the contractor's operations. The contractor can also use monitoring to report back to the community on its implementation of the mechanism. In addition, the contractor can designate personnel responsible for translating lessons learned from its monitoring into concrete policy and practice changes for the contractor. A community meeting to explain the results of such reports is also effective, and may lead to a mutually respectful relationship between the contractor and the community.

3 Resources needed to manage a grievance mechanism

3.1 Resources for grievance mechanisms

Grievance mechanisms will be effective if adequate resources; people, systems and processes, and associated financial resources are assigned to implementation, and if responsibilities are clearly defined. Grievance management should be recognised as a business function with clearly defined objectives, assigned responsibilities, timelines, budget, senior management oversight, and regular reporting. For these reasons, grievance mechanisms should be placed within a larger context of a social and environmental management system and should serve as one of the indicators of whether the system is functioning properly. The ultimate responsibility for designing, implementing, and monitoring project-level grievance mechanisms should lie with senior management.

3.2 Who should be responsible for implementation?

For a grievance mechanism to function effectively, it is important to determine a governance structure and assign responsibilities for the mechanism's implementation. The following basic preparations should be taken into account when evaluating resources and allocating responsibilities for grievance mechanism implementation:

- Make sure that the role of senior management is clear, i.e. in what cases and at what stage in the handling of a complaint their decision will be required, and who will be responsible for strategic oversight of grievance management. Senior management has final authority to ensure that commitments to affected communities are met, and clear reporting lines must be established between senior management and those implementing the grievance mechanism.

- Identify personnel or a unit responsible for administering the grievance mechanism (recording complaints, arranging for collection of additional information, consulting relevant departments or persons within the organization, tracking progress, aggregating and forwarding feedback to complainants, reporting). It may be a new or existing unit or person within an organization. Who is best suited to handle these tasks is sometimes determined by the nature of community grievances. Community liaison or an administrative assistant should serve as an entry point to receive and log complaints. Frequent turnover of staff assigned to grievance handling and community liaison can adversely impact the perception of the mechanism.
- It should be noted that other community engagement tasks do not take the place of handling grievances, particularly if a community liaison officer is also assigned to handle the grievance process.
- Where possible, functions of grievances handling should be separated from project management, and assign clear accountability for each, so as to avoid decisions that favour the interest of the contractor only. Safeguards can include clearly defining the authority and decision-making responsibilities of people involved in administering the grievance mechanism, as well as making sure that senior management is ready to intervene. These would include responsibilities for managing the overall process, as well as separate steps (receipt, recording and tracking, investigating, and responding).

3.3 Involving third parties

Third parties such as non-governmental organisations, community-based organisations, local governments, local community and religious organisations and traditional councils can sometimes be involved in companies' grievance mechanisms. They can serve as process organisers, places to bring a complaint to be passed on to the contractor, or as facilitators, witnesses, advisors, or mediators. In some cases, it may be beneficial to place part of the responsibility for the process on external entities, formed within the communities themselves or acceptable to them while the contractor maintains ultimate responsibility and accountability for the process. Third parties can help increase the level of trust from communities as well as overcome certain limitations of project-level mechanisms, such as lack of transparency, insufficient contractor resources, possible conflict of interest, and biases, provided that they themselves are perceived to be unbiased and impartial relative to both the contractor and the communities. It is recommended that the Local councils and Community Development Committees be the first point of contact.

3.4 Options for third party engagement

To have an effective project-level grievance mechanism, companies need to understand the roles of third parties before engaging them. For example:

Community self-governance structures (such as village councils, tribal councils). These should be taken into account when developing a grievance mechanism to ensure cultural appropriateness, community involvement in decision making, and efficient and effective use of existing community resources.

Local NGOs, CBOs - Identify those that are active in the area of project or company operations, learn about their interactions with the affected communities, determine what contribution they can make to effective resolution, and discuss options for an NGO to administer the project's grievance mechanism or a part thereof. Sometimes NGOs can also represent local communities and help them build their capacity to understand the process and its benefits, participate in decision making, and articulate grievances and bring them to the attention of companies. Such organizations can be viewed as a voice of communities, and companies should be prepared to deal with grievances brought by NGOs on behalf of communities.

Local government authorities. Communities sometimes bring their project-related complaints to local governments. It would be advisable for the contractor to consider partnering with local authorities to facilitate receipt of grievances from communities. Local governments can also be a resource to help companies resolve complaints, since local authorities may have an established relationship with the communities. They can participate as third parties and advisors in contractor-initiated resolution processes.

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Bringing ideas to life

Appendix H - AF Ad Hoc Complaint Handling Mechanism (ACHM)

ADAPTATION FUND

7 October 2016

Adaptation Fund Board

AD HOC COMPLAINT HANDLING MECHANISM (ACHM)

(APPROVED IN OCTOBER 2016)

Ad Hoc Complaint Handling Mechanism (ACHM)

What is the ACHM?

1. The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities.

2. The Adaptation Fund (Fund) makes the ACHM available to Implementing Entities and members of the communities that are adversely affected by the implementation of project/programmes funded by the Fund. The purpose of the ACHM is to assist in responding to complaints raised against project/programmes funded by the Fund through a participatory approach.

3. Complainants and implementing entities should use the implementing entity's grievance mechanism as a first step. However, the ACHM can be used in cases where the Parties have failed to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year. The ACHM requires a written submission of a complaint by at least one of the Parties.

4. The Adaptation Fund Board secretariat (secretariat) will independently manage all aspects related to complaint handling, under the oversight of the Ethics and Finance Committee (EFC) of the Adaptation Fund Board (Board).[1]

5. The ACHM builds on alternative dispute resolution techniques.[2] Main features of the ACHM are to effectively facilitate dialogue among stakeholders, mediate/assist in resolving issues raised, and develop and share lessons to improve future operations.

How does it function?

6. **Receipt:** Within ***5 business-days*** of receiving a complaint, after determining whether the complaint is not excluded from the process as per below, the Manager of the secretariat informs the Parties of the receipt of the complaint.

7. In the course of information sharing between the Parties, the secretariat ensures that names and other identifiers are redacted if confidentiality is requested.

[1] See Adaptation Fund risk management framework, *available at* https://www.adaptation-fund.org/documents-publications/operational-policies-guidelines/.

[2] These include facilitation, mediation, cooperative or interest-based problem-solving, neutral evaluation, joint fact-finding, negotiation, conciliation, arbitration etc.

8. **Assessment and Agreement:** The secretariat, based on consultations with the Parties prepares a draft assessment report laying out the concerns and expectations of the Parties within ***20 business-days***. The Parties can provide comments to this report within ***10 business-days***.

9. The secretariat incorporates relevant comments into a public Final Assessment Report, annexing the Parties' comments and the complaint. The secretariat will design and include, in consultation with the Parties and based on their good faith, an agreed upon strategy towards the mutual understanding of the issues (confirming or dispelling complaints) and potential acceptable ways forward in order to reach solutions. The strategy will be based on alternative dispute resolution techniques. The Final Assessment Report is submitted to the EFC, which will make a recommendation for approval by the Board, as per the Fund's risk management framework.

10. **Non-objection by EFC on the Final Assessment Report:** The secretariat confirms that the agreement of the Parties is included in the Report. The secretariat then promptly circulates this report to the EFC by email and seeks their absence of objection within ***14 business-days***. If the objection is raised, the secretariat informs the Parties that the secretariat will cease all dispute resolution activities with regard to such complaint.

11. In case the non-objection is provided, the secretariat in consultation with the Parties and their participation implements the strategy. Relevant trust building measures or dispute resolution activities can be based on specific issues raised, or grouping of issues, addressing them independently one from the other, or holistically covering all aspects of the complaint.

12. **Implementation and Monitoring:** The ACHM requires trust building measures, and continued good faith engagement. Hence, it cannot be time bound. The secretariat will prepare and submit the update reports on the implementation of the agreed-upon dispute resolution strategy proposed in the Final Assessment Report. The Update Reports are submitted to the EFC. The cost for ACHM activities is covered by the Fund.

13. The ACHM is not a guarantee to achieving resolution. If within two Update Reports the ACHM was not able to implement any activity part of the dispute resolution strategy, the Manager of the Fund's secretariat in consultation with the EFC Chair may decide to suspend or terminate the dispute resolution activities.

14. In case the dispute resolution activities are suspended, the secretariat informs the Parties that the ACHM will temporarily cease with regard to such complaint and the reasons behind the suspension.

15. The Manager of the secretariat in consultation with the Parties revisits the decision to suspend dispute resolution activities on a bi-monthly basis. In doing so, the secretariat seeks the Parties' good faith agreement to reengage. The ACHM resumes such activities if the Manager of the secretariat in consultations with the Parties deems that conditions are met to do so.

16. **Remedy and Incentive:** In case such activities are to be terminated because of the lack of cooperation by any of the Parties, the secretariat may refer the complaint to the EFC, who may recommend to the Board the measures included in the Risk Management Framework.

17. **Resolution:** Once all matters are deemed resolved or dispute resolution activities are terminated, the secretariat issues a Final Resolution Report, making mention of any interim solutions reached in the process.

18. The secretariat will include in the Final Resolution Report a succinct analysis of systemic policy-related aspects that may have led to the complaint or its lack of resolution. Such aspects may include Policy compliance, institutional capacity, environmental and social risk management framework, weakness in supervision, technical expertise, disclosure and consultations, or other relevant aspects.

19. This report is shared with the Parties to provide their comments within ***14 business-days***. The secretariat incorporates any relevant comments in the Final Resolution Report, annexes the Parties' comments, and submits the report to the Board.

Who can complain, can it be confidential?

20. Any individual, or their representative(s), living in an area where impacts of a Fund-supported project may occur, can bring a written complaint forward to the secretariat.

21. If complainants believe that there may be a risk of retaliation for raising their concerns, they can request confidentiality. Confidentiality includes names, addresses, pictures and any other identifying information. This provision also applies to complainants' representatives or any other individual believed to be, at present time or in the future, at risk of retaliation.

22. Confidentiality can be requested at any time and is provided throughout the process. Except the secretariat, no one will have access to confidential information.

How and when to complain?

23. Complaints will be submitted in writing in any UN language.[3] However, when a complaint is not submitted in English and for the purposes of translation, additional time may be required to prepare the draft assessment report referenced in paragraph 8.

24. Contact information to submit a complaint are as follows: 1- by electronic email to afcomplaints@adaptation-fund.org; or 2- by hard copy to Adaptation Fund Board secretariat, 1818 H Street NW, N7-700, Washington, DC 20433, USA.

[3] The official languages of the UN are Arabic, Chinese, English, French, Russian and Spanish.

25. Complaints will indicate names and addresses of the complainants. They will also indicate whether representative(s) are appointed, listing the representative(s) names and addresses.

26. Complaints will include any information relevant to the project (i.e., title, location, sector, description ...) including the project activities believed to be the actual or potential source of the harm, the nature of the harm attributed to those activities.

27. Complaints can be sent up to the date of the submission of the final evaluation report of the project concerned.

Exclusions

28. Complaints with any of the following characteristics are excluded from the ACHM:
    a) Anonymous complaints (confidential complaints are different and provided for as per above);
    b) Frivolous, malicious, or vexatious complaints[4];
    c) Complaints from executing entities or their staff against the implementing entity with which they are contracting related to a contract between the executing entity and the implementing entity;
    d) Complaints related to activities that have no relevance to the Fund-supported project; or
    e) Complaints related to matters already addressed in the context of an earlier complaint and for which a solution was agreed upon, unless this complaint is based on new facts not known at the time of the initial complaint.

Disclosure

29. In accordance with Implementing Entities' fiduciary duties to comply with the standard on transparency, anti-corruption measures, and self-investigative authority, the Adaptation Fund will maintain a page on its website, the Accountability Register, relevant to the grievance mechanisms of the Implementing Entities. This page will list each Implementing Entities' grievance mechanisms as well as this ACHM.

[4] The generally accepted meanings of the terms "frivolous, malicious and vexatious" are as follows: (i) frivolous-trivial, trifling or futile, not serious; (ii) malicious-bearing active ill-will or spite, or having wrongful intention toward any other; and (iii) vexatious-causing or tending to cause irritation, frustration or distress, or not having sufficient grounds for action and seeking only to cause annoyance. The factors which may indicate that a complaint is frivolous, malicious or vexatious include the complaint: fails to identify clearly the substance or precise issues which require to be addressed; complains solely about trivial matters to an extent out of proportion to their significance; is part of a "tit for tat" complaint; continually changes, apparently to prolong the engagement with the ACHM; adds no new information from a complaint which has already been addressed by the ACHM; is made by a person who makes excessive contact or unreasonable demands, including abusive behavior and threats.

30. In the interest of transparency, the Adaptation Fund also dedicates on its Accountability Register a page for each complaint received where all relevant documents are disclosed, including final assessment reports, public notices, update reports, and final resolution reports. This page is cross-linked to the project's page.

31. Implementing Entities are encouraged to link the Adaptation Fund's Accountability Register to their website.

Appendix I – NamWater Grievance Handling: Chapter 31

CHAPTER 31

GRIEVANCE HANDLING

1. GENERAL

1.1 All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation.

1.2 Appeals against disciplinary actions will not be dealt with through grievances.

1.3 Employees may lodge grievances without fear of victimisation or harassment.

1.4 Grievances should be resolved as quickly and fairly as possible and at the lowest level possible.

1.5 Aggrieved employees have the right to be assisted by an employee representative who may be a shop steward or a fellow employee.

1.6 Records of grievance hearings will be kept.

2. STEPS IN HANDLING GRIEVANCES

Step 1: Immediate Superior

(i) The employee must in the first instance discuss his/her grievance with the immediate superior**,** or the latter's superior in the event of a grievance against the immediate superior.

(ii) The superior must try to resolve the grievance within five (5**)** working days and inform the aggrieved employee accordingly.

(iii) The aggrieved employee, if not satisfied with the outcome, may appeal to the next higher level.

Step 2: Hearing

(i) The matter is referred to the relevant Manager.

(ii) The employee completes a grievance form with all relevant details. The employee may be assisted by the Industrial Relations Officer. The form is handed to the Divisional Manager.

(iii) The Manager shall hold an inquiry into the grievance which will be attended by the employee concerned, the respondent, the employee's representative, the Industrial Relations Officer and any other person(s) co-opted by the Manager.

(iv) The Manager must pronounce a decision within five (5) working days.

(v) If the aggrieved employee is still not satisfied, he/she may appeal to the General Manager concerned and the Chief Executive Officer whose decision will be final.

3. PROCEDURE FOR A GRIEVANCE THAT INVOLVES MORE THAN ONE EMPLOYEE

If the grievance lodged involves more than one employee, it is recommended that the employees (if more than ten) should select a spokesperson and at least two or three employees to represent the group.

4. ROLE OF AN EMPLOYEE REPRESENTATIVE

4.1 With a view to ensuring that grievances are dealt with efficiently, an employee representative is encouraged to be familiar with the relevant information (which will vary depending on the nature of the dispute) pertaining to the employee and the grievance, such as:

4.1.1 Conditions of employment and NamWater rules;

4.1.2 Knowledge of the work performed by the employee ;

4.1.3 Labour/employment legislation;

4.2 The representative is encouraged to -

4.2.1 Ensure that the employee expresses his/her grievance freely and openly;

4.2.2 investigate and clarify the grievance;

4.2.3 be able to distinguish fact(s) from opinion(s);

4.2.4 note the relevant facts;

4.2.5 establish what outcome is desired;

4.2.6 verify facts (third parties, knowledge, work performed, NamWater rules, regulations, conditions, line of authority, etc.)

4.2.7 decide whether the grievance is valid and advise the employee accordingly.

ROLE OF THE SUPERVISOR / MANAGER

The supervisor and/or Manager of a grievance meeting should –

4.3 listen and encourage the employee to express his / her grievance freely and openly;

4.4 clarify and investigate the grievance;

4.5 focus on the grievance not the employee's personality;

4.6 distinguish fact from opinion;

4.7 note the relevant facts;

4.8 establish what settlement is desired;

4.9 verify facts (third parties, knowledge, work performed, NamWater rules, regulations, conditions, line of authority, etc.);

4.10 obtain assistance from senior or human resources management if necessary.

5. DISPUTES/UNRESOLVED GRIEVANCES

If the grievance is not resolved internally then the employee(s) who lodged the grievance may pursue any remedies which may be available to them in terms of the Labour Act or any other applicable legislation.

Annexure 6: Environmental and social management plan: Bethanie

PILOTING THE USE OF DESALINATION PLANTS THAT UTILISE MEMBRANE TECHNOLOGY AND ARE SUSTAINABLY POWERED BY RENEWABLE ENERGY TO INCREASE THE RESILIENCE OF VULNERABLE RURAL COMMUNITIES TO CLIMATE CHANGE

BETHANIE, //KARAS REGION
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

June 2017

Submitted by:

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NAMWATER
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PROJECT DETAILS

TITLE:	Environmental and Social Management Plan for a Proposed Pilot Desalination Plant, Utilising Renewable Power and Membrane Technology at Bethanie, //Karas Region
AUTHORS:	Mrs Ilze Rautenbach & Mrs Noeleen Greyling
APPLICANT:	NamWater
REPORT STATUS:	Environmental and Social Management Plan (ESMP)
AURECON REPORT NUMBER:	113771
SUBMISSION DATE:	June 2017

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Abbreviations

AF	Adaptation Fund
AFB	Adaptation Fund Board
DRFN	Desert Research Foundation Namibia
DWAF	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EE	Executing Entity
EMA	Environmental Management Act (No. 7 of 2007)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EO	Environmental Officer
ESP	Environmental and Social Policy
ESMP	Environmental and Social Management Plan
I&APs	Interested and Affected Parties
MAWF	Ministry Of Agriculture Water And Forestry
MET: DEA	Ministry of Environment and Tourism: Department of Environmental Affairs
MSDS	Material Safety Data Sheets
NIE	National Implementing Entity
OEMP	Operational Environmental Management Plan
O&M	Operation and Maintenance

PPE	Personal Protective Equipment
TB	Tuberculosis
STD	Sexually Transmitted Diseases
IFC	International Finance Corporation

1 INTRODUCTION

1.1 PROJECT BACKGROUND

This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

As an arid country, Namibia depends heavily on its groundwater resources. This brings two challenges: high rainfall variability makes recharge into aquifers also variable, so groundwater reserves in many places are not reliable. Secondly, groundwater quality is poor in many places, below the thresholds for certain chemicals (e.g. fluoride, total dissolved solids and salinity) for safe human consumption. This requires water treatment techniques, such as filtration or desalination. These in turn demand energy in the form of electricity.

As such the Namibia Water Corporation Ltd (NamWater) as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund (AF). The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology.

1.1.1 Setting the Scene

Water is life. For millions of years' life on earth has been dependent on water for survival. The amount of water on earth is constant and cannot be increased or decreased, but it is unevenly distributed across the earth.[1] According to the IPPR, Namibia is facing a creeping yet increasingly precarious situation of freshwater scarcity, and the UNDP states that Namibia is the driest country in sub- Saharan Africa receives a pitiful 270 millimetres of downpour per year on average. Of this 83 percent evaporates as soon as it hits the ground.

Climatologists predict temperatures in the country will rise with 1 to 6 degree in the next several decades, while rainfall could drop another 200 millimetres. Already, in the past few years, rains have been erratic leading to alternating heavy floods and dry spells. The consequences are devastating for a country where 70 percent of the people to some extent depend on agriculture.

Three sample villages were initially selected for this pilot project, i.e. **Bethanie**, Grunau and Epukiro Post 3. Bethanie is situated in the far south of the country, in the //Karas Region and in the in the Berseba Constituency approximately 140 km west of Keetmanshoop – refer to *Figure 1* below.

[1] http://www.waterwise.co.za/site/water/environment/situation.html

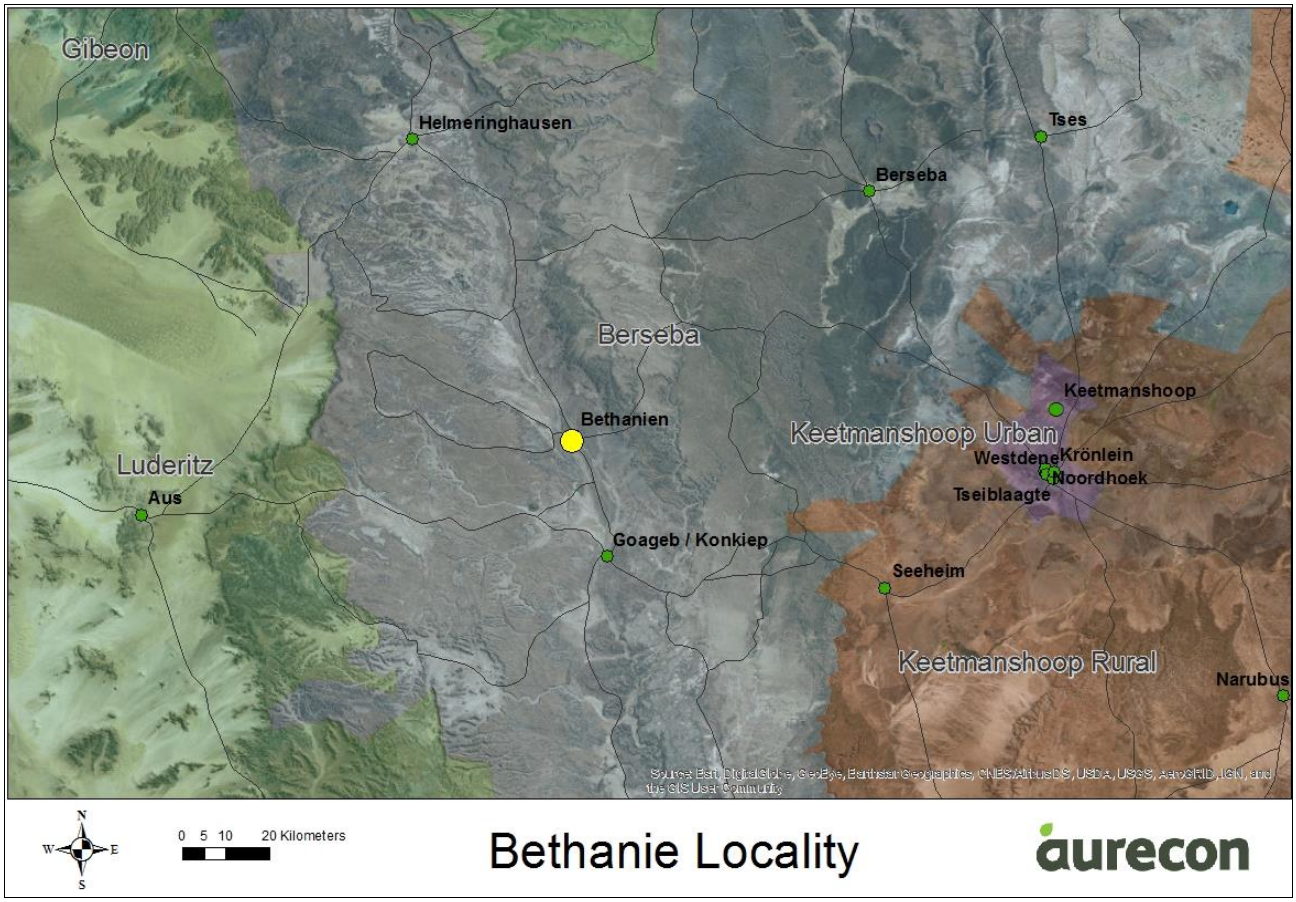

Figure 1: The project locality map

The village has a strong spring and therefore as early as 1804 Orlam Nama people settled in this area. In 1814, the missionary Johann Hinrich Schmelen was sent to Bethanien by the London Mission Society to christianize the Nama. Schmelen built the first stonehouse in Namibia, now known as the "Schmelen House". It is surrounded by several beautiful palm trees and is a National Monument today. It houses the mission history museum of Bethanien. The little village of Bethanien - with around 2,978 residents - is now the logistic centre for the surrounding farms and Nama settlements. It boasts a couple of impressive churches, all in immediate vicinity to the Schmelen House.[2]

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes.

If successful, this project will demonstrate a useful method that can be rolled out to meet similar needs in off-grid communities in Namibia and elsewhere to improve the water situation for remote villages and settlements in the face of climate change.

[2] http://www.namibia-travel.net/travelguide/southern-namibia/bethanien.html

1.1.2 Project summary

The proposed project for the pilot desalination will involve three main objectives, which are:

- *Objective 1: Acquire knowledge and skills on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology that can be applied to improve the resilience of rural communities against climate change.*
- *Objective 2: Positively impact the lives of vulnerable individuals and communities at the two project sites by supplying them with water that complies with the Namibia water quality standards for drinking water, raising their awareness of climate change and the effects on water supply, and creating an understanding by them of why water tariffs are imposed.*
- *Objective 3: Communicate the acquired knowledge and skills to stakeholders in the water supply sector and thereby promote the mainstreaming of such small-scale desalination technology and systems in the country*

To ensure effective implementation of each objectives, seven (7) components were developed. For each component there are various activities which will be implemented. The following are the proposed components for the pilot desalination project:

- *Component 1: Development of pilot desalination plants at Bethanie and Grünau*
- *Component 2: Development of pilot hybrid renewable energy plants at Bethanie and Grünau*
- *Component 3: Testing and commissioning of plants at Bethanie and Grünau, and training of staff*
- *Component 4: Piloting of the plants at Bethanie and Grünau*
- *Component 5: Supply good quality water to the communities at the two project sites during piloting of the plants*
- *Component 6: Sensitise beneficiaries and local stakeholders*
- *Component 7: Information and knowledge dissemination to regional and national stakeholders*

1.1.3 Why Bethanie Village

Bethanie acquires most of its water from two local NamWater boreholes in the Konkiep River, approximately 2 km away from the town. The Village Council indicated that they also operate their own borehole where they pump water on a continues bases for the Village. The Village borehole roughly supplies 60% of the town's water supply while NamWater's boreholes supply the other 40%. NamWater manages the overall water supply scheme and the Bethanie Village Council is responsible for the management of the water reticulation.

Figure 2: Bethanie Community

Past and current operation of the boreholes makes no major impact on the aquifer, and there is sufficient capacity to meet the present and future demand. The scheme currently runs at a maximum of 53% of its recommended abstraction rate, and even in a high-growth scenario this is expected to be about 60% in 2030. The borehole pumps are activated and de-activated

automatically via ball valves in the reservoir, and the scheme has an operator that checks daily that the systems are functional.

Water is reticulated to the town where it is metered at its discharge points to the end consumers. The Council indicated that 90% of households have taps in their yard where the remaining 10% have access to water through communal stand pipes. There is waterborne sewage in the town, while a bucket system is used in the toilets in the informal settlement. The condition of the existing infrastructure is rated as sufficient until at least 2030.

The main problem with the water supply situation is the quality. The water situation at Bethanie is sub-standard because of the high level of fluoride in the groundwater. The fluoride level is high (in the order of 3.3 mg/l), with a quality classification ranging between a Class C and a Class D. The water therefore does not comply with the Namibia Water Quality Standards for human consumption, which requires fluoride to be < 1.5 mg/l. Turbidity also sometimes exceeds the water quality standards and chlorination is occasionally inadequate, leading to the presence of bacteriological contamination by coliforms. Options to rectify these problems have been found to be financially non-viable, and a solution still needs to be found.

In addition, other parameters also exceeding the concentration limits given in the guidelines include calcium, sodium, chlorides, sulphates, total dissolved salts and turbidity as displayed in Table 2 below.

Table 1: Groundwater Quality of Bethanie

Parameters	**Treated Water Requirement (Ideal - 95% mg/l)**	**Bethanie Raw water (Boreholes - mg/l)**
Cations		
Calcium	<200	227
Magnesium	<125	59
Potassium	<25	3.9
Sodium	<100	148
Anions		
Alkalinity, as HCO3		222
Chloride	<100	119
Fluoride	<0.7	3.06
Nitrate	<6	2.3
Sulphate	<100	194
Other		
Conductivity	<80	114
TDS	<500	764
pH	6.0 – 8.5	8.13
Total hardness	<200	286
NTU	<0.5	1.95
TOC**		
SiO_2		42
Colour	10	2.6

** TOC to be analysed for

Fluoride can be beneficial in helping to prevent dental caries at drinking water concentrations of about 1 mg/L, but it also causes dental mottling and adverse effects on bones, including an increased risk of fracture and in extreme cases skeletal fluorosis at concentrations more than 1.5 mg/L.

Extensions that have been recommended to cater for future demand and water quality improvement include a treatment unit (filtration through activated alumina), and installation of a telemetry and monitoring system to reduce operational losses. Alternatively, at greater cost, a desalination plant could be established to improve the water quality. The elevated tower reservoir has a capacity for only 8 hours supply in the event of power outages, and additional storage capacity should be considered for emergencies. It has been suggested that water only for human consumption needs to be treated. This would reduce the cost of the treatment facilities. Small plants could be provided at strategic positions to supply drinking water for collection by residents.

The Desalination Plant will thus clean the water from both the Village and NamWater's water supply to the appropriate quality standards. A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

1.1.4 Desalination Technologies

a) Multi-Stage Flash Distillation (MSF)

In MSF, seawater feed is pressurized and heated to the plant's maximum allowable temperature. When the heated liquid is discharged into a chamber maintained at slightly below the saturation vapour pressure of the water, a fraction of its water content flashes into steam (Karaghouli et al. 2009; 2398). The flashed steam is stripped of suspended brine droplets as it passes through a mist eliminator and condenses on the exterior surface of the heat-transfer tubing. The condensed liquid drips into trays as hot fresh-water product (Karaghouli et al. 2009; 2398).

b) Multi-Effect Distillation (MED)

MED units operate on the principle of reducing the ambient pressure at each successive stage, allowing the feed water to undergo multiple boiling without having to supply additional heat after the first stage. In this unit, steam and/or vapour from a boiler or some other available heat source is fed into a series of tubes, where it condenses and heats the surface of the tubes and acts as a heat-transfer surface to evaporate saline water on the other side (Karaghouli et al. 2009; 2398).

The energy used for evaporation of the saline water is the heat of condensation of the steam in the tube. The evaporated saline water—now free of a percentage of its salinity and slightly cooler—is fed into the next, lower-pressure stage where it condenses to fresh-water product, while giving up its heat to evaporate a portion of the remaining seawater feed (Karaghouli et al. 2009; 2398).

c) Vapour-Compression Distillation (VC)

The VC distillation process is generally used for small and medium-scale seawater desalting units. The heat for evaporating the water comes from the compression of vapour, rather than from the direct exchange of heat from steam produced in a boiler (Karaghouli et al. 2009; 2399). The plants that use this process are generally designed to take advantage of the principle of reducing the

boiling-point temperature by reducing the pressure. Two primary methods are used to condense vapour so as to produce enough heat to evaporate incoming seawater: a mechanical compressor or a steam jet. The mechanical compressor (MVC) is usually electrically driven, allowing the sole use of electrical power to produce water by distillation (Karaghouli et al. 2009; 2399).

With the steam jet-type of VC unit, also called a thermo compressor (TVC), a Venturi orifice at the steam jet creates and extracts water vapour from the main vessel by creating a lower ambient pressure in the main vessel. The extracted water vapour is compressed by the steam jet. This mixture is condensed on the tube walls to provide the thermal energy (heat of condensation) to evaporate the seawater being applied on the other side of the tube walls in the vessel (Karaghouli et al. 2009; 2399).

VC units are usually built in the range of 20–2000cum/d (0.005–0.5 mgd), and they are often used for resorts, industries, or other sites where fresh water is not readily available.

1.1.5 Membrane Processes

a) Reverse Osmosis (RO)

In reverse osmosis (RO), water in a pressurized saline solution is separated from the solutes by a membrane. No heating or phase change is necessary for this separation, and the major energy requirement is for pressurizing the feed water. In practice, the saline feed water is pumped into a closed vessel, where it is pressurized against the membrane. As a portion of the water passes through the membrane, the salt content of the remaining feed water increases because there is less water containing the same total amount of dissolved salts. At the same time, a portion of this saltier feed water is discharged without passing through the membrane.

Figure 3: Containerized reverse osmosis desalination system

RO units have a waste discharge of brackish water or brine that can range from 35% to 100% of its output of fresh water, depending on the feed water being treated. During the past decade, two improvements have helped reduce the operating costs of RO plants - the developments of membranes that can operate efficiently at lower pressures, and the use of energy recovery devices. Low-pressure membranes are being widely used to desalinate brackish water because they save on the energy costs associated with pumping.

b) Electrodialysis (ED)

The basic electrodialysis (ED) unit consists of several hundred cell pairs bound together with electrodes on the outside and referred to as a membrane stack. Feed water passes simultaneously through the cells to provide a continuous, parallel flow of desalted product water and brine that emerge from the stack. The ED process is only economical when used on brackish

water, and it tends to be most economical at Total Dissolved Solids (TDS) levels of up to 4000–5000 mg/L.

In the early 1970s, an American company commercially introduced the EDR process for electrodialysis. An EDR unit operates on the same general principle as a standard electro- dialysis plant except that both the product and the brine channels are identical in construction. At intervals of several times an hour, the polarity of the electrodes is reversed, and the flows are simultaneously switched so that the brine channel becomes the product-water channel, and the product-water channel becomes the brine channel. The result is that the ions are attracted in the opposite direction across the membrane stack. Immediately following the reversal of polarity and flow, enough of the product water is dumped until the stack and lines are flushed out, and the desired water quality is restored. This flush takes about 1 or 2 min, and the unit can then resume producing water. The reversal process is useful in breaking up and flushing out scales, slimes, and other deposits in the cells before they can build up and create a problem. Flushing allows the unit to operate with fewer pretreatment chemicals and minimizes membrane fouling.

1.1.6 Pro's and Con's of the Different Technologies

There are pros and cons of membrane technologies compared to thermal technologies. Some of the advantages and disadvantages of membrane processes vs thermal processes include:

Table 2: Pro's and con's of different desalination processes

Process	Recovery and Total dissolved solids	Pro's (+)	Con's (-)
RO **Preferred option overall**	30-60% recovery possible for single pass (higher recoveries are possible for multiple pass or waters with lower salinity) < 500 mg/L TDS for seawater possible and < less 200 mg/L TDS for brackish water	• Lower energy consumption • Relatively lower investment cost • No cooling water flow • Simple operation and fast start-up • High space/production capacity • Removal of contaminants other than salts achieved • Modular design • Maintenance does not require entire plant to shutdown	• Higher costs for chemical and membrane replacement • Vulnerable to feed water quality changes • Adequate pre-treatment a necessity • Membranes susceptible to biofouling • Mechanical failures due to high pressure operation possible • Appropriately trained and qualified personnel recommended • Minimum membrane life expectancy around five to seven years
ED/EDR	85-94% recovery possible 140 - 600 mg/L TDS	• Energy usage proportional to salts removed not volume treated • Higher membrane life of 7-10 years • Operational at low to moderate pressures	• Only suitable for feed water up to 12,000 mg/L TDS • Periodic cleaning of membranes required • Leaks may occur in membrane stacks • Bacterial contaminants not removed by system and

			post treatment required for potable water use
MSF	25-50% recovery in high temperature recyclable MSF plant < 50 mg/L TDS	• Lends itself to large capacity designs • Proven, reliable technology with long operating life • Flashing rather than boiling reduces incidence of scaling • Minimal pre-treatment of feed water required • High quality product water • Plant process and cost independent of salinity level • Heat energy can be	• Large capital investment required • Energy intensive process • Larger footprint required (land and material) • Corrosion problems if materials of lesser quality used • Slow start-up rates • Maintenance requires entire plant to shut-down • High level of technical knowledge required Recovery ratio low.
MED	0-65% recovery possible < 10 mg/L TDS	• Large economies of scale • Minimal pre-treatment of feed water required • Very reliable process with minimal requirements for operational staff • Tolerates normal levels of suspended and biological matter • Heat energy can be sourced by combining with power generation • Very high quality product water	• High energy consumption • High capital and operational cost • High quality materials required as process is susceptible to corrosion • Product water requires cooling and blending prior to being used for potable water needs.
VCD	~ 50% recovery possible < 10 mg/L TDS	• Developed process with low consumption of chemicals • Economic with high salinity (> 50,000 mg/L) • Smaller economies of scale (up to 10,000 m^3/d) • Relatively low energy demand • Lower temperature requirements reduce potential of scale and corrosion • Lower capital and operating costs • Portable designs allow flexibility	• Start-up require auxiliary heating source to generate vapour • Limited to smaller sized plants • Compressor needs higher levels of maintenance.

(Source: Eltawil et al, 2008; 25 and 26)

Generally, distillation and RO are used for seawater desalting, whereas RO and electrodialysis are used to desalt brackish water. Therefore, the RO technique was chosen as the more preffered option for this study. However, the selection of a process should depend on a careful study of site conditions and the application at hand. Local circumstances may still play a significant role in determining the most appropriate process for an area.

1.1.7 Renewable Technology

The following renewable energy options has been investigated for the proposed pilot studies.

Figure 4: Membrane Distillation installed by SOLARSPRING GMBH

Table 3: Evaluation of renewable energy technologies

Criterion	Solar thermal energy (preferred)	Photovoltaic	Wind energy (preferred)	Geothermal energy
Suitability for powering desalination plants	Well suited for desalination plants requiring thermal power (3)	Well suited for desalination plants requiring electrical power (3)	Well suited for desalination plants requiring electrical power (3)	Well suited for desalination plants requiring thermal power (3)
Site requirements and resources availability	Typically good match with need for desalination (3)	Typically good match with need for desalination (3)	Resources is location-dependent (2)	Resources is limited to certain location (1)
Continuity of power output	Output is intermittent (energy storage required) (1)	Output is intermittent (energy storage required) (1)	Output is intermittent (energy storage required) (1)	Continuous power output (3)
Predictability of power output	Output is relatively unpredictable (2)	Output is relatively unpredictable (2)	Output is very unpredictable/ fluctuates (1)	Output is predictable (3)
Note: 3 = excellent compliance with criterion; 2 = good compliance with criterion; 1 = poor compliance with criterion.				

(Source: Eltawil et al, 2008; 8)

The most mature technologies of renewable energy application in desalination are wind and/or PV-driven membrane processes or a combination of the two and direct and indirect solar distillation. Nevertheless, the coupling of renewable energy and desalination systems has to be optimized (Al-Karaghouli et al. 2009).

1.1.8 Legal framework

Much of the legislation outlined below has applicability from a biophysical, social and visual perspective. While certain relevance is highlighted, such documents are applicable on a variety of different levels.

The Constitution of the Republic of Namibia (1990)

There are two clauses contained in the Namibian Constitution that are of particular relevance to sound environmental management practice, viz. articles 91(c) and 95(l). In summary, these refer to:

- Guarding against over-utilisation of biological natural resources;
- Limiting over-exploitation of non-renewable resources;
- Ensuring ecosystem functionality;
- Protecting Namibia's sense of place and character;
- Maintaining biological diversity; and
- Pursuing sustainable natural resource use.

The above therefore commits the State to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the abovementioned sustainable development objectives.

Namibia's Environmental Management Act (EMA) (Act No 7 of 2007)

In giving effect to articles 91(c) and 95(l) of the Constitution of Namibia, general principles for sound management of the environment and natural resources in an integrated manner have been formulated. This resulted in Namibia's Environmental Assessment Policy of 1994. To give statutory effect to this Policy, the Environmental Management Act was approved in 2007, and gazetted on 27 December 2007 as the Environmental Management Act (Act No. 7 of 2007) (EMA), Government Gazette No. 3966. Part 1 of the Environmental Management Act describes the various rights and obligations that pertain to citizens and the Government alike, including an environment that does not pose threats to human health, proper protection of the environment, broadened locus standi on the part of individuals and communities, and reasonable access to information regarding the state of the environment. Part 2 of the Act sets out 13 principles of environmental management, as follows:

- Renewable resources shall be utilised on a sustainable basis for the benefit of current and future generations of Namibians.
- Community involvement in natural resource management and sharing in the resulting benefits shall be promoted and facilitated.
- Public participation in decisions affecting the environment shall be promoted.
- Fair and equitable access to natural resources shall be promoted.
- Equitable access to sufficient water of acceptable quality and adequate sanitation shall be promoted and the water needs of ecological systems shall be fulfilled to ensure the sustainability of such systems.
- The precautionary principle and the strategy of preventative action shall be applied.

- There shall be prior environmental assessment of projects and proposals which may significantly affect the environment or use of natural resources.
- Sustainable development shall be promoted in land-use planning.
- Namibia's movable and immovable cultural and natural heritage, including its biodiversity, shall be protected and respected for the benefit of current and future generations.
- Generators of waste and polluting substances shall adopt the best practicable environmental option to reduce such generation at source.
- The polluter pays principle shall be applied.
- Reduction, reuse and recycling of waste shall be promoted.
- There shall be no importation of waste into Namibia.
- Promotion of the coordinated and integrated management of the environment;
- The Minister of Environment and Tourism was enabled to give effect to Namibia's obligations under international environmental conventions;
- Certain institutions were established to provide for a Sustainable Development Commission and Environmental Commissioner"[3].

Environmental Guidelines

The EMA, under section 5, states that if a proposal is likely to affect people, the following guidelines should be considered in Scoping / EA:

- The location of the development in relation to interested and affected parties (I&APS), communities or individuals;
- The number of people likely to be involved;
- The reliance of such people on the resources likely to be affected, the resources, time and expertise available for scoping;
- The level of education and literacy of parties to be consulted;
- The socio-economic status of affected communities;
- The level of organisation of affected communities;
- The degree of homogeneity of the public involved;
- History of any previous conflict or lack of consultation;
- Social, cultural or traditional norms within the community; and
- The preferred language used within the community.

The MET also released a Draft Procedures and Guidelines for conducting EIAs and compiling EMPs in April 2008. These guidelines outline the procedures and principles that are to be followed and is also applied here to ensure an effective process and an EMP that addresses all identified impacts.

Namibia Vision 2030

The principles that underpin Vision 2030[4], a policy framework for Namibia's long-term national development, comprise the following:

[3] *Environmental Management Act, 2007 (Act No. 7 of 2007), of the Parliament. Namibia Government Gazette No. 3966*

- Good governance;
- Partnership;
- Capacity enhancement;
- Comparative advantage;
- Sustainable development;
- Economic growth;
- National sovereignty and human integrity;
- Environment; and
- Peace and security.

Vision 2030 states that natural environments are disappearing quickly. Consequently the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets. Vision 2030 emphasises the importance of promoting Healthy Living which includes that the majority of Namibians are provided with basic services. The importance of developing Wealth, Livelihood and the Economy is also emphasised by Vision 2030.

This Project therefore supports the goals to be achieved in Vision 2030, because the desalination plant will allow for better treated quality water.

National Policy on Climate Change for Namibia (2011)

The National Policy on Climate Change pursues constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation."

The policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia's national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Similarly, the policy takes cognizance of Namibia comparative advantages with regard to the abundant potential for renewable energy exploitation, of which this project has taken specifically into account.

The overall goal of the National Policy on Climate Change is to contribute to the attainment of sustainable development in line with Namibia's Vision 2030 through strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.

The project therefore addresses some of the above as it will increase water quality and security, as well as provide a medium-long-term integrated water supply plant that would ensure sustainable utilisation of the available resources as well as the incorporation of renewable energy sources.

National Climate Change Strategy & Action Plan 2013 – 2020

[4] Derived from Namibia's Green Plan drafted by MET in 1992 and followed by the sequence of National Development Plans.

Climate change impacts directly on the entire chain of national development, and is likely to have negative impacts on efforts to achieve development objectives, including the long-term objectives and targets of Namibia's Vision 2030. Climate change is a complex and cross-cutting concern, thus there is a need for a holistic and integrated approach to developing a multi-sectoral (cross-practicebased) National Climate Change Strategy and Action Plan (NCCSAP) in order to implement the National Policy on Climate Change (NPCC), which was promulgated in Namibia in 2011.

The NCCSAP has been developed as a result of the growing concern and discourse focusing on climate variability, and climate change risks and impacts affecting Namibia's social, environmental and economic developmental potential. The Strategy and Action Plan is a key instrument to operationalise the NPCC over a period of 8 years from 2013 – 2020 as a first comprehensive and practical tool which offers guidance on the mechanisms, means and manner in which implementation can happen.

It is clear that climate change awareness, knowledge and understanding, both in terms of the risks, impacts and responses is rapidly developing, and therefore a mid-term review process of the implementation and impact of the NCCSAP is foreseen.

Water Resources Management Act (Act no. 11 of 2013)

This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Relevant principles of the Act include, inter alia:

- Equitable access for all people to safe drinking water is an essential basic human right to support a healthy productive life;
- Harmonisation of human water needs with the requirements of environmental ecosystems and the species that depend on them, while recognising that the water resource quality for those ecosystems must be maintained;
- Promotion of the sustainable development of water resources based on an integrated water resources management plan which incorporates social, technical, economic, and environmental issues;
- Development of the most cost effective solutions, including conservation measures, to infrastructure for the provision of water; and
- Promotion of water awareness and the participation of persons having interest in the decision-making process should form an integral part of any water resource development initiative.

The Department of Water Affairs (DWA) in the Ministry of Agriculture, Water and Forestry (MAWF), is the legal custodian of the wastewater treatment and disposal standards in the country. In accordance with Sections 68 to 75 of the Water Act No 11 of 2013, details of any treatment facility must be submitted to the DWA for the issuing of a wastewater / brine discharge licence. It is therefore necessary that any facility provided meet these requirements.

The purpose of the proposed project is mainly to allow for better quality drinking water and more sustainable adaptable climate change processes. As indicated a wastewater/brine discharge licence is required before the wastewater/brine can be discharged in any way.

This Act will partially be replaced by the Water Act (Act No. 54 of 1956) once it is implemented by government.

Water Act (Act 54 of 1956)

This Act partially replaced by the Water Resource Management Act, consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes. The main purpose of the Water Act is to provide for the sustainable development and use of water resources, and restricts the pollution of waters by means of any activity.
This Act requires the proposed development to investigate and implement measures to ensure sustainable use of water resources and ensure that no pollution of any above or below ground water takes place.

Water & Sanitation Policies

The existing water and sanitation policies in place are the National Water Policy (NWP) adopted in 2000 the Water Supply and Sanitation Sector Policy (WSASP) which was adopted in 2008 and the National Sanitation Strategy of 2009, which is based on this WSASP policy.
In terms of the Act and the **Water Supply and Sanitation Policy**, the developer / client will:

- Take steps to prevent "any public or private water on or under that land, including rainwater that falls on or flows over or penetrates such land" from being polluted.
- Require a permit for the disposal of effluent/brine and or industrial wastewater.

Of particular concern is the prevention of surface- and groundwater pollution, therefore the collection, storage, disposal and potential re-use of sewage-/brine and storm water is of utmost importance.

In terms of the **National Sanitation Strategy 2010/11 – 2014/15**, the developer/contractor must put in place strategies:

- Guaranteeing safe and affordable sanitation, encouraging decentralised sanitation systems where appropriate.
- That should promote recycling through safe and hygienic recovery and use of nutrients, organics, trace elements, water and energy, and the safe disposal of all human and other wastes, including sewage and industrial effluent, in an environmentally sustainable fashion.

Code of Practice: Volume 2 – Pond Systems (2008)
In the Water Resources Management Act, 2013 (Act No. 11 of 2013), there are conditions laid down to ensure that proper wastewater treatment is provided and to facilitate good operation of different wastewater treatment systems and their methods of disposal. The act's main objectives

are to use and protect one of our most valuable natural resources, namely water, and to encourage reuse of the treated wastewater where possible.

Biological treatment processes, which include activated sludge processes, trickling filters (biofilters), oxidation ponds and even the self-purification powers of rivers, all operate on essentially the same fundamental biochemical principles. They differ from one another primarily in the method of adding and utilising dissolved oxygen.

In this manual, pond systems as a biological treatment process are addressed. There are many different pond systems in use throughout the world, with the most common names being anaerobic/aerobic-, stabilisation-, oxidation-, facultative, algae-, evaporation- and maturation ponds.

Code of Practice: Volume 6 – Wastewater Reuse (2012)

Namibia is an arid country and the Water Resources Management Act 2013 (Act No. 11 of 2013)) therefore also encourages the reuse of suitably treated wastewater. Treated wastewater can and should be reused where possible in order to protect valuable natural water resources and this guideline addresses the use of greywater and treated domestic and industrial effluents / waste water for reuse in industrial, agricultural and aquacultural applications. However, it is important to realize that there is a certain risk to the general public coupled to wastewater reuse and carelessness can lead to widespread public health hazards, water borne diseases and can even result in epidemics and fatalities.

When dealing with recovered wastewater emphasis must be placed on continuous monitoring and safe use thereof, especially where treated wastewater ultimately comes into direct contact with humans, or plants and animals consumed by humans, in order to guarantee public health and safety at all times. Wastewater irrigation, for example, can present a risk to public health if not carefully controlled and applied as stipulated in this guideline. However, wastewater reuse can be beneficial because it can prevent over-exploitation of natural water resources. Also, wastewater contains valuable nutrients and no fertiliser needs to be added when reusing treated, domestic effluent for agricultural purposes. Thus the advantages and disadvantages of wastewater reuse must be carefully weighed up when determining areas of application for such reuse.

In this manual, the treatment and reuse of wastewater are discussed. Water Quality Standards for Effluent are also listed in Appendix A of the manual.

Guideline for disposal of solids from water and wastewater treatment processes (2012)

This guideline addresses the use and disposal of solids generated during the treatment process by both drinking water and wastewater treatment plants. Due to the costs associated with landfill disposal options, environmental concerns and globally increasing awareness about waste reduction and recycling, the purpose of this guideline is to inform plant owners how to safely discard their solid waste and to promote the safe and feasible reuse of such waste.

When dealing with recovered wastewater sludge emphasis must be placed on the continuous monitoring and safe use thereof, especially where such sludge comes into direct contact with

humans, or plants and animals consumed by humans. Possible risks and hazards related to sludge use include:

- water-borne diseases caused by helminth, bacterial, viral and/or protozoan infections.
- aesthetic issues like odor pollution or decreased product sales due to consumers not wanting to buy products that were produced using wastewater.
- environmental issues including groundwater contamination, endangering of marine life and pollution of water bodies used for recreational purposes.

The disposal of sludge for agricultural purposes and other methods are discussed in this guideline. Various restrictions and other monitoring measurements are also explained.

Namibia Agricultural Policy (2015)

The Namibia Agriculture Policy is aimed at contributing to increased agricultural production, agro-processing and marketing as well as to serve as an overarching policy in the agricultural sector. The document is divided into two major parts.

Part A articulates the policy and strategies for the agriculture sector. The theme areas cover production, agro-industry development, marketing and trade, research and development, international cooperation, training and capacity building, management information systems, agro-financing, co-operative development and extension services.

Part B of the Policy outlines mainly the role of stakeholders, policy implementation and revision as well as monitoring and evaluation mechanisms.

Forestry Act (Act 12 of 2001), As Amended

The Act deals with forests in general and matters incidental thereto. Of importance to the proposed development is that the Act affords general protection of the environment (Part IV). Section 22 affords protection to natural vegetation stipulating that no living tree, bush or shrub within 100 m from any river, stream or watercourse may be removed without the necessary license. Permits are required for the removal of trees, bushes or shrubs, or any indigenous plants.

Soil Conservation Act (Act 76 of 1969), As Amended

Partially similar to the other acts and ordinances above, this Act addresses the issues of vegetation and ground water, but also includes the matter of soil. In specific the Act focuses on combating and preventing soil erosion; the conservation, protection and improvement of soil and vegetation and water sources and resources.

Pollution Control and Waste Management Bill (in preparation)

This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force.

In terms of water pollution, it will be illegal to discharge of, or dispose of, pollutants into any watercourse without a Water Pollution Licence (apart from certain accepted discharges). Similarly an Air Quality Licence will be required for any pollution discharged to air above a certain threshold.

The Bill also provides for noise, dust or odour control that may be considered a nuisance. The Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.

Atmospheric Pollution Prevention Ordinance (No.11 of 1976), As Amended

The Atmospheric Pollution Prevention Ordinance (APPO) (No. 11 of 1976) addresses the following:

- Part II: Controls of noxious or offensive gases;
- Part III:Atmospheric pollution by smoke;
- Part IV: Dust control; and
- Part V: Air pollution by fumes emitted by vehicles.

This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. Any person carrying out a 'scheduled process' which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health. The Ordinance is clear in requiring that –

(1) Any person who in a dust control area –

> *(b) has at any time or from time to time, whether before or after the commencement of this Ordinance, deposited or caused or permitted to be deposited on any land a quantity of matter which exceeds, or two or more quantities of matter which together exceed, twenty thousand cubic metres in volume, or such lesser volume as may be prescribed, and which in the opinion of the Director causes or is liable to cause a nuisance to persons residing or present in the vicinity of such land on account of dust originating from such matter becoming dispersed in the atmosphere.*

Although we do not anticipate the development to generate any significant levels of noxious or offensive gasses, the proponent needs to ensure that a registration certificate (air pollution permit) is obtained, if required. As duty of care, the proponent should implement the necessary mitigation measures set out in in order to limit emissions to air in the form of dust and emissions during construction and operations where applicable.

Hazardous Substance Ordinance (No 14 of 1974), As Amended

This ordinance provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable

nature or the generation of pressure thereby in certain circumstances. It covers manufacture, sale, use, disposal and dumping as well as import and export. These substances are grouped (Group I, II, III, and IV) in terms of section 3(1) of the mentioned Ordinance.

The responsibility lies with the proponent of the Project to conform to the Hazardous Substances Ordinance (No 14 of 1974). Caution is required in the storage and handling of any hazardous substances as it pose potential harm to humans and the natural environment if incorrectly applied or handled.

The Public Health Act (Act no 36 of 1919)

This Act covers a variety of aspects with relevance to the general wellbeing and health of the public. With relevance to the development and associated infrastructure this Act refers to the control of nuisance, but also the prevention of pollution of public waters.

Section 119 of this Act prohibits the existence of a 'nuisance' on any land owned or occupied by any person. Having relevance to the proposed development, the Act defines 'nuisance' as:

- *any stream, pool, lagoon, ditch, gutter, watercourse, sink, cistern, water closet, earth closet, privy, urinal, cesspool, drain, sewer, dung pit, slop tank, ash pit or manure heap so foul or in such a state or so situated or constructed as to be offensive or to be injurious or dangerous to health;*
- *any well or other source of water supply or any cistern or other receptacle for water, whether public or private, the water from which is used or is likely to be used by man for drinking or domestic purposes or in connection with any dairy or milk shop or in connection with the manufacture or preparation of any article of food intended for human consumption, which is polluted or otherwise liable to render any such water injurious or dangerous to health;*
- *any factory or trade premises not kept in a cleanly state and free from offensive smells arising from any drain, privy, water closet, earth closet, or urinal, or not ventilated so as to destroy or render harmless and inoffensive as far as practicable any gases, vapours, dust or other impurities generated, or so overcrowded or so badly lighted or ventilated as to be injurious or dangerous to the health of those employed therein;*
- *any factory or trade premises causing or giving rise to smells or effluvia which are offensive or which are injurious or dangerous to health;*
- *any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health;*
- *any other condition whatever which is offensive, injurious or dangerous to health.*

No other nuisance as per the definition above is associated with the proposed project *as such*, other than the main intent of treating water and disposing of brine. Care should however be taken during the operational phase to limit the smells in regards to the plant to other residential, recreational and or tourism activities and the fact that it could be categorised as causing a public nuisance under common law.

Part III of the General Regulations promulgated under the Health Act (Act 36 of 1919) focus on the prevention of pollution of public surface or ground water by various means.

The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS

The relevance of this policy for the proposed project stems from the fact that construction activities may involve the establishment of temporary construction workforce within the local village. Experience with other construction projects in a developing-world context has shown that, where construction workers have the opportunity to interact with local community, a significant risk is created for the development of social conditions and behaviors that contribute to the spread of HIV and AIDS.

In response to the threat the pandemic poses, MET has developed a policy on HIV and AIDS. This policy, which was developed with support from United States Agency for International Development (USAID), Gesellschaft für Internationale Zusammenarbeit (GIZ), provides for a non-discriminatory work environment and for workplace programs managed by a Ministry-wide committee.

The Labour Act (Act no 27 of 2004)

Under this Act, occupational exposure to employees is covered under the regulations relating to the Health and Safety of employees at work. Sub-contractors however will not be subject to any provisions of the Act, as sub-contractors are not considered to be employees in terms of Namibian common law.

Section 3(1) of the Regulations stipulates that in areas where it is suspected that noise levels are above 85dB(A) over an eight hour period, the employer shall take reasonable steps to reduce the levels to below 85dB(A). If this is not possible, noise areas (those above 85 dB (A)) must be clearly marked and measured every 36 months.

Employees who work in noisy areas must be provided with hearing protection devices free of charge and must undergo medical surveillance at least once every 36 months. Employees who are exposed to levels exceeding 85 dB (A) must be adequately and comprehensively informed and trained regarding the wearing of personal protective equipment and the potential risks of exposure to noise and the precautions to be taken to protect against the risks associated with the exposure to noise.

Chapter IV of the Regulations stipulates that all employees have the right to health and safety at the workplace. A Health and Safety Officer must be appointed in order to maintain a healthy and safe environment to all workers during the Construction phase. Prior to the promulgation of the Labour Act (Act of 1997), a large number of regulations had been gazetted dealing with different aspects of employer and employee rights and obligations. Included in these are regulations relating to health and safety in the workplace. The administration of these regulations, however, is assigned to various ministries by Proclamation 10/1997, as published in Government Gazette 1615.

National Gender Policy (2010 – 2020)

The National Gender Policy was designed with the objective to effectively contribute to the attainment of the objectives of Vision 2030, in order to create a society in which women and men enjoy equal rights and access to basic services. It serves also to provide opportunities for women and men to participate in and contribute towards the political, social, economic and cultural development of Namibia.

In order to address gender inequality and promote women's empowerment, the National Gender Policy will focus on the following key programme areas:

- Poverty and Rural Development;
- Education and Training;
- Health,
- Reproductive Health and HIV and AIDS;
- Gender based Violence;
- Trade and Economic Empowerment;
- Governance and Decision-Making;
- Media, Information and Communication;
- Environment;
- Issues of the Girl-Child;
- Legal Affairs and Human Rights;
- Peace-building,
- Conflict Resolution and Natural Disaster-Management; and
- Gender Equality in the Family Context.

The National Heritage Act (Act no 27 of 2004)

The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. The National Heritage Council has been established to identify, conserve, manage and protect places and objects of heritage significance.

Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains (defined in Part 1, Definitions 1), while Section 48 *ff* sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council.

1.1.9 Brine Wastewater

High salt-content brine is the desalination waste to be disposed of or recycled (IRENA, 2012). At present, it is mostly discharged into the sea or diluted and sprayed into an open space (ibid). However, the negative impact of brine on the ecosystems and the growing desalination capacity mean that a sustainable solution is needed for disposal and/or brine recycling to avoid environmental impacts (Gude, 2010).

Disposal Options

Table 4: Brine disposal and management options - Advantages and Disadvantages

Disposal into water body	• Low cost; • Easy to operate	• Environment damageable; • Violate regulations and laws
Deep well injection	• Able to isolate waste from water sources • More feasible and reliable than surface water disposal	• High requirement of assessing geological conditions; • Environmental impact is unknown.
Evaporation ponds Preferred Option	• Simple and easy to operate; • Low cost;	• Only efficient in arid and semi-arid areas; • Requires large area of land
WAIV technology	• Reduces land requirements compared to evaporation ponds; • More efficient compared to evaporation ponds.	• Availability only demonstrated on a pre- commercial scale; • Not feasible for large amounts of brine.
Membrane distillation	• Energy consumption is low compared with evaporation methods; • Could be easy coupled with solar ponds or other residual heat sources; • Available on industrial scale.	• Discharge at high temperature; • Fluxes are lower than in other membrane processes for industrial applications.
Two-stage reverse osmosis	• Significant improvement in desalination plants;	• Cost of reagents is required
Forward osmosis	• Increase water recovery significantly; • Low energy requirements.	• Require draw solutes and specifically designed membranes to improve its performance.
Electrodialysis	• Efficiently reduce fouling and scaling on membranes; • Reduce brine volume and concentrate the brine significantly; • Not only reject sale, but also other ions; • Low pressure operation compared with RO.	• Require technical operators; • Organic matter and colloids cannot be removed; • Pre-treatment is needed; • More expensive than RO; • High capital investment and cost.
Reverse electrodialysis	• Offset cost by generating power; • An innovative renewable energy; • Greatly reduce the waste quantity.	• The construction in water body may influence the ecosystem; • Requires a concentration difference; • Still under research, not mature for commercial use.
Integrated aquaculture scheme	• Reuse the rejected brine for aquaculture instead of disposing to environment; • Provides alternative water source for arid and semiarid regions; • Less capital investment and cost; • By connecting fish farming ponds with irrigation fields, the organic food and feed with high protein for humans and animals; • Provides food and feed with high protein for humans and animals.	• Requires large area of land; • Salt accumulation in the land in irrigation may cause land contamination; • The brine waste water needs to be fully tested before used in fish farming; • Different plants have different sensitivity to salinity; • The feasibility also depends on the local fishing market.

Source: (Morillo et al., 2014)

Compared to other desalination systems, RO desalination offers many benefits. The difficulty, however, comes with the disposal of wastewater. For every gallon of freshwater produced by RO, an equivalent amount of brine waste is discharged.

However, like most industrial processes, RO desalination produces a waste product that can be disposed of responsibly with minimal impact on the environment, and there are naturally-occurring locations where this is possible, such as where a freshwater source meets a saltwater source. Dumping extra-salty water in a region where salt water and freshwater are already mixing lessens its impact on the environment. Likewise, releasing brine waste over a large area of the seafloor (via a network of pipes, for example) also minimizes its impact on the environment. If neither of these is an option, brine waste can be naturally evaporated in ponds into commercial salt - a common practice for existing desalination plants.

Brine disposal practices are regulated and monitored by local environmental protection departments. As discussed in section 1.3.7 – 1.3.9 regarding wastewater disposal, the Department of Water Affairs (DWA) in the Ministry of Agriculture, Water and Forestry (MAWF), is the legal custodian of the wastewater treatment and disposal standards in Namibia. In accordance with Sections 68 to 75 of the Water Act No 11 of 2013, details of any treatment facility must be submitted to the DWA for the issuing of a wastewater / brine discharge licence. It is therefore necessary that any facility provided meet these requirements.

1.2 RISKS/IMPACT SCREENING AND CATEGORISATION

The identified risks or impacts during public consultation and project concept design were screened with the ESP principles to determine whether further assessment are required and potential impact of the risks. Most of them have **NONE-LOW** and **LOW TO MEDIUM** risks arising from the projects components and its activities. Low and mediums risks were identified in the principles below and the project is classified as **category B project**:

Table 5: Environmental, Social and Gender risks

No	Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
1	*Compliance with the Law (include gender)*	The project comply with the following Namibia's Law: Environmental Management Act (EMA) (2007). • *The Constitution of the Republic of Namibia (1990)* • *Namibia Vision 2030* • *National Climate Change Strategy & Action Plan 2013 – 2020* • *Water Resources Management Act (Act no. 11 of 2013)* • *Water & Sanitation Policies* • *Forestry Act (Act 12 of 2001), As Amended* • *Soil Conservation Act (Act 76 of 1969), As Amended* • *Pollution Control and Waste Management Bill (in preparation* • *Atmospheric Pollution Prevention Ordinance (No.11 of 1976), As Amended* • *The Public Health Act (Act no 36 of 1919)* • *The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS* • *The Labour Act (Act no 27 of 2004)* • *National Gender Policy (2010 – 2020)*	**NONE**

		• *Code of Practice: Volume 2 – Pond Systems (2008)* • *Guideline for disposal of solids from water and wastewater treatment processes (2012)* • *National Policy on Climate Change for Namibia (2011)* Permits will be required for the disposal of the brine from the treatment plant and removal of any protected trees. Application for the brine disposal permit to the Ministry of Agriculture Water and Forestry who are supporting this project as per attached letter of support will me executed by NamWater.	
2	*Access and Equity (include gender)*	The water provided by the project will be distributed through the normal system managed by the relevant Village Councils. No residents will be denied access to the service that is provided. Women and children are identified as being vulnerable to climate change impacts (MET 2015). All consumers served by the project will be subject to the tariff system managed by the relevant Village Council or Regional Council. This follows a 'rising scale', where a minimum amount adequate for health and sanitation is provided at a basic fee. Consumers who use more (according to set thresholds) pay for the water at higher rates. This is part of the demand management system which seeks to provide a minimum amount of water for basic needs at an affordable fee, while curbing excessive use with higher fees.	**LOW**
3	*Marginalized and Vulnerable Groups (include gender)*	The project will not impose adversely impact on marginalised and vulnerable people in the selected areas. Displacement of people will not happen as NamWater existing land will be used and if extra land will be required NamWater will follow the	**LOW**

		procure of consulting with the relevant bodies e.g. Local Authority to acquire the land. The project will provide resilience opportunities for indigenous people by creating employment opportunities which will consider marginalised and vulnerable groups because of their previous disadvantage status. Given the nature of the project, gender awareness will be mainstream in the entire project to ensure the equal participation of both genders in decision making more especial women and children. The risks under this principles are low in nature will be managed by implementing the provided mitigation measures.	
4	*Human Rights (include gender)*	The project will empower communities in the project areas to exercise their human right as underlies in the Namibia's Constitution, Vision 2030 and the Environmental Management Act. The project will not violate any human right of the community members	**NONE**
5	*Gender Equity and Women's Empowerment*	The proposed project components and its activities will be planned, implemented and monitored by a public entity and fair and equitable gender representation will be implemented. As it is a national priority, effort will be made to ensure equal participation of women in the decision making of the project. Structural gender inequalities embedded in our society - unequal access to and control over material and non-material resources, assets and opportunities. The structures which organise the division of labour will ensure that no discrimination occur because of gender. The project will also provide capacity building and training and skills transfer to women in the project area for sustainable	**NONE TO LOW**

		livelihood generation.	
6	*Core Labour Rights (include gender)*	The project will ensure full compliance to the labour act and all labour related matters being it wages, recruitments etc will be conducted as per the labour act. The project will by no means violate the labour act.	**NONE**
7	*Indigenous Peoples*	Indigenous people such as San, Himba and Zemba are the most marginalized groups in Namibia. In Namibia, indigenous people are defined as those people who have special attachment to their land, who are marginalized, disposed and discriminated against. To date, indigenous people such as the San remain the landless and have yet to reap the benefit of democracy. Although indigenous people have formal right to participate, thy have no influence over national issues and rarely consulted on issues affecting them directly. It should be noted that these people have been subjected to unequal treatment and discrimination over many years and therefore special consideration of empowering them should be made in the proposed project to complement the special program which the government is currently undertaking. Furthermore, the Constitution of Namibia provides legislative and normative framework for the protection of indigenous minorities. These legislative and normative framework should be followed or consider in the proposed project to ensure the acceptance and success of the proposed project. The selected areas for the project is mostly inhabitant by the San and Damara people. The project will ensure that this people are included and consulate for this project.	**LOW**

8	*Involuntary Resettlement*	No resettlement will be needed in the pilot projects or because of the project.	**NONE**
9	*Protection of Natural Habitats*	Integrated in the project design to ensure that the natural habitats is protected during the implementation of all the project components. The project will ensure that the natural habitat is protected by complying with law mentioned in principle 1. At this stage it is envisage that the project will pose no risks to the natural habitat since the area which will be used to implement most of the project components is already disturb or have existing water supply infrastructure which belong to NamWater. For the selected project sites with existing infrastructure environmental clearance certificate were already obtained. In addition, the proposed project components concept design was also issued with an environmental clearance certificate which the findings will be validated once the detailed design is completed. Any component implementation that will pose threat to the natural habitat after the completion of the design will be implemented in compliance of the Environmental Management Act of 2012.	**LOW TO MEDIUM**
10	*Conservation of Biological Diversity*	Integrated in the project design to ensure that the flora and fauna are protected from any adverse impact during the implementation of the project components. The proposed project sites are already disturb and have environmental clearance certificates. The ESMP will be used to ensure the protection of biological diversity. At this stage, it is envisage that, the project will not	**LOW**

		cause any harm to the biological diversity if the mitigation measures will be implemented.	
11	*Climate Change*	The project is proposed to increase the adaptive capacity of the communities in the selected areas to the effect of climate change which is affecting water quality and reducing water supply. The project components will not introduce GHG in the atmosphere to contribute to the climate change, but rather uses renewable energy which is a mitigation measure to climate change.	**NONE**
12	*Pollution Prevention and Resource Efficiency*	Integrated in the design of the project that, the waste which will be generated from this project is managed in compliance with the law mentioned in principle 1. The project will generate brine which will be kept in sealed evaporation ponds to minimise leakages to ground water and thus contamination. Appropriate monitoring program of the waste generated from sites will be implemented in consultation with relevant stakeholders. Moreover, disposal permits for the brine will also be obtained from the Ministry of Agriculture Water and Forestry once the detailed design is completed as a requirement for issuance of the permits.	**LOWO TO MEDIUM**
13	*Public Health*	The project is aimed to improve the quality of water which is currently not suitable for human consumption. The health of the communities' members in the selected area will improve after the implementation of the project. At this stage, the current quality of water supplied to the	**NONE**

		communities members is causing a lots of health related issues. The project will not pose any impact on the health of the public.	
14	*Physical and Cultural Heritage*	No adverse impact related to cultural heritage have been identified. However, care should be taken if/when sites and objects (historical sites, historical artefacts, rock art sites, ruins, fossils and archaeological objects etc) protected by the law are encountered that these are reported to the National Heritage Council of Namibia as prescribed by this Act.	**NONE**
15	*Lands and Soil Conservation*	Restoration activities will helps land and soil conservation of sites during construction phase. The project will ensure that the removed land or soil during construction is retain to its natural states and re-vegetated when necessary.	**LOW**

1.3 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

The identified environmental and social risks or impacts shown in Table 6&7 were assessed and mitigation measures were developed for each risk. The IE will ensure that the identified mitigation measures are implemented to minimise the impacts of the identified risks.

Table 6: Potential environmental impacts/risks and the mitigation measures

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
PRE-CONSTRUCTION/DESIGN PHASE			
Non-compliance with the laws and other administrative orders of national and state government.	• Principle 1 (required) – Compliance with National Regulations	• The project is in compliance with major laws such as National Climate Change Strategy & Action Plan 2013 – 2020, Water Resources Management Act (Act no. 11 of 2013), and Environmental Management Act 2012. • Valid Environmental clearance certificates for the existing water supply infrastructure at the proposed sites are available. • Environmental clearance certificates for the proposed concept design are available. • Water abstraction permits available for all sites. • Apply for brine disposal permits once the detailed design is completed. • Apply for a permit from MAWF if any protected tree needs to be removed. • Collect and submit water samples pre and post operation (testing or piloting phase) to make sure the Water Quality Standards are achieved.	• NamWater
Land acquisition and potential removal of local animals	• Principle 1 (required) – Compliance with	• Ensure careful selection of site to avoid sensitive habitats or priority species • The land would be owned or leased by NamWater where possible. • Proper protocol or consultation with relevant	• NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	National Regulations • Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	stakeholders or local authorities will be followed to acquire a piece of land if necessary. • No unintentional removal of local animals will be allowed, and if required consultation should be made with the Ministry of Environment and Tourism.	
CONSTRUCTION PHASE			
Law changes during Construction Phase	• Principle 1 (required) – Compliance with National Regulations	• Proper communications should be done between NamWater and the various competent authorities (MET, MAWF etc.) to make sure what could change / is in process of being promulgated before construction starts, so that there are no surprises.	• NamWater • DRFN
Land and vegetation clearing	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservati	• Clear only the vegetation absolutely necessary for the plant construction and proper operations. • Only clear vegetation in phases, to minimise erosion and windblown dust. • Save the topsoil so that it can be reused later during rehabilitation. • Any Protected trees that needs to be removed, needs a permit from MAWF before this can be	• Main responsibility: **Contractor** • Supervision: **NamWater** • Coordination: **ECO**

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	on of Biological Diversity • Principle 14 – Physical and Cultural Heritage • Principle 15 – Lands and Soil Conservation	done. • If required ecological / botanical specialist must be appointed to assess the potential sites and the removal of any protected species where applicable.	
Protection of natural systems	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 14 – Physical and Cultural Heritage	• Disturbance of vegetation and faunal communities and their habitats is kept to a minimum. • Heavy construction vehicles should be kept out of the seasonal and ephemeral stream channels and the movement of construction vehicles should be limited where possible to the existing roads. • Riparian / Oshana areas disturbed should be rehabilitated, by the removal of alien vegetation where found and the re-vegetation of these disturbed zones with suitable indigenous vegetation. • All earthworks equipment operators shall be informed to cease operating immediately if any artefact is unearthed and to report the finding immediately to the Engineer / ECO and OTC, who in turn shall notify the National Heritage Council.	• Contractor • ECO • NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	• Principle 15 – Lands and Soil Conservation		
Pollution of soil and groundwater	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall events. • The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. • All tanks and/or mobile bowsers shall be situated in a bunded area. • The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas.	• Contractor • ECO • NamWater
Access, traffic and haul roads	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of	• The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times. • Fencing to be installed and properly maintained.	• Contractor • ECO • NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Biological Diversity		
Solid waste management	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• The Contractor shall provide sufficient number of rubbish bins with secured lids to prevent animal scavenging. • No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the site.	• ECO • Contractor • NamWater
Hazardous substances	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 –	• Hazardous chemical substances used during construction shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.	• Contractor • ECO • NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Lands and Soil Conservation		
Trenches	• Principle 10 – Conservation of Biological Diversity • Principle 15 – Lands and Soil Conservation	• Trenches shall be demarcated appropriately and securely and regularly monitored to ensure that pedestrians / animals (and vehicular) access to these areas is strictly prohibited.	• Contractor • ECO • NamWater
Erosion, water quality, and storm water	• Principle 9 – Protection of Natural Habitats • Principle 15 – Lands and Soil Conservation	• The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation. • The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works because of storm water flows. • Storm water should be managed appropriately at the culvert crossing where the pipeline is planned to go through underneath the road, so that blockage does not occur.	• Contractor • ECO • NamWater
OPERATIONAL PHASE			
Leakage of brine into soil and groundwater	• Principle 12 –	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall	• NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
from ponds (poor design, damage of lining during cleaning, flooding during heavy rain)	Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	events. • Competence of operating staff employed at the plant • Develop a proper and up to date Operation and Maintenance (O&M) manual of procedures with technical guidelines • Routine and proper environmental monitoring of all aspects of the plant. • Establish regular reporting procedures on maintenance • Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged/ deficient equipment, as per the Operation and Maintenance Manual • Brine peak flow monitoring by monitoring the incidence of overflow at pump stations leading to the ponds and accurate recording of flow metering. • Monitoring of surrounding boreholes for potential contamination of surrounding sources or from the brine evaporation ponds.	
Non-sustainability of water sources being over used	• Principle 11 – Climate Change (indirect climate change aspects)	• Routine and proper monitoring of all aspects of the plant. • Proper monitoring of water being pumped / being used or wasted. • Regular checks on all aspects of water usage be reported	• NamWater
Health hazard to animals entering the	• Principle 9 – Protection	• The Plant and ponds need to be properly fenced to keep animals from entering the site.	• NamWater • Public

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
pond area	of Natural Habitats		• Local authorities
Collision of birds with wind turbines	• Principle 9 – Protection of Natural Habitats	• Further assessment and monitoring be done on the effects of the wind turbines on surrounding wildlife, especially birds once the detailed design is completed.	• NamWater
Potential of birds being attracted to the ponds	• Principle 9 – Protection of Natural Habitats	• Further assessment and monitoring be done on the effects of the ponds on surrounding wildlife, especially birds once detailed design is completed.	• NamWater
Fire or explosion of plant	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	• Proper Risk Management Plan and Emergency Plans be in place. • Staff be trained and knowledgeable of the steps and procedures to follow in the event of a fire or explosion onsite. • Proper signs and emergency procedures be placed visible on site.	• NamWater
Used equipment such as RO filter disposal	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservat	• Proper disposal plan be provided on how to dispose of plant equipment, be it; to sell the equipment to be reused / recycled by a prospected buyer; or the disposal at a licenced landfill site. • A disposal certificate must be obtained and signed off by a licenced waste disposal specialist.	• NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	ion of Biological Diversity • Principle 12 – Pollution Prevention and Resource Efficiency		
Improper reuse of the brine / salt-by-product	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 12 – Pollution Prevention and Resource Efficiency	• The use of brine (salt) produced during water treatment for agricultural / other uses is encouraged due to the high levels of nutrients inherently contained therein. • Proper research must be done to make sure that the brine / salt-by-product is used in the correct ways. • In addition, such use must be strictly controlled and monitored with restrictions on specific uses to ensure the health and safety of both the producers and the consumers of the products to which the brine / salt-by-product has been applied (DWAF, 2012).	• NamWater

Table 7: Potential social impacts/risks and the mitigation measures

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
PRE-CONSTRUCTION/DESIGN PHASE			
Human rights (water as a basic need)	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 11 – Climate Change • Principle 7 – Indigenous People. • Principle 13 – Public Health	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts.	NamWater
Land acquisition and potential removal of local people	• Principle 1 (required) – Compliance with National Regulations • Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 4 (required) –	• The land would be owned or leased by NamWater where possible. • Proper protocol will be followed by NamWater to acquire any additional piece of land if necessary. To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts;	• NamWater • Local authorities

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Human Rights (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	• Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples.	
A temporary loss of land and assets to the road servitude or areas to be occupied by project-related surface infrastructure	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts; • Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by	Public Local authorities NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		a project throughout the project's life-cycle. • Ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples.	
CONSTRUCTION PHASE			
A population influx (due to the presence of a construction workforce, as well as an influx of job-seekers into the area), with a possible concomitant increase in social pathologies and increased pressure on existing infrastructure and services.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• The recruitment policy used to employ people on the project must be fair and transparent. • The intention of giving preferential employment to locals is clearly communicated, to discourage an influx of job-seekers from other areas. • Inform local businesses about the expected influx of construction workers so that they could plan for extra demand. • Ensure that employment procedures/ policy of the contractor is communicated to local stakeholders, local farmers and Local Ward Councillor. • Have clear rules and regulations for access to the construction site to control loitering. • Consult with the local private security companies and Police to establish standard operating procedures for the control and removal of loiterers at the construction site. • Construction workers should be clearly identifiable by wearing proper	• Local authorities • NamWater • Public

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.	
Disruption of access routes and daily movement patterns by the construction. Access, traffic and haul roads.	• Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	• Unauthorised access to the construction site must be prevented through appropriate fencing and security. • When the construction period has ended the implementation of adequate rehabilitation measures to return the landscape and other changes to at least its original state. • The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times.	• NamWater • Public • Local authorities
Impacts on sense of place. Such impacts may arise because of the visual intrusion of project-related infrastructure, as well as noise and traffic impacts during construction Visual disturbance from wind turbines and solar panels	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People.	• Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs. • The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities.	• NamWater • Public
Dust caused by the	• Principle 6 (required) –	• Dust suppression is to be conducted	• Contractor

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
construction works and from movement of heavy equipment. During the construction phase, the local community and construction workers would be inconvenienced by the dust generated by the construction works.	• Core Labour Rights • Principle 7 – Indigenous People.	throughout construction. • The use of enclosures, screens and sheeting should be considered to contain dust. • The contractor is to take appropriate measures to minimise the generation of dust because of excavation works. Such measures include frequent spraying of water during low rainfall • Paved or surfaced roads should be used where possible. Where none are available, the required dust suppression measures as stipulated in this ESMP must be implemented. • Speed limits must be enforced in all areas to reduce the generation of dust. • Cover dump trucks before traveling on public roads or relevant as per ECO approved method statement. • Keep soil loads below the freeboard of the truck to minimise fugitive dust. • Revegetate disturbed areas as soon as possible after disturbance. • When feasible, shut down idling construction machinery. • Tighten gate seals on dump trucks. • No burning on site and close to settlements.	• NamWater • Public
Noise and vibration due to the construction works and from movement of heavy	• Principle 6 (required) – Core Labour	• Construction activities should be restricted to daytime hours between 07:00 to 18:00.	• Contractor • NamWater • Public

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
equipment. Movement of heavy machinery on existing local roads may be one of the core problems for the local community during the construction phase.	Rights • Principle 7 – Indigenous People.	• Adjacent households should be consulted and notified of any construction activities that could lead to excessive noise levels in advance. • The households should also be consulted if any night time construction activities are to take place.	
Improper ablution facilities provided	• Principle 6 (required) – Core Labour Rights	• Adequate chemical toilets must be provided for all staff. Alternatively, existing ablution facilities on site can be utilised if available. • The contractor camp: ensure the necessary ablution facilities are provided, with chemical toilets where such facilities are not available at commencement of construction. • Chemical toilets must be empty, kept hygienically clean and secured, they must be emptied / serviced on a regular basis to prevent them overflowing. • Adequate toilets and showers must be positioned at the right places.	• Contractor • NamWater • Local authorities
Socio-cultural differences and conflicts between migrant workers and the local community. Single men predominately occupy the construction camps which could create social	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see	• Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • Loitering of outsiders at either the construction site or at the construction camps should not be allowed. Local	• Local authorities • NamWater • Contractor

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
conflicts, usually because of cultural differences, alcohol abuse or being away from their wives or partners for extended periods of time. A possible reason for conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local community. An influx of unemployed job seekers could also add to the potential for conflict.	also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People • Principle 14 – Physical and Cultural Heritage	Police should be requested to assist in this regard. • Align awareness campaigns with those of other organisations in the area (i.e. the Local Council). • Control of access to construction camp. • Cease construction activities before nightfall, if possible. • Liaison with police, community policing forum and security stakeholders.	
Various social pathologies, such as drug/ alcohol misuse, abuse of woman and children and incidences of sexually transmitted diseases (STI's) may increase with the influx of job-seekers into the area.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality	Social pathologies: • Implement HIV/ AIDS, alcohol abuse, drug abuse, and domestic violence prevention and awareness campaigns in the communities. • The contractors should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a minimum, include programmes to combat HIV/ AIDS and TB.	Contractor NamWater Public Local authorities

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
Crime is another social pathology that may increase. An inflow of construction workers and job seekers may also be accompanied by an increase in crime. Even if specific instances of crime are not because of the newcomers, they may still be ascribed to them by local communities.	and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People. • Principle 13 – Public Health	• The contractor should make HIV/ AIDS and STD awareness and prevention programmes a condition of contract for all suppliers and sub-contractors. Crime: • Regarding safety and security, construction workers should be clearly identifiable. • Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • The construction site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations. • Control of access to construction camp. • Cease construction activities before nightfall, if possible.	
Informal settlements. Once construction is concluded and the camp is vacated, it	• Principle 5 – Gender Equality and Women's	• Once construction is completed and the construction camp vacated, the camp must be demolished to avoid settling of	• Public • Local authorities • Contractor

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
may be illegally occupied.	Empowerment (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	informal residents. Alternatively, if the camp is to be made available for use by other contractors on other projects, it should be "mothballed" until the new occupants take up residence.	• NamWater
Local economy opportunities and economic empowerment. The construction phase of the project will have temporary positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 7 – Indigenous People.	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. As for maximising employment benefits. Also: • Develop register of local SMMEs. SMME skills development as part of Corporate Social Investment (CSI) programme. Community education.	• Public • Local authorities • NamWater
Training and skills transfer. The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Principle 11 – Climate Change • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) –	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for construction related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc.	• NamWater • Contractor • Public • Local authourities

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Core Labour Rights • Principle 7 – Indigenous People	• Identify vulnerable people, youth and women to take part in training and skills transfer programmes.	
OPERATIONAL PHASE			
Reluctance of beneficiaries to use desalinated water	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ongoing community education. • Establish a Stakeholder Liaison Committee.	• Public • NamWater • Local authorities
Sustained future operation, management and maintenance of the plants	• Principle 11 – Climate Change	• Plan the project in such a way to minimise social costs and maximise the benefits discussed.	• NamWater
Risk of skill loss – skilled staff leaving NamWater employ during / after Pilot Phase (Sustainability)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy)	• Local people can be trained part-time during the construction period to attain skills necessary for operation of the plant. • Details of the proposed project should be designed in consultation with community. • NamWater should support or endorse existing development programmes. • Skills transfer should be encouraged by identifying people with the potential	• NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	• Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights	• On-site or in-job training should be encouraged • Promote skills development programmes related to alternative economic activities	
Possible unaffordable water tariff for desalinated water Collapse of the South African Rand (and the N$)	• Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 7 – Indigenous People	• Provide subsidies to the schemes as per normal cross-subsidization norms applied by NamWater.	• Local authorities • NamWater • Public
Theft of solar panels and other materials	• Principle 7 – Indigenous People	• Site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the	• Public • Namibia Police • NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		construction phase. Liaison should also be established with existing crime control organisations.	
Visual impact of the plant, solar panels and wind turbine infrastructure.	• Principle 7 – Indigenous People	• Sensitisation must be done to provide effective mitigation measures and acceptance of the project where possible.	• Public • NamWater
Noise impacts form the plant and wind turbines	• Principle 7 – Indigenous People	• Adequate controls of heavy vehicle traffic to mitigate negative impacts such as noise and sense of place.	• Public • NamWater
Fire or explosion of plant	• Principle 7 – Indigenous People • Principle 13 – Public Health	• Health and safety protocols to be put into place. A method statement is required for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage. • No persons allowed on site other than project employees. • Minimal materials are stored. • All waste disposal bins will be emptied. • Materials are stored in leak-proof, sealable containers or packaging. • The store area is secure and locked. • Basic firefighting equipment must be available on site. Fire extinguishers are serviced and accessible. • The area is secure from accidental damage through vehicle collision, etc. • Emergency and contact numbers of the contractor are available and prominently displayed.	• NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		• All stores will be secured. • Chemical toilets are empty, kept hygienically clean and secured. • 24-hour security will be on site during this period. • All trenches are barricaded with danger tape.	
Plant down-time (no water provision)	• Principle 2 – Access and Equity (see also gender policy)	• Water will be stored in existing / additional reservoirs to have back-up water for a minimum of 48h so that the problem can be fixed within that time frame. • If the problem persists after the 48h, water provision will temporarily switch back to the old water scheme standards.	• NamWater
Water quality changes (+) The project is aimed at improving the quality of water for NW to comply with the new water quality regulations of the Water Resources Management Act of 2013	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Regularly test water to ensure continuous compliance with water quality regulations.	• NamWater
Local employment and job opportunities. The construction phase of the project will have a positive impact on the local labour market. A positive	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable	• Unskilled job opportunities should be afforded to the local communities, as far as possible. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities.	• Public • Local authorities • NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
impact on continued permanent employment will be probable due to the proposed project as the long-term economic viability of the plant will be possible, following the plant expansion. (+)	Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• Individuals with the potential to develop their skills should be afforded training opportunities. • Payment should comply with applicable labour legislation in terms of minimum wages. • Where local labourers are employed on a permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' construction phase positions have become redundant or once the construction phase comes to an end.	
Local economy opportunities and economic empowerment. The operational phase of the project will have positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. As for maximising employment benefits. Also: • Develop register of local SMMEs. • SMME skills development as part of Corporate Social Investment (CSI) programme. • Community education.	• Local authorities • Public (Business Sector) • NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
Improved health. The project will provide the local community with better quality water and this will have a positive impact on the health of the people. (+)	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Regularly test water to ensure continuous compliance with water quality regulations.	• NamWater
Savings on current expenses. Due to the better-quality water, medical expenses would be less (dentists) and less frequent need to replace water usage equipment (Geysers, kettles etc.). (+)	• Principle 11 – Climate Change • Principle 7 – Indigenous People	• Regularly test water to ensure continuous compliance with water quality regulations.	• NamWater
Self-esteem upliftment. With cleaner teeth comes higher self-esteem, less likelihood of depression and social betterment regarding relationships and even job performance. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment	• Regularly test water to ensure continuous compliance with water quality regulations. • Provide training in basic hygiene. • Provide counselling programmes.	• NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	(see also gender policy) • Principle 7 – Indigenous People		
Training and skills transfer. The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Principle 11 – Climate Change • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc. • Identify vulnerable people, youth and women to take part in training and skills transfer programmes.	• NamWater

1.4 PURPOSE OF THE ESMP

In order for NamWater to be successful in procuring the necessary funding for the proposed desalination pilot studies, they are required to comply with certain AF Manuals and Procedural Documents. More specifically in relation to this ESPM, the AF has adopted the Environmental and Social Policy (ESP) in November 2013. This policy ensures that projects and programmes supported by the fund promote positive environmental and social benefits, and mitigate or avoid adverse environmental and social risks and impacts.

Managing these risks is integral to the success of the projects and programmes supported by the AF and the desired outcomes are described in the 15 environmental and social principles of the ESP. In March 2016 the Board amended the ESP to align it with the approved Gender Policy as well.

As part of the AF requirements, the following steps / tasks as outlined in the Environmental and Social Management System (ESMS) Manual needs to be incorporated. This Environmental and Social Management Plan (ESMP) has therefore been compiled for the identification and management of potential environmental and social risks / impacts during the construction, operation, and decommissioning phases of the proposed Pilot Desalination Projects. Best practice is proposed for the generic issues of construction management and supervision as well as the on-going management and operation of the Plant.

In terms of the Environmental Assessment Policy of 1994 and the Environmental Management (Act No 7 of 2007) (EMA), the activities required for the Plant and renewable energy components of the proposed project requires authorization from the Directorate of Environmental Affairs at the Ministry of Environmental and Tourism (MET: DEA).

1.5 SUMMARY OF IMPACTS

The potential negative environmental and social impacts identified in the ESA (construction, operation and decommissioning phases) are localized and temporary with possibility of mitigation actions
The projected environmental impacts for the various phases of the program are summarized below:

Preconstruction/design Phase
No negative impacts are expected during the preconstruction phase. Preconstruction activities include the acquisition of required permits for brine disposal, definition of alignments, and layout of construction limits, location and establishment of equipment storage of staging areas. This phase also includes public consultation and communication with stakeholders and the public on the scope, and possible impacts and proposed mitigation measures of the project to be prepared in this phase include:

- Utilities location and clearance maps
- Project Phasing Programme and Drawings
- Community Relations and Consultation Plan

Construction Phase
The expected negative environmental impacts and risks are generally the same risks encountered in the execution of construction projects involving multiple sites, linear alignments, and extended durations in urbanized and rural settings. The environmental impacts and risks are also compounded by those (risks) associated with the heavy construction, as in treatment plants. The projected impacts and risks all listed in Table 6 above for the construction phase.

Operations Phase
There are no projected major negative environmental impacts during the operation phase. The impacts are projected to be minor, most of which can be readily mitigated. The Impacts are related to storage of chemicals (chlorine, alum), discharge of backwash and sludge from treatment plants, contamination of the water within the distribution mains from leakages and breaks.

Decommissioning Stage
The life cycle of the typical treatment and power plants is 30-40 years. In that period there is the assumption that there would have been a number of modifications to the treatment and power plants and associate transmission and distribution system. Given the nature of the infrastructure is highly unlikely that the infrastructure will be replaced, but rather continuation replacement of aging parts. The general guidelines for environmentally sound decommissioning strategy include:

- *Avoidance of environmental harm during decommissioning;*
- *Likely Land uses are not prejudiced or likely to be prejudiced by residual pollution or potential pollutants on the land;*

- *That all waste material and products are managed and disposed of appropriately; and*
- *The land is not causing or likely to cause off-site environmental harm.*

1.6 IMPLEMENTATION ARRANGEMENTS AND RESPONSIBLE PARTIES

The various entities and their associated roles and responsibilities identified as being central to the adoption and implementation of this SEMP are discussed under the respective headings to follow.

PHASE	RESPONSIBLE PARTY
Planning and design phase	NamWater, DRFN, Consultants, Engineers
Construction phase	NamWater, DRFN, Consultants, Engineers
Operational phase	NamWater, DRFN, Consultants, Engineers
Decommissioning / equipment upgrade phase	NamWater, DRFN, Consultants, Engineers

1.6.1 National Implementing Entity (NIE) – DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

1.6.2 Executing Entity (EE) – NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)

- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments.
- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

1.6.3 Control Officer

Prior to the commencement of the construction phase an independent, suitably qualified and experienced Environmental Control Officer (ECO) shall be appointed by the Contractor to ensure that the mitigation rehabilitation measures are implemented and to ensure compliance with the provisions of this ESMP.

The role of the ECO is to oversee and monitor compliance with and implementation of the construction phase ESMP (i.e. Chapter 2). The ECO is therefore responsible for the following responsibilities:

i) Liaison with the community, Local Village Council, Engineer and Environmental Authorities regarding environmental and social matters related to the project;
ii) Monitoring of all the Contractor's activities for compliance with the various environmental and social requirements contained in this ESMP;
iii) Reviewing of the Contractor's Environmental Method Statements as well as ensuring the local Village Council approval thereof;
iv) Ensuring that the requisite remedial action is implemented in the event of non-compliance;
v) Ensuring the proactive and effective implementation and management of environmental and social protection measures;
vi) Ensuring that a register of public complaints and grievances is maintained by the Contractor and that any and all public comments or issues are appropriately reported and addressed as per the attached Grievance Mechanism;
vii) Routine recording and reporting of environmental and social activities on a monthly basis;
viii) Recording and reporting of environmental and social incidents;
ix) Notifying the Environmental Authorities immediately of any events or incidents that may cause significant environmental and/or social damage or breach the requirements of the ESMP; and
x) Environmental and Social Awareness Training courses to be conducted for the Contractor's workforce.

Site visits and reporting:

The ECO shall visit the site once a week for the first month of the construction phase. Based on the ECO's professional discretion, site visits can then be reduced to a minimum of once every month or as required.

Monthly compliance reports shall be submitted to NamWater and distributed as desired. The compliance report shall speak to the requirements of the ESMP and the project specifications. An external Environmental and Social Audit Report shall be considered six months after construction has been completed and submitted to the Environmental Authorities and NamWater.

2 CONSTRUCTION PHASE

2.1 INTRODUCTION

This ESMP section is to be ***included into all Tender and Contract documentation to ensure that the Contractor is aware of his obligations and is able to price the implementation of these requirements accordingly***. Failure to comply with these requirements could result in penalties or otherwise hold the Contractor accountable for any damages arising from irresponsible behavior or non-compliance with the requirements. This ensures that identified environmental issues receive adequate attention during the planning and construction phase.

2.2 SCOPE

The general principles contained within this section of the ESMP shall apply to all construction related activities. All construction activities shall observe any relevant environmental and social legislation and in so doing shall be undertaken in such a manner as to minimise impacts on the natural and social environment. Best practice shall apply where this ESMP does not describe the management measures for a construction activity. The ECO must be consulted should there be no management measures in this ESMP for a specific construction activity or where there is uncertainty as to how the measures in this ESMP should be implemented. In such an instance the ECO must determine the Best Available Technique(s) to avoid and/ or minimise potential impacts that an activity might have as per available best practice guidelines.

2.3 GENERAL

NamWater, as the Executing Entity (EE), is responsible for:

- Appointing a qualified independent ECO through the contractor;
- Ensuring that the objectives of the ESMP are given effect by including it in all contract documentation;
- Ensuring that all environmental and social impacts are managed in accordance with the ESMP;
- Ensuring that all monitoring and compliance auditing occurs in line with the ESMP;
- Ensuring that the environment is rehabilitated as far as practical to its natural state or existing land use practices; and
- Any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of these activities both in and outside the site boundaries.

With regard to the above, the Contractor shall in addition conduct his activities so as to cause the least possible disturbance to the existing environment, whether natural or man-made, in accordance with all the current statutory requirements. Special care shall be taken by the Contractor to prevent irreversible damage to the environment. The Contractor shall take

adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental and social laws and protection requirements. The Contractor shall supplement these steps with prominently displayed notices and signs in strategic locations to remind personnel of their social and environmental obligations.

A suitably qualified independent ECO shall be appointed by NamWater through the contractor to undertake the following tasks:

- Liaison with Contractor, Interested and Affected Parties (I&APs) / local community; and Engineer regarding environmental and social matters;
- Monitoring of all of the Contractor's activities for compliance with the various environmental and social requirements at regular intervals;
- Routine environmental and social auditing and reporting of the Contractor's performance against the ESMP;
- Reporting of environmental incidents and routine reporting of environmental issues associated with construction activities to NamWater, the Contractor and any relevant environmental authority; and
- Identifying environmental non-conformances and initiating measures to remedy such issues, including the institution of fines against the Contractor.

The Contractor shall construct and/ or implement all the necessary environmental and social protection measures in each area before any construction work may proceed. The Engineer/ ECO may suspend the Works at any time should the Contractor, in the Engineer/ ECO's opinion, fail to implement, operate or maintain any of the environmental or social protection measures adequately. The costs of such suspension shall be to the Contractor's account.

2.4 ENVIRONMENTAL AWARENESS

2.4.1 Environmental, social, health and safety induction course

The Contractor is responsible for informing employees and Sub-Contractors of their environmental and social obligations in terms of the ESMP and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental and social impacts.

The Contractor shall ensure that all his employees, and those of his Sub-Contractors, attend an Environmental, Social, Health and Safety Induction Course. This course shall be structured to ensure that attendees:

- Acquire a basic understanding of the key environmental and social features on the site and its immediate environs;
- Become familiar with the environmental and social controls contained in the ESMP;
- Are made aware of all protected areas and that the trapping, poisoning, and/ or shooting of animals is strictly forbidden. No domestic pets are allowed on site;
- Are informed that natural features (e.g. rock formations, cultural settings e.g. graves) are not defaced or marked for survey or other purposes unless agreed beforehand with the engineer. Furthermore, natural water sources (e.g. streams, groundwater resources) are

not allowed to be used for the purposes of swimming, personal washing, and the washing of machinery or clothes;

- Are made aware of the need to conserve water and minimise waste;
- Receive pertinent, written instructions regarding compliance with the relevant environmental and social management requirements (viz. typical environmental "do's" and "don'ts");
- Are made aware of any other relevant environmental or social matters as deemed necessary by the Engineer/ ECO;
- Are made aware of the importance of preserving archaeological sites;
- Receive detailed training in site health and safety requirements, emergency responses and site evacuation procedures in terms of the Contractor's health and safety plan;
- Are aware that a copy of the ESMP is readily available on site and that all site staff are aware of the location and have access to the document;
- Are aware of the requirements of any approved Method Statements that have bearing on their activities, and where necessary, any specialised training required to ensure compliance with the approved Method Statements has been provided; and
- Are informed that employee information posters, outlining the environmental and social "do's" and "don'ts" (as per the Environmental and Social Awareness Training Course) will be placed at prominent locations throughout the site.

The Environmental, Social Health, and Safety Induction Course should be conducted by the ECO and Contractor's Health and Safety officer, who shall provide the site staff with an appreciation of the project's environmental and social requirements, and how they are to be implemented. All new staff coming onto site after the commencement of construction activities must also attend the Environmental, Social, Health and Safety Induction Course, and refresher courses should be undertaken on a quarterly basis. A detailed record of all training sessions, including a list of attendees must be compiled by the Contractor and submitted to the Project Manager on a regular basis.

The initial Environmental, Social, Health, and Safety Induction Course shall be held within 14 days from the site mobilisation date, and subsequent courses shall be arranged for all new employees arriving after the initial training course, also within 14 days of their arrival.

2.4.2 Toolbox talks

Environmental, social health and safety issues specific to each area of the works, shall form part of the daily toolbox talks in each area. These can be short 10 – 15 minute discussions on the environmental and social sensitivities of the general area and/ or the specific sections that would be worked on, on that day. The foreman responsible will provide feedback to his staff on their day-to-day environmental and social performance and address issues requiring attention and specific actions required. A synopsis of the topics discussed at each area shall be recorded on a register and submitted to the ECO on regular (typically weekly / monthly) basis. Environmental and social matters shall be dealt with in toolbox talks on a regular basis (typically at least once a week).

2.5 SOCIAL AWARENESS

2.5.1 Public Safety and Community relations

The Contractor shall take all reasonable measures to ensure the safety of people in the surrounding area and communities. Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/ or warning signs in English/local language, all to the approval of the Engineer/ ECO.

All unattended open excavations shall be adequately demarcated (fencing shall consist of orange mesh). Adequate protective measures must be implemented to prevent unauthorised access to the Working Area. No firearms shall be permitted on site.

The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the accommodation of a construction workforce on the local communities. The following mitigation and management measures are prescribed in this regard:

- Measures to combat HIV/ AIDS and other social ills:
  - NamWater should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a minimum, include programmes to combat HIV/ AIDS and tuberculosis (TB);
  - The Contractor should make HIV/ AIDS and Sexually Transmitted Diseases (STD) Awareness and Prevention programmes a condition of contract for all suppliers and Sub-Contractors;
  - The Contractor should provide an adequate supply of free condoms to all workers;
  - A voluntary counselling and testing programme should be introduced during the construction phase and continued during operations; and
  - Access at the construction site and camp should be controlled to prevent sex workers from either visiting and/ or loitering at or near these locations.

- Measures to prevent crime:
  - Construction workers shall be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags in order to gain access to the construction site;
  - All construction workers shall at all times wear the required Personal Protective Equipment (PPE); and
  - The Contractor should establish clear rules and regulations for access to the construction site and offices to control loitering. Consultation should occur with the local Village Namibian police branch to establish standard operating procedures for the control and/ or removal of loiterers.

- Measures to reduce traffic related incidents:
  - Ensure that road junctions have good sightlines;

- Transport the materials in the least amount of trips as possible, whilst being careful of overloading vehicles;
- Limit speed both on and off the site;
- Adhere to the speed limit; and
- Implement traffic control measures where necessary.

2.5.2 Employment Creation and skills development

Job creation, inward migration of workers and accommodation of a workforce within a small community have the potential to result in significant social impacts. NamWater and the Contractor must approach human resource management in a careful, cooperative and considered fashion so as to enhance the positive impacts, whilst minimising negative impacts associated with construction projects.

Given the proximity of the proposed project to Bethanie, the community should be given special consideration in terms of the benefits arising from the project. In order to enhance the benefits of employment creation for local communities, it is recommended that the following measures be implemented:

- The Contractor shall establish a formal and organised recruitment process;
- Close collaboration must take place between the local Village Council, local Village Council Development Committee, NamWater and the contractor in relation to employees being appointed on contractual bases for this project;
- The Contract shall be encouraged to employ local labour (i.e. from Bethanie) where possible;
- The Contractor shall identify vulnerable and marginalised people and provide assistance in the recruitment process;
- The Contractor shall be encouraged to recruit Namibian labourers;
- Recruiting by the Contractor must be conducted through a central office and no on-site hiring should be allowed;
- The Contractor shall inform job seekers that they are hired for a contract period only;
- The Contractor shall be encouraged to source construction materials locally as far as possible; and
- The Contractor shall be encouraged to make use of local sub-contractors.

In regards to skills, training the following are recommended:

- The Contractor shall establish a formal and organised skills training process;
- Close collaboration must take place between the local Village Council, local Village Council Development Committee, NamWater and the contractor in relation to employees being trained various skills from basic, intermediate to more advanced levels where practical for this project;
- The Contractor must do a skills audit to attain various skills needed in the local community.
- Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc.

- The Contractor must identify vulnerable people, youth and women to take part in training and skills transfer programmes.

2.5.3 Working times

The Contractor shall restrict construction activities to the hours of 06h30 - 18h00 during summer and 07h00 - 17h30 during winter on Mondays to Saturdays and no work will be permitted on Sundays or public holidays.

2.6 METHOD STATEMENTS

Any Method Statements required by the Engineer/ ECO or called for by the Project Specification shall be produced within such reasonable time as specified by the Engineer/ ECO or as stipulated in the Project Specification. Please refer to **Appendix B** for a generic example of a method statement. The Contractor shall not commence the activity until the Method Statement has been approved, except in the case of emergency activities. The Contractor shall allow the Engineer/ ECO a one week period for the review and approval of the Method Statement. Such approval shall not be unreasonably withheld.

The Engineer/ ECO may require changes to a Method Statement if the proposal does not comply with the Specification or if, in the reasonable opinion of the Engineer/ ECO, the proposal may result in, or carries a greater risk of, damage to the environment in excess of that which can be tolerated.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract or any other law except where this is specifically stated in the method statement.

Method Statements that shall be provided by the Contractor 14 days prior to the mobilisation on site include:

1. Mobilisation plan, covering:
    a. The location and layout of all offices, storage containers, gates and fences, fuel storage areas and protection bunds, material lay-down areas, ablution facilities, carpentry areas, hazardous chemical storage facilities, wash bays, workshops and works service and maintenance areas, oil separators and grease traps, storm-water layout, first aid facilities, recess, training, eating and meeting areas, central waste storage areas, access/ haul roads and any other facilities associated with the Contractor's yard;
    b. Security and access control to the site;
    c. The design and location of all waste storage facilities, in particular the central waste storage area;

d. The central waste storage area shall include separate, weather proof, water-tight vessels/ skips for the disposal of hazardous waste and contaminated soil recovered during spills and for general waste respectively;
e. The system of collection and disposal of wastes, including the name and location of the point of final disposal, to an appropriate landfill site;
f. Initiatives for the control and recovery of litter on and around the Site and Contractor's yard;
g. Fuels and fuel spills: Methods of refuelling vehicles and details of methods for fuel spills and clean-up operations;
h. Sedimentation and Erosion Control: Sedimentation and erosion control of bulk earthworks and the management of sediment into rivers;
i. Stormwater management: Provisions to manage stormwater during the construction phase; and
j. Method of undertaking blasting.

2. Waste Management Plan, covering:
    a. The design and location of all waste storage facilities, in particular the central waste
    b. storage area;
    c. The central waste storage area shall include a separate, weather proof, water tight
    d. vessel for the disposal of hazardous waste and contaminated soil/water recovered
    e. during spills;
    f. The system of collection and disposal of wastes, including the name and location of
    g. the point of final disposal to an appropriately registered landfill site;
    h. Initiatives for the control and recovery of litter on and around the Site and
    i. Contractor's yard;
    j. The recovery, handling and disposal of construction and organic (vegetation debris)
    k. wastes; and
    l. Initiatives implemented to minimise, reuse or recycle all wastes generated during
    m. construction.

3. Emergency Preparedness Plan, covering:
    a. Contact details for relevant personnel, as well as their designations for:
        i. Emergency services and local authorities;
        ii. Private emergency services;
        iii. Contractor's personnel;
        iv. Engineer's personnel; and
        v. Employer's personnel.
    b. Fire Protection Plan, covering:
        i. The type and location of all fire protection equipment including fire beaters, fire extinguishers, knapsack sprayers, rake-hoes, fire-fighting tankers, etc.
        ii. Details regarding procedures to be followed in responding to a fire.
        iii. Fire prevention initiatives, including designated smoking areas, preventing the lighting of fires on site, the proximity of fire extinguishers during hot work, the storage of explosive or flammable substances, etc.
    c. Evacuation Plan, covering:

i. How and to where personnel and site staff will be evacuated in the event of a fire, flood, bomb threat or other similar situation.

d. Spill Response Plan, covering:
   i. The protocols to be followed in the event of a large spill, including the recovery or neutralising of chemical spills on soil and in water environments;
   ii. Day-to-day measures and protocols to be followed to prevent the spillage of potentially hazardous chemicals, with a focus on diesel and petrol fuel.

e. Inclement Weather Preparedness Plan, covering:
   i. Measures to be taken ahead of forecasted inclement weather that may result in high winds, heavy rains and flooding with the potential to cause damage to the works. Measures may include the removal of stationary equipment and stored chemicals from low-lying or excavated areas or the securing and / or removal of plant, waste, portable toilets ahead of such an event. Emergency preparedness earthworks initiatives used in the protection of the works areas where necessary should also be briefly described here.

2.7 ENVIRONMENTAL CONSIDERATIONS PERTAINING TO SITE LAYOUT

2.7.1 Employee eating and recess areas

The Contractor shall identify a suitable area, which is shaded and away from construction noise and dust, where employees can eat and take work recesses in relative comfort. The eating areas shall be provided with scavenger proof rubbish bins which are to be emptied into the central waste storage vessel/ skip daily. Potable water and other sanitary conveniences shall also be located within reasonable range of the designated eating area. The Contractor shall prevent his employees from eating or recessing anywhere else but in the designated eating area Security Guards.

Security guards that would look after construction equipment, materials and plant at night time shall not be allowed to leave the construction yard. They must be provided with an office to shield them from the weather. They shall be bound by the conditions contained in this EMP. Security guards must therefore be made aware of the conditions of the ESMP, especially with relation to 'no-go' areas, fires on site (refer to chapter 2.7.14), health and safety and protection of fauna and flora.

2.7.2 Ablution facilities

Temporary/ portable toilets shall be supplied by the Contractor for the workers at a minimum ratio of 1 toilet per 15 workers and be within walking distance of the work area. The toilets shall be placed at appropriate locations to the approval of the Engineer/ ECO. Toilets shall be kept in a good state of repair and shall be serviced at intervals sufficient to ensure that they are kept in clean and sanitary condition. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment is prohibited. Each toilet shall be stocked with toilet paper at all times. All toilets shall be secured to the ground to ensure that they do not overturn during high winds or for any other reason.

Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited, other than at the facilities provided.

2.7.3 Access, traffic and haul roads

The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times. Construction traffic shall be controlled to ensure minimal disruption to normal road users. All existing access roads that may be affected during construction shall be kept open and in a good state of repair, where this is not possible, unobstructed and safe alternative access routes through the Works must be provided under the guidance of the ECO.

The following mitigation measures are further proposed to limit the impact of traffic in the area:

- Access roads shall be widened to the minimum width required and should not exceed 5m;
- New roads shall not be constructed if the quality of existing roads deteriorates. Existing roads shall be repaired and maintained for the duration of the construction phase and beyond;
- Road construction methods should ensure good road surfaces to preclude vehicles driving off road to find smoother surfaces with less corrugations or potholes;
- The area to be cleared for road construction shall be as small as possible;
- Road surface shall be regularly assessed and upgraded where appropriate;
- No operator will operate any equipment when he is under the influence of alcohol;
- Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts etc. immediately (preferably offsite, if not offsite the ground surface must be protected by impermeable material and/ or drip trays);
- Ensure that road junctions have good sightlines;
- Transport the materials in the least amount of trips as possible;
- Limit speed both on and off the site;
- Adhere to the speed limit;
- Implement traffic control measures where necessary.
- Good driving and adherence to safety rules shall be adhered to at all times;
- Drivers must keep their headlights on when driving on gravel roads;
- Drivers must have the correct licence and training for the vehicles they are driving; and
- The following minimum standards for access roads should be followed:
    - Enter and exit roadways and construction areas should be demarcated at the entrances;
    - Erect signage to warn motorists about construction activities and heavy vehicle movement where appropriate;
    - Use 3-point turns and not U-turns and confine turning to the road; and
    - Prevent shortcuts between roads.

No new parking bay, haul or access road or passage of any sort shall be opened or be caused to be opened without the prior consent of the Engineer/ ECO. Establishing new borrow pits are strictly prohibited. Any contraventions of this clause shall result in penalisation.

2.7.4 Solid waste management

The Contractor shall provide sufficient number of scavenger proof rubbish bins with secured lids. Rubbish bins shall always be placed in pairs, to ensure that one is always present while the other is being emptied. As a minimum, rubbish bins shall be located at every point of entry/ exit to the site, any building, work area, ablutions facility or recess area. Areas where rubbish is likely to be generated in higher quantities shall be equipped with additional rubbish bins according to the activities occurring there and the volume of waste being generated. Areas requiring additional rubbish bin will include for example:

- Training and meeting facilities;
- Workshops;
- Stores;
- Canteens and eating areas;
- Materials laydown areas;
- Any work areas where outfitting (electrical, plumbing, mechanical) of structures is occurring (as required);
- Any mobile teams carrying out work away from the main site infrastructure, for example pipe or electrical installation teams, road building and maintenance teams, etc., shall carry a rubbish bin with them at all time and return all waste collected to the central storage area at the end of a day's work; and
- Any other area where an accumulation of litter and rubbish is noted or as instructed by the ECO.

No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the Site. Bins shall be emptied daily or as required. The waste may be stored temporarily on site in a central waste area that is weather and scavenger proof, as approved by the Engineer/ ECO. The Contractor shall, at his own cost, make available the time and resources required in recovering any litter or other wastes that have accumulated or have been dispersed as a result of his activities on the Site. The ECO shall monitor this strictly and institute strict penalties in the event of non-compliances.

The central waste storage vessel/ skip shall be emptied weekly or as necessary. All solid waste shall be disposed of at the closest registered waste disposal site. A copy of the waste disposal certificates shall be submitted to the Engineer/ ECO for record purposes.

2.7.5 Fuel and oil

The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. The tanks or mobile bowsers must be in good working order (i.e. not leaking). The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas. The tanks or bowsers shall be situated on a smooth impermeable surface

(concrete slab or 250 micron plastic sheeting covered with at least 50mm of sand) with an earth bund. The impermeable lining shall extend to the crest of the bund. The volume of the bunded area shall be 130% the volume of the combined tank volumes stored therein. Provision shall be made for refuelling at the fuel storage area, by protecting the soil with an impermeable surface (similar to that used for the storage area itself). The tanks and/ or bowsers shall be inspected daily for any leaks. If they are leaking, either the leaks must be fixed immediately or the bowser/ tanks must be replaced.

The Contractor shall prevent unauthorised access to the fuel storage area. No smoking shall be permitted in the vicinity of the fuel storage area. The Contractor shall ensure that there are adequate fire-fighting provisions located at the fuel storage area.

Should a mobile fuel bowser be used, all refuelling shall occur with appropriate measures in place to prevent spillages; these may include the use of drip trays, funnels, non-drip dispensing nozzles, and any other similar device. Regardless of the preventative measures in place, all mobile fuel bowsers shall carry a spill-kit that is adequately sized to contain at least a 200 litre spill, at all times.

2.7.6 Equipment maintenance and storage

All vehicles and equipment shall be kept in good working order and shall be operated by designated and competent operators. Leaking or damaged equipment shall be repaired immediately or removed from the Site. Where emergency, *in situ,* maintenance operations are required the Contractor shall ensure that the soil or vegetation does not become contaminated. Drip trays shall be provided in construction areas for stationary and parked plant as well as for the emergency servicing of vehicles. Drip trays shall be inspected and emptied daily, or as required. The contents of the drip trays shall be disposed of at an appropriately authorised facility and proof thereof shall be submitted to the Engineer/ ECO.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only during which the use of detergents for washing shall be restricted to low phosphate and nitrate containing, low foaming type detergents. Washing of equipment will only be allowed in a wash bay, at the site camp, approved by the Engineer/ ECO.

The Contractor shall ensure that oil and lubricant containers are stored in an area where the ground has been protected. The containers shall be inspected regularly to ensure that no leakage occurs. When oil/ lubricants are dispensed, the proper dispensing equipment shall be used, and the storage container shall not be tipped in order to dispense the oil/ lubricant. The dispensing mechanism of the oil/ lubricant storage container shall be stored in a waterproof container when not in use. The Contractor shall take all reasonable precautions to prevent accidental and incidental spillage during the use of oils.

In the event of oil/ lubricant or other hazardous spill, the source of the spillage shall be isolated, and the spillage contained. The Contractor shall clean up the spill by removing the contaminated soil to the hazardous waste vessel/ skip and the application of absorbent material

to the affected area. Treatment and remediation of the spill area shall be undertaken to the reasonable satisfaction of the Engineer/ ECO.

2.7.7 Stockpiling and stockpile areas

Plant (i.e. machinery) and materials shall be stored within the demarcated construction camp or batching areas. Where this is not feasible, the Engineer/ ECO will identify additional sites for stockpiling within the Working Area. Where possible, stockpiled materials shall be stored off the ground on scaffolding and care shall be taken to minimise disturbance to the vegetation and topsoil.

Soil, sand, and gravel stockpiles shall be convex in shape and shall be located so as to cause minimal disturbance. Stockpiles shall be so placed as to occupy the minimum width compatible with the natural angle of repose of the material, and measures shall be taken to prevent the material from being spread over too wide a surface. The Contractor shall ensure that all stockpiles do not result in the damming of water or run off, or are themselves washed away. Stockpiles shall be placed to not obstruct or pollute any storm water or drainage paths.

2.7.8 Materials

a) Materials handling, use and storage

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions, including “no-go” areas and designated haul routes.

All material shall be stored within the designated Site boundaries and all material stockpiles shall be located no less than 20m from any water resource. The Contractor shall ensure that all material lay-down areas, workshops and stores, including temporary lay-down areas within the Works, are kept in a neat and orderly fashion on a daily interval, and to the satisfaction of the Engineer/ ECO. The Contractor shall set aside the time and resources required to remedy any contraventions of this clause at his own expense.

Materials shall be appropriately secured and covered to ensure safe passage between destinations. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

b) Hazardous substances

Hazardous chemical substances used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation. Potentially hazardous substances shall be stored, handled and disposed of as prescribed by the Engineer/ ECO.

The Contractor shall provide a separate weather-proof, impervious vessel/ skip at the central waste storage area for the temporary storage of hazardous, potentially hazardous and

contaminated materials. Waste from this vessel/ skip shall be disposed of at a landfill site that is registered to receive such waste. A copy of the Certificate of Disposal issued by the landfill shall be submitted to the Engineer/ ECO after every deposit.

2.7.9 Cement and concrete batching

The batching of concrete shall take place on a smooth, impermeable surface (plastic) and shall be enclosed with a bund and sloped toward a sump to contain any spillages. Concrete batching shall take place at least 20m away from any water resource, e.g. vegetated drainage lines, to avoid contaminated water and/ or sediment entering the resource. All waste water resulting from batching of concrete shall be contained and disposed of appropriately and shall not be discharged into the environment unless treated to acceptable standard, as determined by the Engineer/ ECO. Where concrete trucks are used, the Contractor shall ensure that dumping of the drum-wash does not occur directly onto the ground. If needed, facilities for the handling of the concrete contaminated wash-water shall be established to the satisfaction of the Engineer/ ECO. Any spillages of concrete or concrete-truck-drum-wash-water shall be cleaned-up immediately and disposed of through the solid waste disposal system.

The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the pour and disposed of as part of the solid waste disposal system. Empty cement bags shall be collected continuously and stored in temporary weatherproof containers, where they are protected from dispersion by wind and shall be disposed of regularly via the solid waste disposal system.

2.7.10 Blasting

Blasting is to be executed by a suitably qualified person with all the relevant blasting certificates/ registrations. All relevant Namibian blasting regulations shall be strictly adhered to. Controlled blasting techniques shall be employed to minimise dust and fly rock (i.e. loose pieces of rock that could be propelled into the air) during blasting.

All communications should go through proper channels of notification of the intend to blast so that proper safety measures can be put in place with the proper local community officials.

2.7.11 Dust

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activity, to the satisfaction of the Engineer/ ECO. Dust suppression measures shall be agreed upon in consultation with the Engineer/ ECO. Appropriate dust control measures include the following:

- Construction vehicles shall only use designated roads;
- Dust carrying materials shall be secured and properly covered on transportation vehicles before they leave the site; and

- During high wind conditions the contractor must make the decision to cease works until the wind has calmed down.

2.7.12 Noise

The Contractor shall limit noise levels by implementing the following:

- Install and maintain silencers on machinery;
- Appropriate directional and intensity settings are to be maintained on all hooters and sirens;
- No amplified sound shall be allowed on Site other than in Emergency situations; and
- Drivers and operators are to be instructed to not use their hooters unless absolutely required (i.e. operators of machinery should not use hooters for the purposes of general communication, which is typically seen on construction sites).

2.7.13 Trenching (only where applicable)

Trenches where envisaged shall be demarcated appropriately, using orange mesh, and securely and regularly monitored during operations to ensure that pedestrian (and vehicular) access to these areas is strictly prohibited. Where appropriate, sign boards, alerting pedestrians and road users to the potential dangers presented by the construction activities, shall be erected. The Contractor shall ensure that the time a trench is left exposed is kept to a minimum, and that open trenches are inspected on a daily basis for animals which may have fallen or become trapped. Animals found trapped shall be rescued and released into the wild. If poisonous animals/ reptiles such as snakes are found, the DNP and/ or a snake handler must be contacted to rescue the snake/ animal. A local snake handler must be identified before works start and his contact details shall be readily available.

2.7.14 Fire control

Fires are only permitted in designated areas and shall not be left unattended. These areas must first be discussed and approved by the DNP officials. If such areas are approved by the DNP officials, cooking places shall be located at a safe distance from fuel/ hazardous materials storage area and vehicle parking areas. All grass and bushes shall be removed around fireplaces. Fire extinguishers shall be readily available in the construction camp. Any fires that occur outside of designated areas shall be reported to the Engineer/ ECO immediately. Employees shall be made aware that the collection and removal of firewood is prohibited, except where indicated by the contractor as clearing takes place. The Contractor shall either provide firewood or to limit the use thereof; provide gas or fuel efficient stoves. Smoking shall not be permitted in those areas where there is a fire hazard. Burning of waste for disposal purposes is not permitted.

The Contractor shall be responsible for ensuring that immediate and appropriate actions are taken in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The Contractor shall ensure that there is at least one fire extinguisher at the entrance to the site and at the recess area. A fire extinguisher shall be present whenever undertaking any

form of hot work, i.e. welding, gas cutting, angle grinding, etc. All transport, earth moving equipment, and materials handling equipment on the Site shall be fitted with fire extinguishers. All fire extinguishers shall be serviced at the specified intervals and all other fire-fighting equipment shall be maintained in a good state of repair.

2.7.15 Emergency procedures

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills, which shall include notifying the Engineer/ ECO. The Contractor shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times. Treatment and remediation of spills shall be done to the satisfaction of the Engineer/ ECO.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The affected areas shall be cordoned off and secured. The Contractor shall ensure that there is always sufficient supply of absorbent material on Site to absorb/ breakdown or encapsulate at least a 200ℓ liquid hydrocarbon spill. Any soil contaminated by such a spill must be removed and disposed of at an appropriately registered waste site.

Emergency equipment including spill kits and fire extinguishers shall be positioned at accessible locations near to areas or facilities where such emergencies may arise.

2.7.16 Erosion, water quality, and storm water control

The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation. The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works because of storm water flows. A preventative approach must be adopted whereby the extent of clearance and disturbance is limited to those areas required to complete the Works (i.e. a working corridor of 15 m). If required, the Contractor shall establish necessary storm water control mechanisms in agreement with the engineer, to effectively control the movement of water onto, through and off the construction site.

The Contractor shall establish, in agreement with the Engineer/ ECO, a suitable mechanism, where necessary, for containment and treatment of contaminated water emanating from the Works or associated activities, i.e. settlement or sedimentation ponds/ oil separators. A plan must be submitted and approved by the ECO/ Engineer.

2.8 COMPLIANCE AND PENALTIES

2.8.1 Compliance

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the works.

It is thus required that the Contractor shall comply with the environmental requirements on an on-going basis and any failure on his part to do so will entitle the Engineer/ ECO to certify the imposition of a penalty, as detailed below, if such non-compliance is not corrected within a period of one week of notification thereof.

2.8.2 Penalties

Penalties will be issued for certain transgressions. Penalties may be issued per incident at the discretion of the Engineer/ ECO. Such penalties will be issued in addition to any remedial cost incurred as a result of the non-compliance with this Specification. The Engineer/ ECO will inform the Contractor of the contravention and the amount of the penalty, and shall be entitled to deduct the amount from the monies due under the Contract.

Penalties for the activities detailed below, will be imposed by the Engineer/ ECO on the Contractor and/ or his Sub-Contractors.

a)	Any employees, vehicles, or things related to the Contractor's operations operating outside the designated boundaries or a "no-go" area.	N$ 5,000
b)	Persistent and un-repaired oil leaks from machinery.	N$ 2,000
c)	Persistent failure to monitor and empty drip trays timeously.	N$ 2,000
d)	The use of inappropriate methods for refuelling, resulting in spillages.	N$ 2,000
e)	Litter on site associated with construction activities.	N$ 2,000
f)	Deliberate lighting of illegal fires on site.	N$ 2,000
g)	Any employee eating meals on site, outside of the defined eating area.	N$ 2,000
h)	Employees not making use of the site ablution facilities.	N$ 2,000
j)	Failure to empty waste bins on a regular basis.	N$ 200
k)	Unauthorised removal of vegetation.	N$ 500
l)	Hunting, trapping and collection of animals (per unit taken).	N$ 15,000
m)	Failure to implement specified noise controls.	N$ 2,000
n)	A spillage, pollution, fire or any damage to the environment resulting from negligence on the part of the Contractor.	N$ 5,000
o)	Damage to vegetation or ground arising from equipment leaving designated haul or access routes.	N$ 5,000
p)	Failure to submit and, or proceeding with work without having or deviating from an approved method statement, for those task requiring a method statements in terms of the EMP.	N$ 5,000

For each subsequent similar offence the penalty shall be doubled in value to a maximum value of N$ 20,000. The Engineer/ ECO shall be the judge as to what constitutes a transgression in terms of this clause.

2.9 MEASUREMENT AND PAYMENT

2.9.1 Basic principles

Except as specified below or in the Project specifications or as Scheduled, no separate measurement and payment will be made to cover the cost of complying with the provisions of this ESMP and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.

2.9.2 Scheduled items

All requirements of the environmental management specification

All work not measured elsewhere, associated with complying with any requirement of the environmental management Specification shall be as a measured sum. The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Schedule of Quantities or shown on the drawing(s).

Method statements: Additional work

No separate measurement or payment will be made for the provision of Method Statements but, where the Engineer/ ECO requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the work required, provided it could not reasonably have been foreseen by an experienced Contractor.

Work "required by the project specification"

Where a clause in this Specification includes a requirement as "required by the Project Specification", measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment clause of the Project Specification.

2.10 SUMMARY OF CONSTRUCTION PHASE MANAGEMENT ACTIONS

Table 1: Construction Phase Management Table

Aspect	Management Objective	Management actions	Responsibility
Responsible management	To ensure that construction activities are carried out so as to cause the least possible disturbance to the existing amenities, whether natural or man-made.	• The Contractor shall take adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental laws and protection requirements. • A suitably qualified independent ECO shall be appointed by the Contractor. • The Contractor shall construct and/or implement all the necessary environmental protection measures in each area before any construction work may proceed.	Contractor
Environmental awareness	To ensure that all employees and Sub-Contractors are informed of their environmental obligations.	The Environmental, Health, and Safety Induction Course should be conducted by the ECO and Contractor's Health and Safety officer.	ECO
		The foreman responsible will provide feedback to his staff on their day-to-day environmental performance and address issues requiring attention and specific actions required.	Contractor
Safety to the public	To reduce the risks posed by the project to the public.	• Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs in English. • No firearms shall be permitted on site without the prior approval of the Project Manager. The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities.	Contractor
Human resource and opportunities management	To ensure that job creation, inward migration of workers and accommodation of a workforce within a small community does not result in significant social impacts.	In order to enhance the benefits of employment creation for these communities, it is recommended that the Contractor shall establish a formal and organised recruitment process in line with this EMP.	Contractor
	Construction activities shall be restricted to specified hours in order to limit disturbance to the public.	The Contractor shall restrict construction activities to the hours of 6h30 - 17h00 during summer and 07h00 - 17h00 during winter on Mondays to Saturdays and no work will be permitted on Sundays or public holidays.	Contractor

Aspect	Management Objective	Management actions	Responsibility
Dust	To limit dust levels.	Appropriate dust control measures must be implemented.	Contractor
Noise	To limit noise levels.	Appropriate measures shall be implemented to limit noise levels.	Contractor
Method statements	To ensure effective and formal communication between the Project Management Team and the Contractor on construction issues throughout all stages of the project	System regarding method statement compilation, submission, review and approval to be rigorously implemented.	Contractor / ECO
		Method Statements that shall be provided by the Contractor 14 days prior to the mobilisation on site include: • Mobilisation plan; and • Operational and rehabilitation plan.	Contractor / ECO
Environmental considerations pertaining to site layout	Suitable area identified where employees can eat and take work recess.	• The Contractor shall identify a suitable area, which is shaded and away from construction noise and dust, where employees can eat and take work recesses in relative comfort. • The eating areas shall be provided with scavenger proof rubbish bins, potable water and other sanitary conveniences.	Contractor
Ablution facilities	Temporary toilets shall be provided by the contractor.	• Temporary / portable toilets shall be supplied by the Contractor for the workers at a maximum ratio of 1 toilet per 15 workers and be within walking distance of the work area. • The toilets shall be placed at appropriate locations to the approval of the Engineer / ECO. • Toilets shall be kept in a good state of repair and shall be serviced at intervals sufficient to ensure that they are kept in clean and sanitary condition.	Contractor
Access, traffic and haul roads	Construction traffic shall be controlled to ensure minimal disruption to normal road users.	The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times.	Contractor
Solid waste management	To ensure that there is no illegal disposal of waste.	• The Contractor shall provide sufficient number of rubbish bins with secured lids. • No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the Site.	Contractor
Fuel and oil	To ensure that all liquid fuels are stored appropriately and adequate fire-fighting equipment is stored on site.	• The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. • All tanks and/or mobile bowsers shall be situated in a bunded area.	Contractor

Aspect	Management Objective	Management actions	Responsibility
		• The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas.	
Equipment maintenance and storage	All vehicles and equipment are kept in good working order.	• Leaking or damaged equipment shall be repaired immediately or removed from the Site. • Drip trays shall be provided in construction areas for stationary and parked plant as well as for the emergency servicing of vehicles.	Contractor
Stockpiling and stockpile areas	All plant and materials shall be stored in designed areas to minimise the disturbance to vegetation and topsoil.	Plant and materials shall be stored within the demarcated construction camp or batching areas.	Contractor
Materials handling, use and storage	All delivery drivers are informed of the on-site procedures and restrictions.	• The Contractor shall ensue that any delivery drivers are informed of all procedures and restrictions, including “no-go” areas and designated haul routes. • All material shall be stored within the designated Site boundaries.	Contractor
Hazardous substances	Any hazardous substances are stored appropriately.	• Hazardous chemical substances used during construction shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.	Contractor
Cement and concrete batching	Cement and concrete batching takes place in designated areas.	• The batching of concrete shall take place on a smooth, impermeable surface (plastic) and shall be enclosed with a bund and sloped toward a sump to contain any spillages. • The Contractor shall take all reasonable measures to prevent the spillage of cement / concrete during batching and construction operations.	Contractor
Trenching	Trenches are appropriately demarcated and secured.	Trenches shall be demarcated appropriately and securely and regularly monitored to ensure that pedestrian (and vehicular) access to these areas is strictly prohibited.	Contractor
Fire control	To reduce the risk of fires	• Fires are only permitted in designated area and shall not be left unattended. • Fire extinguishers shall be readily available.	Contractor
Emergency procedures	All employees are aware of emergency procedures.	• The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills. • The Contractor shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times.	Contractor
Erosion, water	To prevent or remediate damage to the	• The Contractor shall take all reasonable steps to prevent or remediate	Contractor

Aspect	Management Objective	Management actions	Responsibility
quality, and stormwater management	environment resulting from the Works in the form of erosion and sedimentation shall be taken.	damage to the environment resulting from the Works in the form of erosion and sedimentation. • The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works as a result of storm water flows.	
Penalties	To ensure that environmental requirements are strictly adhered to.	Penalties will be issues for certain specified transgressions.	Contractor

3 OPERATIONAL PHASE

3.1 INTRODUCTION

The Operational Phase Section of the Environmental Social Management Plan relates to the management and mitigation measures required to ensure that the proposed Pilot Desalination Study with Renewable Energy is operated in a manner that demonstrates responsible, precautionary environmental and social management.

The Operational ESMP will address specific areas of concern in terms of the long-term environmental and social management of the affected environment and community and is intended to serve as a guide to the on-going management of the Desalination Plant as well as the affected environment. The Operational ESMP will therefore aim to provide NamWater with the necessary tools to ensure that the potential impacts on the natural environment and the community due to the Desalination Plant during operation are minimised. Moreover, it will aim to ensure that the infrastructure is operated and maintained in an environmentally and socially sensitive and sustainable manner, and that the operation of the infrastructure does not result in reasonably avoidable environmental and social related impacts.

However due to the exact methods of operation not yet known at this stage, NamWater together with the operational team need to amend and adjust this Operational ESMP in order to be more site specific.

The general operational information is summarised in tabular format illustrating the activity, aspect, impact, mitigation measure, performance indicators, resources, schedule and verification. These criteria are listed and explained below:

The following components are identified/ described:

- **Activity**: component/ activity of the project for which the impact has been identified;
- **Aspect**: the aspect of the above activity which will be impacted;
- **Impact**: the environmental impact identified and to be mitigated;
- **Mitigation measure**: measures identified for implementation in terms of environmental management to reduce, rectify or contain the identified environmental impact – mitigation is divided into the following:
    - **Objective**: desired outcome of mitigation measure,
    - **Mechanism**: method of achieving the objective;
- **Performance indicators**: outcomes that will indicate achievement of objective/s;
- **Responsibility**: party or parties identified for implementation of mitigation measure/s;
- **Resources**: available resources to aid implementation of mitigation;
- **Schedule**: timeframe in which identified impact and mitigation measure is anticipated to occur; and
- **Verification**: party or parties identified as responsible for review and assessment of final outcome.

3.2 MAINTENANCE PROCEDURES

The optimal operation and effective maintenance of the Desalination Plant are important in protecting the environment and ensuring that resources are not wasted and environmental and social incidents arising out of equipment or infrastructure failures, are avoided. A more detailed Operational and Maintenance (O&M) Manual will be compiled for the Plant by a suitable qualified and experience person in regards to the specific O&M of a Desalination Plant as well as the renewable energy technicalities. The manual will provide detailed guidance on the operation of all machinery and associated systems as well as related maintenance procedures, including maintenance schedules. Implementation of this manual by NamWater will facilitate the proactive management of potential risks and thus result in impacts on the receiving environment being averted. Accordingly, the O&M Manual shall be regarded as an integral component of the ESMP.

The O&M Manual will include, but not be limited to, the following sections:

- Works Safety including personnel safety and equipment safety;
- Equipment summary;
- Works description;
- Disposal of waste (e.g. brine);
- Works operation, including:
    - Commissioning start up (Pre-start-up checks), and
    - Normal operation (Operation and daily operation checks).
- Maintenance schedules, including
    - General care and maintenance,
    - Maintenance log,
    - Daily operating checks,
    - Monthly Maintenance Procedures, and
    - Annual Maintenance Procedures.
- Equipment replacement schedules, including
    - Proper removal / recycling and disposal of life-ending equipment;
    - Proper replacement of new equipment; and
    - Re-use of equipment elsewhere where possible.

The maintenance procedures set out in the O&M Manual, will provide specific guidance in terms of the monitoring and maintenance of the key mechanical and electrical equipment. These procedures will specify the equipment item and specific component of each piece of equipment requiring checking, the scope and nature of the check that is to be carried out including detailed instructions related to the specific check, and the programme for conducting each check. Completed schedules will be kept on site to provide a complete compliance record.

3.3 EMERGENCY PREVENTION, PLANNING, AND RESPONSE

The O&M Contractor shall compile an emergency plan for approval by NamWater. The plan shall provide procedures for the following potential emergency scenarios and response requirements:

- A major spill on site;
- A major spill *enroute* (i.e. traffic accident);
- The rupture of chemical storage tanks;
- A site evacuation procedure (in the event of bomb threat or fire);
- Medical emergency (including the need to airlift a patient);
- Fire inside the facility;
- Major pipe burst; and
- An explosion (i.e. transformers).

For all emergency scenarios described above, the O&M Contractor shall identify suitable measures to reduce the risks of such emergencies occurring and provisions required to respond to such emergencies effectively, or until emergency services can intervene.

A copy of the emergency plan shall be provided to NamWater, the relevant emergency services, one onsite and one off-site copy. The emergency plan shall contain layout drawings of the plant which shows general access information and layout, such as roads, access ladders, doors, manholes, alternative escape routes, fire extinguishers, first aid provisions, water access points, etc. The plan will also show the location of potential hazards, such as LPG or Chlorine gas bottles, chemicals stores (including the type, max volume and nature of chemical stored there), fuel and oil stores.

All staff shall be made aware of the emergency procedures during their induction training. Emergency drills should be carried out on an annual basis to ensure proficiency of staff and adequacy of procedures. Procedures should be amended and updated based on new information or drill experience, where required.

All permanent staff should undergo basic first aid training. At least one fully trained first aider should be on site during every shift. The first aiders will be responsible for maintaining all emergency equipment, ensuring that all emergency equipment and first aid provisions are routinely inspected and replaced or serviced as required.

A project signboard shall be provided at the entrance to the site which will provide the relevant contact details for key staff of the O&M Contractor and NamWater. A list of key emergency telephone numbers shall be posted near the telephone.

NamWater shall ensure that the O&M Contractor does not utilise the premises for any activity not directly associated with the operation or maintenance of the plant.

3.4 EMPLOYMENT CREATION AND SKILLS DEVELOPMENT

Whilst the operation of the plant will be handled by NamWater, they should stipulate in the contract that the O&M Operator is required to employ local labour for all unskilled and semi-skilled positions and or train local staff to fulfil semi-skilled positions. These positions should take specific measures to ensure adequate gender equality as per the EGP.

The O&M Operator should also be required to undertake a skills development programme, where unskilled and semi-skilled workers are trained to undertake basic plant operations, which could make staff employable in other water and waste treatment facilities at the project at the end of its life cycle. NamWater in association with the O&M Operator should identify required skills sets and develop a skills development programme whilst incorporating gender equality. In the event of a succession in the O&M Contractor, NamWater, through its tendering and contracts process, should institute measures to protect the employment opportunities of local staff associated with such succession.

In addition, the O&M contract should also include targets pertaining to local procurement in accordance with NamWater's procurement policies, which should give preference to local service providers.

3.5 SITE ACCESS AND SECURITY

The desalination pilot plant possesses a health and safety risk to the uninitiated, since much of the equipment is automated, turning on and off without warning and the various potentially harmful chemicals stored on the site. The plant also represents a significant financial investment and an important asset to NamWater. The plant's proximity to local community areas is also such that the public may be enticed to enter the site out of interest. For these reasons it is essential that security and access control measures are implemented throughout the project lifespan.

An access control system shall be developed to ensure that no unauthorised personnel can gain access to pilot plant. A windscreen sticker should be provided to all permanent staff, authorised service providers, and officials needing access from time to time. All other visitors are required to report to the site offices on entering the plant and must be escorted around the facility.

All buildings, when not actively occupied, should be closed and locked. All vehicular and pedestrian gates should also be kept locked at all times. "No Unauthorised Entry" warning signage should be posted at entrances, warning of the potential danger and providing relevant contact numbers of key operational staff in the event that outsiders need entry for whatever reason.

A security presence shall be maintained on the site permanently, including during shutdown or mothballing periods. All security incidents shall be immediately reported to NamWater within 24 hours of occurring. Security personnel should be sourced from a reputable company and random checks should be conducted to ensure that personnel are at their stations and alert.
The O&M Operator shall ensure that the premises are not used for any activity not directly associated with the operation or maintenance of the plant.

3.6 FACILITY MANAGEMENT AND OPERATIONS

NamWater shall ensure that sufficient budget allocations and provisions are made available to ensure that the infrastructure can be adequately operated and maintained. NamWater must also attend to any damages of the Plant resulting in any potential pollution and leakages of the brine, as a matter of high priority.

3.7 ROUTINE MAINTENANCE AND REPAIRS

The condition of the infrastructure shall be inspected routinely and a maintenance list compiled. Identified, preventative maintenance issues shall be undertaken as soon as possible. Any wastes or pollution arising from the repair and maintenance work must be rectified as soon as possible.

3.8 ENVIRONMENTAL & SOCIAL AWARENESS

Instilling a sense of environmental and social awareness and consideration in all employees, but especially those involved with the project is vital to the overall success of any ESMP. It is therefore recommended that a general environmental and social awareness course for all new operational staff and employees of maintenance Contractors, who may be required to carry out duties on the project, be undertaken on their appointment. It is recommended that the regional council / local village council create a “green rules” pamphlet for dissemination to all workers and Contractors working on all council projects and sites.

3.9 WASTE AND POLLUTION MANAGEMENT

3.9.1 Hazardous materials

Where hazardous materials are required for repair and maintenance work (including fuels and oils), care shall be taken to ensure that a competent individual is appointed to enforce the responsible use of such materials. The operational staff or maintenance teams shall carry a copy of the relevant MSDS whenever using such materials. NamWater shall ensure that persons working with hazardous materials have been trained in the handling of such substances, as well as in emergency procedures to be followed in the event of an accidental spillage or medical emergency. Maintenance teams shall also carry a spill kit containing the appropriate neutralizing chemicals, absorbent materials and other relevant equipment required to undertake a clean-up of any spill that may occur.

3.9.2 Noise and Odour management

During maintenance operations, all silencing mechanisms on all equipment must be in a good state of repair. Except for in emergency situations, no amplified sound may be broadcast. All routine maintenance shall be restricted to daylight hours.

I addition all odour control mechanisms must be in good working condition. If any odours is of a nuisance to surrounding areas / neighbours it must be immediately rectified and properly controlled.

3.10 SUMMARY OF OPERATIONAL PHASE / POST-CONSTRUCTION MANAGEMENT ACTIONS

Table 8: Operational Phase Management Table

Aspect	Management Objective	Management actions	Responsibility
Pre-operational	To ensure that proper employment procedures (gender / equity / locals) were carried out. To ensure that the local community were properly consulted before operation starts.	• Appoint qualified management and suitable employees in order to operate and oversee the operations of the Plant on a daily / weekly basis with the carrying out of proper employment procedures (gender / equity / locals) and providing skill transfer where possible. • Educate the local public in the operations of the Plant and the benefits and employment opportunities to be investigated for growth within the local economy.	NIE / NamWater
Reluctance of beneficiaries to use desalinated water	Proper educational awareness needs to take place within the local community.	• Proper educational awareness needs to take place within the local community. • This can be done with schools visiting the Plant / information section at the plant or doing community outreach with the Local Town Councils / other community bodies (churches etc).	NIE / NamWater / MHSS
Responsible management	To ensure that operational activities are carried out sufficiently and adequately.	• Appoint proper qualified management and employees in order to operate and oversee the operations of the Plant on a daily / weekly basis.	NIE / NamWater
Environmental and social awareness	To ensure that all employees, Sub-Contractors as well as the surrounding community are informed of their environmental and social obligations.	• Environmental, Health, and Safety procedures must be properly communicated to the employees (with appropriate safety gear and signage) of the plant as well as local communities in close proximity.	NIE / NamWater
		• The operations manager responsible will provide feedback to his staff on their environmental and social performance and address issues requiring attention and specific actions required.	NIE / NamWater
Safety to the employees and public	To reduce the risks posed by the project to the employees and local public.	• Where the public could be exposed to danger by any of the Plant activities, the Operator shall provide flagmen, barriers, and/or warning signs in English where applicable. • The Operator shall implement appropriate measures to limit any	NIE / NamWater / MHSS

Aspect	Management Objective	Management actions	Responsibility
		adverse social impacts associated with the operations of the plant where applicable.	
Human resource and opportunities management	To ensure that job creation and accommodation of additional workforce within a small community does not result in significant social impacts.	• In order to enhance the benefits of employment creation for these communities, it is recommended that the Operator shall establish a formal and organised recruitment process in line with this EMP.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
	Operational activities shall be restricted to specified hours with proper emergency response teams in place in case of an emergency outside of general office hours.	Operational activities shall be restricted to specified hours with proper emergency response teams in place in case of an emergency outside of general office hours.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
	Local employment and job opportunities. The construction phase of the project will have a positive impact on the local labour market. A positive impact on continued permanent employment will be probable due to the proposed project as the long-term economic viability of the plant will be possible, following the plant expansion. (+)	• Unskilled job opportunities should be afforded to the local communities, as far as possible. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities. • Individuals with the potential to develop their skills should be afforded training opportunities. • Payment should comply with applicable labour legislation in terms of minimum wages. • Where local labourers are employed on a permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation

Aspect	Management Objective	Management actions	Responsibility
		required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' construction phase positions have become redundant or once the construction phase comes to an end.	
	Local economy opportunities and economic empowerment. The operational phase of the project will have positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. • As for maximising employment benefits. Also: • Develop register of local SMMEs. • SMME skills development as part of Corporate Social Investment (CSI) programme. • Community education.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
Risk of skill loss – skilled staff leaving NamWater employ during / after Pilot Phase (Sustainability)	To ensure that no skill loss – skilled staff leaving NamWater employed during / after Pilot Phase takes place.	• Local people can be trained part-time during the construction period to attain skills necessary for operation of the plant. • Details of the proposed project should be designed in consultation with community. • NamWater should support or endorse existing development programmes. • Skills transfer should be encouraged by identifying people with the potential • On-site or in-job training should be encouraged • Promote skills development programmes related to alternative economic activities	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
Leakage of brine into soil and groundwater from ponds (poor design, damage of lining during cleaning, flooding during heavy	To ensure no leakages of brine and wastewater into the environment / groundwater.	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall events. • Competence of operating staff employed at the plant • Develop a proper and up to date Operation and Maintenance (O&M) manual of procedures with technical guidelines • Routine and proper environmental monitoring of all aspects of the plant. • Establish regular reporting procedures on maintenance	NIE / NamWater / MAWF / MHSS

Aspect	Management Objective	Management actions	Responsibility
rain)		• Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged/ deficient equipment, as per the Operation and Maintenance Manual • Brine peak flow monitoring by monitoring the incidence of overflow at pump stations leading to the ponds and accurate recording of flow metering. • Monitoring of surrounding boreholes for potential contamination of surrounding sources or from the brine evaporation ponds.	
Improper reuse of the brine / salt-by-product	The reuse of the brine must be properly researched.	• The use of brine (salt) produced during water treatment for agricultural / other uses is encouraged due to the high levels of nutrients inherently contained therein. • Proper research must be done to make sure that the brine / salt-by-product is used in the correct ways. • In addition, such use must be strictly controlled and monitored with restrictions on specific uses to ensure the health and safety of both the producers and the consumers of the products to which the brine / salt-by-product has been applied (DWAF, 2012). • Different options of reuse of the brine must be properly researched. • Test and continues samples need to be taken in order to make sure no harm comes to people or animals that may come n contact or utilise these options further.	NIE / NamWater / MAWF / MHSS
Water quality changes (+)	The project is aimed at improving the quality of water for NW to comply with the new water quality regulations of the Water Resources Management Act of 2013	• Regularly test water to ensure continuous compliance with water quality regulations	NIE / NamWater / MAWF / MHSS
Non-sustainability of water sources	To ensure the ground water resource is not over abstracted.	• Routine and proper monitoring of all aspects of the plant. • Proper monitoring of water being pumped / being used or wasted.	NIE / NamWater / MAWF / Town

Aspect	Management Objective	Management actions	Responsibility
being over used		• Regular checks on all aspects of water usage be reported	Councils
Sustained future operation, management and maintenance of the plants	To ensure the sustained future operation, management and maintenance of the plant.	• Plan the project in such a way to minimise social costs and maximise the benefits discussed.	NIE / NamWater / MAWF / Town Councils
Possible unaffordable water tariff for desalinated water Collapse of the South African Rand (and the N$)	To ensure the water tariff for desalinated water does not become unaffordable to the local community where NamWater wants to help.	• Provide subsidies to most vulnerable people.	NIE / NamWater / Town Councils
Improved health.	The project will provide the local community with better quality water and this will have a positive impact on the health of the people. (+)	• Regularly test water to ensure continuous compliance with water quality regulations.	NIE / NamWater / MAWF / Town Councils / MHSS
Savings on current expenses.	Due to the better-quality water, medical expenses would be less (dentists) and less frequent need to replace water usage equipment (Geysers, kettles etc.). (+)	• Regularly test water to ensure continuous compliance with water quality regulations.	NIE / NamWater
Self-esteem upliftment.	With cleaner teeth comes higher self-esteem, less likelihood of depression and	• Regularly test water to ensure continuous compliance with water quality regulations. • Provide training in basic hygiene.	NIE / NamWater

Aspect	Management Objective	Management actions	Responsibility
	social betterment regarding relationships and even job performance. (+)	• Provide counselling programmes.	
Training and skills transfer.	The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc. • Identify vulnerable people, youth and women to take part in training and skills transfer programmes.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
Noise	To limit noise levels form the plant and wind turbines	• Adequate controls of heavy vehicle traffic during to mitigate negative impacts such as noise and sense of place.	NIE / NamWater
Health hazard to animals and people entering the pond area	Limit adverse health effects from people or animals utilising the wastewater pond areas.	• The Plant and ponds need to be properly fenced to keep animals from entering the site.	NIE / NamWater / Town Council / MHSS
Collision of birds with wind turbines	Install effective bird deterring techniques where possible.	• Assessment and monitoring be done on the effects of the wind turbines on surrounding wildlife, especially birds.	NIE / NamWater
Potential of birds being attracted to the ponds	Install effective bird deterring techniques where possible.	• Assessment and monitoring be done on the effects of the ponds on surrounding wildlife, especially birds.	NIE / NamWater
Fire or explosion of plant	Ensure that proper fire safety equipment are onsite at designated areas.	• Health and safety protocols to be put into place. A method statement is required for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage. • No persons allowed on site other than project employees. • Minimal materials are stored. • All waste disposal bins will be emptied. • Materials are stored in leak-proof, sealable containers or	NIE / NamWater / Town Council / MME

Aspect	Management Objective	Management actions	Responsibility
		packaging. • The store area is secure and locked. • Basic firefighting equipment must be available on site. Fire extinguishers are serviced and accessible. • The area is secure from accidental damage through vehicle collision, etc. • Emergency and contact numbers of the operator / NamWater / NIE are available and prominently displayed. • All stores will be secured. • Chemical toilets are empty, kept hygienically clean and secured. • 24-hour security will be on site during this period. • All trenches are barricaded with danger tape..	
Used equipment such as RO filter disposal	Ensure that RO filters once reaching its lifespan is properly disposed of.	• Proper disposal plan be provided on how to dispose of plant equipment, be it; to sell the equipment to be reused / recycled by a prospected buyer; or the disposal at a licenced landfill site. • A disposal certificate must be obtained and signed off by a licenced waste disposal specialist.	NIE / NamWater
Theft of solar panels and other materials	Try and ensure proper means to deter the theft of solar panels and other operational materials	• Site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations.	NIE / NamWater / Town Council / Local Police
Visual impact of the plant, solar panels and wind	Visual impact of the plant, solar panels and wind are not significant	• Sensitisation must be done to provide effective mitigation measures where possible	NIE / NamWater
Solid waste management	To ensure that there is no illegal disposal of waste.	• The Operator shall provide sufficient number of rubbish bins with secured lids. • No waste materials, including domestic, organic or operational wastes shall be burnt, dumped or buried on the Site.	NIE / NamWater / Town Council

Aspect	Management Objective	Management actions	Responsibility
Equipment maintenance and storage	All equipment are kept in good working order.	• Leaking or damaged equipment shall be repaired immediately or removed from the Site.	NIE / NamWater
Plant down-time (no water provision)	Minimise and properly handle the down-time (no water provision) of the plant	• Water will be stored in existing / additional reservoirs to have back-up water for a minimum of 48h so that the problem can be fixed within that time frame. • If the problem persists after the 48h, water provision will temporarily switch back to the old water scheme standards.	NIE / NamWater / Town Council
Hazardous substances	Any hazardous substances are stored appropriately.	• Hazardous chemical substances used during operation shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.	NIE / NamWater / MHSS
Emergency procedures	All employees are aware of emergency procedures.	• The Operator shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills. • The Operator shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times.	NIE / NamWater / MHSS

4 DECOMMISSIONING / EQUIPMENT REPLACEMENT

Given the nature and purpose of the infrastructure, it is unlikely that this entire plants infrastructure will be decommissioned in the near future. In order to be sustainable the project would rather deal with continually replacing life-ending equipment than the possibility of decommissioning.

In the unlikely event that the use of the infrastructure is discontinued by NamWater, the infrastructure would be auctioned. Removal of the infrastructure is likely to cause more environmental or social harm than its abandonment.

If, for whatever reason, sections of the Works need to be removed, the materials would either be disposed of at a registered landfill site or it would be recycled depending on the type of material. The best option at the time would be investigated.

5 MONITORING PROGRAM

The monitoring program evaluates the effectiveness of the management and implementation of the mitigation measures associated with the pilot desalination project. The program focus on the mitigation measures mentioned in Table 6&7 and it is also complementary to the mitigation measures under the Construction and Operational Phases. The Monitoring Program as presented in has the following sections:

- Public Awareness and Community Perceptions
- Disruptions of Public Utilities and Services
- Traffic Concerns
- Access to Homes and Public Places
- Air Emissions and Air Quality
- Noise Generation
- Handling and Storage of Construction Materials and Wastes
- Hazardous Materials Use and Storage of fuels and Hazardous Materials
- Worker and Public Safety
- Water Quality
- Construction of Treatment Plants and elevated Storage Tanks
- Generation and disposal of TP sludge/wastes
- Storage of Chemicals

Public awareness and community perceptions
Monitoring under this section seeks to confirm that the public awareness and consultations mitigation measures were implemented or held. The monitoring responsibility lies with the NamWater Program Management Team. The monitoring frequency is generally once at the initial stages of the construction and operation and at the end of construction and operation. This will also continue when the plants are handed over to NamWater at once per year frequency.

Disruptions of utilities services
Monitoring is scheduled to be executed mainly by the Construction Supervision Team utilizing onsite inspections and scheduled audits. The monitoring is continuous on a generally monthly cycle.

Traffic concerns
Monitoring focuses mainly on the development and implementation of the Traffic Management Plan. Monitoring or oversight is provided by the Contractor ECO. Indicators are evidence of the completion or implementation of the various tasks and systems. Monitoring is continuous with daily and weekly inspections and monthly audits.

Access to homes and public places
The Construction Supervision staff is responsible for the monitoring. The indicators are implementations of plans, occurrence of consultations and erections of safety barriers.

Air Emissions and Air Quality
Daily inspections are to confirm the use of PPE, dust suppression methods and related tasks. The monitoring will be conducted by the Contractor ECO with daily inspections.

Noise Generation
Monitoring will be conducted by Contractor ECO with daily inspections and monthly audits. The indicators include use of PPE, maintenance of equipment and machinery and limiting of work hours, as needed.

Handling and Storage of Construction Materials and Wastes
The Contractor ECO will conduct the monitoring with a cycle of daily inspections, and monthly audits. The indicators include approvals for placement of wastes, confirmation of the construction of retaining berms and other structures.

Hazardous Materials Use and Storage of fuels and Hazardous Materials
The indicators to be monitored include the installation of secondary containment, approved H&S and Emergency Response Plans, and record of induction training of construction staff in waste handling. The Monitoring is to be conducted by Contractor ECO on weekly inspections, monthly audits and preconstruction reviews.

Worker and Public Safety
The Contractor ECO will monitor the following, training and induction records, use of PPE, caution signage, erection of barriers and access control, signage and the application of H&S procedures.

Water Quality
The indicators for the improvement in water quality will be the changes in total dissolve solid/conductivity, etc to comply with the new water quality standard. NamWater engineers or scientist who will be stationed on the proposed sites will be conducting daily monitoring of the conductivity, temperature, and pH of the water from the RO plants before and after blending. Monthly water samples for full chemical and bacteriological or microbiological will be collected and submitted or send to the NamWater laboratories for analysis.

Water quantity
The NamWater Engineers/Scientist together with the plant operators will be taking weekly monitoring of the production of the boreholes.

Construction of Treatment Plants
The NamWater Chemical Engineers/Environmental Scientist will review the H&S induction and training records, daily inspection reports and other evidence that the H&S Plan is being followed .on a monthly cycle.

Generation and disposal of TP sludge/wastes
The NamWater Chemical Engineers/Environmental Scientist will monitor this aspect focusing on the following indicators of compliance: Induction of contractor workers/staff and subcontractors on handling of sludge, O&M procedures for sludge handling and Pilot Test/Investigation on the disposal of sludge.

Storage of Chemicals
The NamWater chemical engineers/environmental scientist will conduct a monthly review/inspection of this aspect. The indicator of compliance includes MSDS for all chemicals, functional storage containers and chemical usage and inventory records.

Renewable energy plants construction
The NamWater Electrical Engineers will review the design of the plants to ensure that the plants are confirming to the NamWater standard. This will be done once at the pre-construction phase.

Energy from the renewable plants

The NamWater Engineers/Scientist will monitor the electricity generation from the plants on daily basis during the operational phase. Parameters such as the amount of electricity produced by the solar and wind plants. Environmental parameters disturbing the plants from generating electricity such as changes in wind speed and wind direction and changes in sunlight intensity and occurrence of cloud covers will be recorded on site on daily basis.

Changes in health due to desalinated water

The NamWater Engineers/Scientist will conduct surveys after every six months to determine the changes in health of the people previous affected by bad water quality. A baseline survey will be conducted during the pre-construction phase.

6 PUBLIC CONSULTATION/COMMUNICATION

The goals of the Public Consultation/Communication Program are:

- To provide ongoing information on to the affected community and public on the implementation of the proposed mitigation measures.
- Facilitate open and continuous communication and consultation between the various groups including, NamWater, Contractor, Local Authorities, the Stakeholders, impacted community, and the public.
- Providing timely and appropriate information prior to and during construction to enable informed participation in the NamWater program as it suits their interests.
- To encourage participation in the consultation process groups that do not normally participate but who could potentially be impacted by the project and who can both benefit from participation and contribute to it's the overall success.

There will be formal, scheduled consultations and meetings. In addition specific information will be provided on an ad hoc basis to address significant changes in schedule or other important developments.

Two critical aspects in the implementation of the Public Consultation/Communication Program are:

- A Program Public Relations Coordinator who will be responsible for the coordination of communication and consultation with interested Stakeholders and the general public.
- A Grievance Procedure to allow the Stakeholders a formal mechanism to register complaints, grievance and concerns on the implementation of the NamWater.

Stakeholders

Stakeholder Groups will be established in each project areas. The Stakeholders will be representatives from the various civic groups and organizations, religious and business entities, along with the Local Government Administrations, Police and Traffic Department. The NamWater Management, the Supervision and Construction Contractors will also participate in the group.

A date base of participants and stakeholders will be developed and maintained. The groups will be formally invited to participate in the process, and consultations. The date-base and contact lists shall be distributed to all Stakeholders. Each group will select an organization to formally chair and coordinate the Stakeholder activities.

Consultations

The Consultations are designed to provide information and solicit community input on various aspects of the project. There will be formal consultations to address the programmatic issues and impacts established in the Pilot Desalination ESA. The scheduled consultations are listed in Table 9, scheduled Consultations for project area.

The NamWater scientist together with the public relation department will coordinate the consultations for each project areas.

Table 9: Consultations

Consultation	Purpose	Participants	Lead/Chair	Schedules
Initial	▪ Project Start up: ▪ Project Overview ▪ Project Organization ▪ Project Schedule ▪ Social and Env Impacts	Stakeholder group Contractors Schools leaners NamWater project management team ECO Local authorities representatives	NamWater project management team	10-35 days before Schedule Start of Construction
Cost Recovery	Consultation on: Community "ownership" and stewardship of water system Need for cost recovery and justification of water rates; Include information of NRW program	Stakeholder group, NamWater project management team	NamWater project management team	Within 25 days after Start of Construction
Project Plans & Procedures	Consultation on: Access to Businesses and homes H&S Plan Waste Management Plan Traffic Management	Stakeholder group, NamWater project management team, and construction team	NamWater project management team	Within 55 days after start of the Construction
Addressing Community Concerns	Consultation on Grievance Procedure	Stakeholder group, NamWater project management team, and construction team	NamWater project management team	Within 75 days from start of construction.

Meetings

For this project, there will be scheduled and ad Hoc meetings

Scheduled Meetings

Stakeholder Meetings shall be held monthly at a designated location in each of the project area. The Agenda will include but not limited to the following items:

- Project Status Overview
- Project Schedule Updates
- Mitigation Measures
- Public Consultations and Meetings
- Non-Conformances and Corrective Actions
- Public Concerns

- Other Matters

The Stakeholder Meeting will be coordinated and chaired by the Stakeholder selected by the Stakeholder Group. Notices for Stakeholder Meetings should be received ten working days ahead the meeting; notices may be sent to Stakeholders through the electronic media and announced through newspapers, Local TV news and flyers.

Ad Hoc Meetings

Ad Hoc or unscheduled meetings maybe called to address significant changes in project schedules, community concerns or major environmental issues. Any three members of the Stakeholder Group with at least 3 days' notice may request meetings

Public Awareness Campaigns

The primary goals of the Public Awareness Campaign is to provide information on specific aspects of the Pilot Desalination Project to the general public, leaners and women, to increase public awareness of the program with the aim of promoting community ownership and participation in its implementation.

7 CONCLUSION

In conclusion, it should be noted that this ESMP should be regarded as a living document and changes should be made to the ESMP as required by project evolution while retaining the underlying principles and objectives on which the document is based.

The Environmental and Social Specialists are thus of the opinion that this ESMP would be sufficient for the proposed Pilot Desalination Plant.

APPENDIX A:
Grievance Mechanism

APPENDIX B:
Generic Method Statement Example

INFORMATION ON METHOD STATEMENTS

Method Statements are to be completed by the person undertaking the work (i.e. the Contractor). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed and potentially significant environmental aspects mitigated at the planning stage.

The Method Statement can only be implemented once approved by the ECO.

The Contractor (and, where relevant, any Sub-Contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The ECO will use the Method Statement to audit compliance by the Contractor with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the ECO, denoting that the changed methodology or works are necessary for the successful completion of the works, and are environmentally acceptable. The Contractor will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement.

This Method Statement MUST contain sufficient information and detail to enable the ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works. A method statement should clearly answer to following:

- What does the activity entail;
- Why is the activity required;
- When will it commence and how long;
- Where will the activity be undertaken;
- How will the activity be undertaken
  - What equipment and machinery will be required;
  - What materials (Chemicals) will be used in the process;
- What are the potential environmental, health and safety concerns associated with this activity and what mitigation measures will be employed to manage these risks.

The time taken to provide a thorough, detailed method statement is time well spent. Insufficient detail will result in delays to the works while the method statement is rewritten to ECO's satisfaction. The page overleaf provides a pro forma method statement sheet, which needs to be completed for each activity requiring a method statement in terms of the LEMP.

EXAMPLE OF METHOD STATEMENT

CONTRACT: ……..……... DATE: ……..

PROPOSED ACTIVITY (give title of Method Statement and reference number):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:	**End Date:**

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible): Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

_____ _____

_____ _____

(Signed) ***(Print name)***

_____ _____

(Signed) ***(Print name)***

Date: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement:

_____ _____

_____ _____

(Signed) ***(Print name)***

Date: _____

3) ENGINEER

The works described in this Method Statement are approved:

_____ _____

_____ _____

(Signed) ***(Print name)***

Date: _____

4) APPROVING AUTHORITY

The works described in this Method Statement are approved:

_____ _____

_____ _____

(Signed) ***(Print name)***

Date: _____

Annexure 7: Environmental and social management plan: Grünau

PILOTING THE USE OF DESALINATION PLANTS THAT UTILISE MEMBRANE TECHNOLOGY AND ARE SUSTAINABLY POWERED BY RENEWABLE ENERGY TO INCREASE THE RESILIENCE OF VULNERABLE RURAL COMMUNITIES TO CLIMATE CHANGE

GRUNAU, //KARAS REGION
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

June 2017

Submitted by:

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PROJECT DETAILS

TITLE:	Environmental and Social Management Plan for a Proposed Pilot Desalination Plant, Utilising Renewable Power and Membrane Technology at Grunau, //Karas Region
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Abbreviations

AF	Adaptation Fund
AFB	Adaptation Fund Board
DRFN	Desert Research Foundation Namibia
DWAF	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EE	Executing Entity
EMA	Environmental Management Act (No. 7 of 2007)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EO	Environmental Officer
ESP	Environmental and Social Policy
ESMP	Environmental and Social Management Plan
I&APs	Interested and Affected Parties
MAWF	Ministry Of Agriculture Water And Forestry
MET: DEA	Ministry of Environment and Tourism: Department of Environmental Affairs
MSDS	Material Safety Data Sheets
NIE	National Implementing Entity
OEMP	Operational Environmental Management Plan
O&M	Operation and Maintenance

PPE	Personal Protective Equipment
TB	Tuberculosis
STD	Sexually Transmitted Diseases
IFC	International Finance Corporation

1 INTRODUCTION

1.1 PROJECT BACKGROUND

This proposed project aims to test a method for improving the assured supply of good quality groundwater to small towns and villages in Namibia. It will further improve the resilience of such communities against the increased variability in rainfall that is expected with climate change.

As an arid country, Namibia depends heavily on its groundwater resources. This brings two challenges: high rainfall variability makes recharge into aquifers also variable, so groundwater reserves in many places are not reliable. Secondly, groundwater quality is poor in many places, below the thresholds for certain chemicals (e.g. fluoride, total dissolved solids and salinity) for safe human consumption. This requires water treatment techniques, such as filtration or desalination. These in turn demand energy in the form of electricity.

As such the Namibia Water Corporation Ltd (NamWater) as an executing entity in collaboration with the Desert Research Foundation of Namibia (DRFN) as an implementing entity, applied for a Project Formulation Grant (PFG) at the Adaptation Fund (AF). The grant was awarded for the formulation of a full project proposal on the Desalination of poor water quality of selected treatment plants using Renewable Power and Membrane Technology.

1.1.1 Setting the Scene

Water is life. For millions of years' life on earth has been dependent on water for survival. The amount of water on earth is constant and cannot be increased or decreased, but it is unevenly distributed across the earth.[1] According to the IPPR, Namibia is facing a creeping yet increasingly precarious situation of freshwater scarcity, and the UNDP states that Namibia is the driest country in sub- Saharan Africa receives a pitiful 270 millimetres of downpour per year on average. Of this 83 percent evaporates as soon as it hits the ground.

Climatologists predict temperatures in the country will rise with 1 to 6 degree in the next several decades, while rainfall could drop another 200 millimetres. Already, in the past few years, rains have been erratic leading to alternating heavy floods and dry spells. The consequences are devastating for a country where 70 percent of the people to some extent depend on agriculture.

Three sample villages were initially selected for this pilot project, i.e. Bethanie, **Grünau** and Epukiro Post 3. Grünau is situated in the far south of the country, in the //Karas Region and in the in the Karasburg Constituency approximately 165 km south of Keetmanshoop and approximately 50km north-west of Karasburg – refer to *Figure 1* below.

[1] http://www.waterwise.co.za/site/water/environment/situation.html

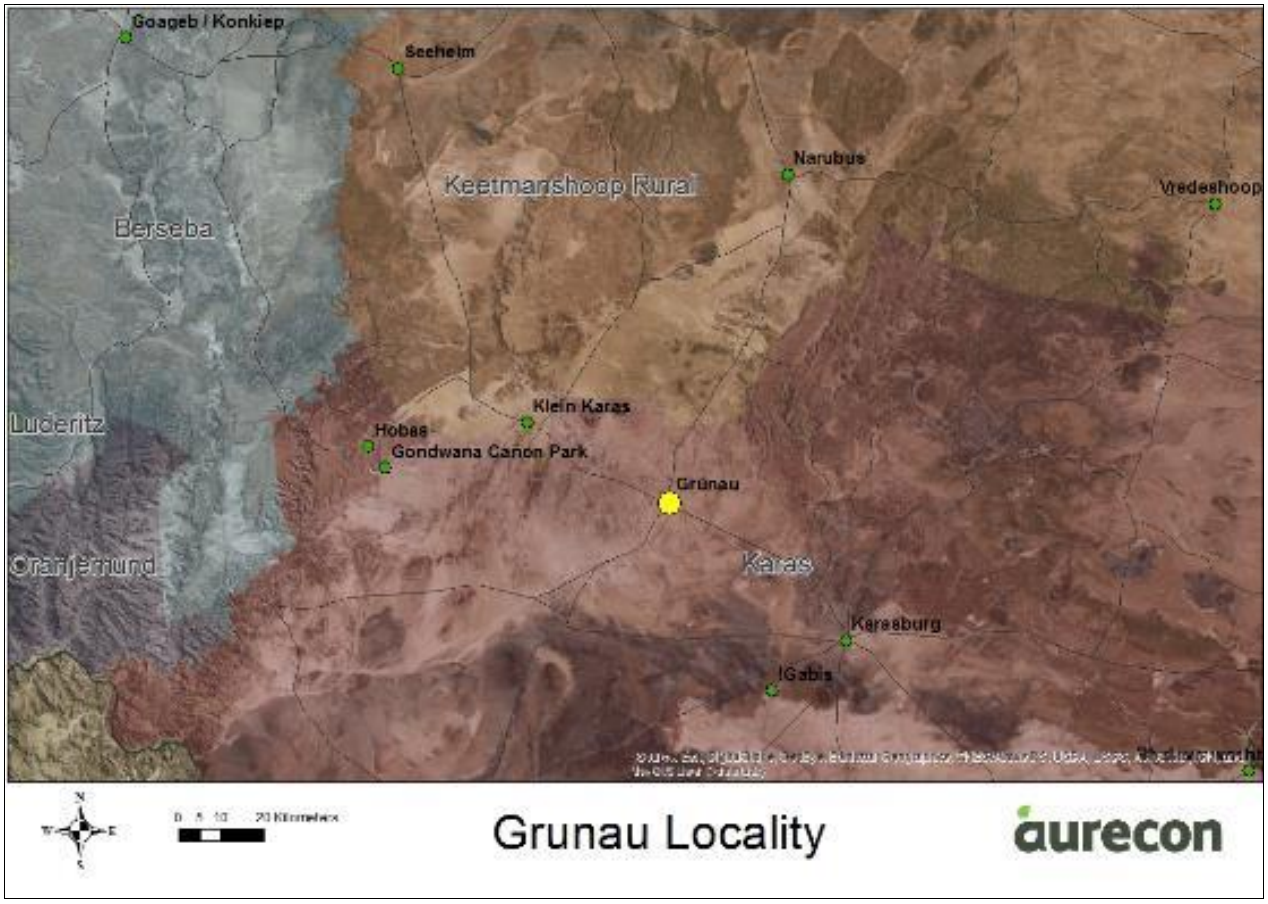

Figure 1: The project locality map

The main objective of this project is to test the effectiveness of a system that will combine renewable energy with the needs of the water sector to improve resilience against climate change. The project will refine small-scale solar- and or wind-driven desalination plants to improve the quality of selected groundwater sources for human consumption, and will attempt to reduce the cost of water to communities served by these schemes.

If successful, this project will demonstrate a useful method that can be rolled out to meet similar needs in off-grid communities in Namibia and elsewhere to improve the water situation for remote villages and settlements in the face of climate change.

1.1.2 Project summary

The proposed project for the pilot desalination will involve three main objectives, which are:

- *Objective 1: Acquire knowledge and skills on how to effectively and efficiently desalinate poor quality groundwater on a small scale using RO technology and hybrid renewable energy technology that can be applied to improve the resilience of rural communities against climate change.*
- *Objective 2: Positively impact the lives of vulnerable individuals and communities at the two project sites by supplying them with water that complies with the Namibia water quality standards for drinking water, raising their awareness of climate change and the effects on water supply, and creating an understanding by them of why water tariffs are imposed.*
- *Objective 3: Communicate the acquired knowledge and skills to stakeholders in the water supply sector and thereby promote the mainstreaming of such small-scale desalination technology and systems in the country*

To ensure effective implementation of each objectives, seven (7) components were developed. For each components there various activities which will be implemented. The following are the proposed components for the pilot desalination project:

- *Component 1: Development of pilot desalination plants at Bethanie and Grünau*
- *Component 2: Development of pilot hybrid renewable energy plants at Bethanie and Grünau*
- *Component 3: Testing and commissioning of plants at Bethanie and Grünau, and training of staff*
- *Component 4: Piloting of the plants at Bethanie and Grünau*
- *Component 5: Supply good quality water to the communities at the two project sites during piloting of the plants*
- *Component 6: Sensitise beneficiaries and local stakeholders*
- *Component 7: Information and knowledge dissemination to regional and national stakeholders*

1.1.3 Why Grünau Village

The current population in Grünau is estimated at 1,000 persons. The Grünau community's raw water is abstracted mainly from six available boreholes. The six boreholes pump to two ground level reservoirs, four of the borehole abstraction pumps are diesel driven and the other two are solar-powered with panels. The production boreholes are connected via 90mm, 63 mm and a 160-mm uPVC pipelines to the 100 m^3 reservoirs. The two reservoir is connected with a 90mm uPVC pipeline over distance of 6.5 km. From the mechanical bulk water meters the water gravitates into a 100m^3 galvanized steel panel tank on a 12m high tower.

Water abstracted from four of those boreholes have currently high *fluoride* contents, more than 2 mg/l, corresponding to class B and class C water. While water from the other two boreholes have fluoride content lower than 2 mg/l.

The current water situation in Grünau is extremely strained. The actual demand is estimated in 34 m^3/day and is expected to increase to 60 m^3/day in peak months by 2030. The water source is stressed as the combined yield of the current six boreholes is not enough to cope with the demand. Water is available for only about 1.5 hours of the day and if no member of the household is home or in the area at the time, then the household does not have any water available for that day.

Figure 2: Grunau Community

Future development of the scheme consists of the installation and connection of three additional boreholes, that will allow to meet the actual demand. The Grünau Village Council has also indicated that they received a borehole from TransNamib, which delivers a high quantity of water continuously throughout the year. Numbers could not be provided at this stage, but are available on request. This water however are of extremely poor quality and are not suitable for human consumption. NamWater has indicated that they will look into this borehole's productivity and quality and whether it might be suitable to be included into the scheme and the proposed desalination plant to be piloted.

Currently the formal part of the Grünau settlement has taps in their yards and the informal part of the settlement has communal standpipes. The main water tank is a couple of 100 metres from the settlement. Future development of the scheme consisting on the installation and connection of four additional boreholes that will allow to meet the actual demand.

It was stated by a farmer, the groundwater is very deep as far as 300 m and the source is very week and in the past 5 years the availability of water has almost depleted.

In addition, other parameters also exceeding the concentration limits given in the guidelines include calcium, magnesium, sodium, chlorides, fluoride, nitrates, sulphates, conductivity, total dissolved salts and turbidity as displayed in Table 1 below.

Table 1: Groundwater Quality of Grünau

Parameters	Treated Water Requirement (Ideal - 95% - mg/l)	Grunau Raw water (Borehole - mg/l)
Cations		
Calcium	<200	393
Magnesium	<125	207
Potassium	<25	4.5
Sodium	<100	154
Anions		
Alkalinity, as HCO3		359
Chloride	<100	200
Fluoride	<0.7	2.26
Nitrate	<6	26
Sulphate	<100	145
Other		
Conductivity	<80	177
TDS	<500	1186
pH	6.0 – 8.5	8.2
Total hardness	<200	600
NTU	<0.5	0.85
TOC**		
SiO_2		33
Colour	10	3.2

** TOC to be analysed for

Fluoride can be beneficial in helping to prevent dental caries at drinking water concentrations of about 1 mg/L, but it also causes dental mottling and adverse effects on bones, including an increased risk of fracture and in extreme cases skeletal fluorosis at concentrations more than 1.5 mg/L.

A 15 m^3/h reverse osmosis package plant with a Microfiltration or ion exchange (softening) pre-treatment is proposed to improve the water quality of this scheme. The additional three boreholes will require construction of new pipelines to connect to the existing storage reservoirs and treatment plant. It has been suggested that water only for human consumption needs to be

treated. This would reduce the cost of the treatment facilities. Small plants could be provided at strategic positions to supply drinking water for collection by residents.

The Desalination Plant will thus clean the water to the appropriate quality standards. A small-scale hybrid solar- and or wind-driven electricity generation will be implemented to power the plant.

1.1.4 Desalination Technologies

a) Multi-Stage Flash Distillation (MSF)

In MSF, seawater feed is pressurized and heated to the plant's maximum allowable temperature. When the heated liquid is discharged into a chamber maintained at slightly below the saturation vapour pressure of the water, a fraction of its water content flashes into steam (Karaghouli et al. 2009; 2398). The flashed steam is stripped of suspended brine droplets as it passes through a mist eliminator and condenses on the exterior surface of the heat-transfer tubing. The condensed liquid drips into trays as hot fresh-water product (Karaghouli et al. 2009; 2398).

b) Multi-Effect Distillation (MED)

MED units operate on the principle of reducing the ambient pressure at each successive stage, allowing the feed water to undergo multiple boiling without having to supply additional heat after the first stage. In this unit, steam and/or vapour from a boiler or some other available heat source is fed into a series of tubes, where it condenses and heats the surface of the tubes and acts as a heat-transfer surface to evaporate saline water on the other side (Karaghouli et al. 2009; 2398).

The energy used for evaporation of the saline water is the heat of condensation of the steam in the tube. The evaporated saline water—now free of a percentage of its salinity and slightly cooler—is fed into the next, lower-pressure stage where it condenses to fresh-water product, while giving up its heat to evaporate a portion of the remaining seawater feed (Karaghouli et al. 2009; 2398).

c) Vapour-Compression Distillation (VC)

The VC distillation process is generally used for small and medium-scale seawater desalting units. The heat for evaporating the water comes from the compression of vapour, rather than from the direct exchange of heat from steam produced in a boiler (Karaghouli et al. 2009; 2399). The plants that use this process are generally designed to take advantage of the principle of reducing the boiling-point temperature by reducing the pressure. Two primary methods are used to condense vapour so as to produce enough heat to evaporate incoming seawater: a mechanical compressor or a steam jet. The mechanical compressor (MVC) is usually electrically driven, allowing the sole use of electrical power to produce water by distillation (Karaghouli et al. 2009; 2399).

With the steam jet-type of VC unit, also called a thermo compressor (TVC), a Venturi orifice at the steam jet creates and extracts water vapour from the main vessel by creating a lower ambient pressure in the main vessel. The extracted water vapour is compressed by the steam jet. This mixture is condensed on the tube walls to provide the thermal energy (heat of condensation) to evaporate the seawater being applied on the other side of the tube walls in the vessel (Karaghouli et al. 2009; 2399).

VC units are usually built in the range of 20–2000cum/d (0.005–0.5 mgd), and they are often used for resorts, industries, or other sites where fresh water is not readily available.

1.1.5 Membrane Processes

a) Reverse Osmosis (RO)

In reverse osmosis (RO), water in a pressurized saline solution is separated from the solutes by a membrane. No heating or phase change is necessary for this separation, and the major energy requirement is for pressurizing the feed water. In practice, the saline feed water is pumped into a closed vessel, where it is pressurized against the membrane. As a portion of the water passes through the membrane, the salt content of the remaining feed water increases because there is less water containing the same total amount of dissolved salts. At the same time, a portion of this saltier feed water is discharged without passing through the membrane.

Figure 3: Containerized reverse osmosis desalination system

RO units have a waste discharge of brackish water or brine that can range from 35% to 100% of its output of fresh water, depending on the feed water being treated. During the past decade, two improvements have helped reduce the operating costs of RO plants - the developments of membranes that can operate efficiently at lower pressures, and the use of energy recovery devices. Low-pressure membranes are being widely used to desalinate brackish water because they save on the energy costs associated with pumping.

b) Electrodialysis (ED)

The basic electrodialysis (ED) unit consists of several hundred cell pairs bound together with electrodes on the outside and referred to as a membrane stack. Feed water passes simultaneously through the cells to provide a continuous, parallel flow of desalted product water and brine that emerge from the stack. The ED process is only economical when used on brackish water, and it tends to be most economical at Total Dissolved Solids (TDS) levels of up to 4000–5000 mg/L.

In the early 1970s, an American company commercially introduced the EDR process for electrodialysis. An EDR unit operates on the same general principle as a standard electro- dialysis plant except that both the product and the brine channels are identical in construction. At intervals of several times an hour, the polarity of the electrodes is reversed, and the flows are simultaneously switched so that the brine channel becomes the product-water channel, and the product-water channel becomes the brine channel. The result is that the ions are attracted in the opposite direction across the membrane stack. Immediately following the reversal of polarity and flow, enough of the product water is dumped until the stack and lines are flushed out, and the desired water quality is restored. This flush takes about 1 or 2 min, and the unit can then resume

producing water. The reversal process is useful in breaking up and flushing out scales, slimes, and other deposits in the cells before they can build up and create a problem. Flushing allows the unit to operate with fewer pretreatment chemicals and minimizes membrane fouling.

1.1.6 Pro's and Con's of the Different Technologies

There are pros and cons of membrane technologies compared to thermal technologies. Some of the advantages and disadvantages of membrane processes vs thermal processes include:

Table 2: Pro's and con's of different desalination processes

Process	Recovery and Total dissolved solids	Pro's (+)	Con's (-)
RO **Preferred option overall**	30-60% recovery possible for single pass (higher recoveries are possible for multiple pass or waters with lower salinity) < 500 mg/L TDS for seawater possible and < less 200 mg/L TDS for brackish water	• Lower energy consumption • Relatively lower investment cost • No cooling water flow • Simple operation and fast start-up • High space/production capacity • Removal of contaminants other than salts achieved • Modular design • Maintenance does not require entire plant to shutdown	• Higher costs for chemical and membrane replacement • Vulnerable to feed water quality changes • Adequate pre-treatment a necessity • Membranes susceptible to biofouling • Mechanical failures due to high pressure operation possible • Appropriately trained and qualified personnel recommended • Minimum membrane life expectancy around five to seven years
ED/EDR	85-94% recovery possible 140 - 600 mg/L TDS	• Energy usage proportional to salts removed not volume treated • Higher membrane life of 7-10 years • Operational at low to moderate pressures	• Only suitable for feed water up to 12,000 mg/L TDS • Periodic cleaning of membranes required • Leaks may occur in membrane stacks • Bacterial contaminants not removed by system and post treatment required for potable water use

MSF	25-50% recovery in high temperature recyclable MSF plant < 50 mg/L TDS	• Lends itself to large capacity designs • Proven, reliable technology with long operating life • Flashing rather than boiling reduces incidence of scaling • Minimal pre-treatment of feed water required • High quality product water • Plant process and cost independent of salinity level • Heat energy can be	• Large capital investment required • Energy intensive process • Larger footprint required (land and material) • Corrosion problems if materials of lesser quality used • Slow start-up rates • Maintenance requires entire plant to shut-down • High level of technical knowledge required Recovery ratio low.
MED	0-65% recovery possible < 10 mg/L TDS	• Large economies of scale • Minimal pre-treatment of feed water required • Very reliable process with minimal requirements for operational staff • Tolerates normal levels of suspended and biological matter • Heat energy can be sourced by combining with power generation • Very high quality product water	• High energy consumption • High capital and operational cost • High quality materials required as process is susceptible to corrosion • Product water requires cooling and blending prior to being used for potable water needs.
VCD	~ 50% recovery possible < 10 mg/L TDS	• Developed process with low consumption of chemicals • Economic with high salinity (> 50,000 mg/L) • Smaller economies of scale (up to 10,000 m^3/d) • Relatively low energy demand • Lower temperature requirements reduce potential of scale and corrosion • Lower capital and operating costs • Portable designs allow flexibility	• Start-up require auxiliary heating source to generate vapour • Limited to smaller sized plants • Compressor needs higher levels of maintenance.

(Source: Eltawil et al, 2008; 25 and 26)

Generally, distillation and RO are used for seawater desalting, whereas RO and electrodialysis are used to desalt brackish water. Therefore, the RO technique was chosen as the more preffered option for this study. However, the selection of a process should depend on a careful study of site conditions and the application at hand. Local circumstances may still play a significant role in determining the most appropriate process for an area.

1.1.7 Renewable Technology

The following renewable energy options has been investigated for the proposed pilot studies.

Figure 4: Membrane Distillation installed by SOLARSPRING GMBH

Table 3: Evaluation of renewable energy technologies

Criterion	Solar thermal energy (preferred)	Photovoltaic	Wind energy (preferred)	Geothermal energy
Suitability for powering desalination plants	Well suited for desalination plants requiring thermal power (3)	Well suited for desalination plants requiring electrical power (3)	Well suited for desalination plants requiring electrical power (3)	Well suited for desalination plants requiring thermal power (3)
Site requirements and resources availability	Typically good match with need for desalination (3)	Typically good match with need for desalination (3)	Resources is location-dependent (2)	Resources is limited to certain location (1)
Continuity of power output	Output is intermittent (energy storage required) (1)	Output is intermittent (energy storage required) (1)	Output is intermittent (energy storage required) (1)	Continuous power output (3)
Predictability of power output	Output is relatively unpredictable (2)	Output is relatively unpredictable (2)	Output is very unpredictable/ fluctuates (1)	Output is predictable (3)
Note: 3 = excellent compliance with criterion; 2 = good compliance with criterion; 1 = poor compliance with criterion.				

(Source: Eltawil et al, 2008; 8)

The most mature technologies of renewable energy application in desalination are wind and/or PV-driven membrane processes or a combination of the two and direct and indirect solar distillation. Nevertheless, the coupling of renewable energy and desalination systems has to be optimized (Al-Karaghouli et al. 2009).

1.1.8 Legal framework

Much of the legislation outlined below has applicability from a biophysical, social and visual perspective. While certain relevance is highlighted, such documents are applicable on a variety of different levels.

The Constitution of the Republic of Namibia (1990)

There are two clauses contained in the Namibian Constitution that are of particular relevance to sound environmental management practice, viz. articles 91(c) and 95(l). In summary, these refer to:

- Guarding against over-utilisation of biological natural resources;
- Limiting over-exploitation of non-renewable resources;
- Ensuring ecosystem functionality;
- Protecting Namibia's sense of place and character;
- Maintaining biological diversity; and
- Pursuing sustainable natural resource use.

The above therefore commits the State to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the abovementioned sustainable development objectives.

Namibia's Environmental Management Act (EMA) (Act No 7 of 2007)

In giving effect to articles 91(c) and 95(l) of the Constitution of Namibia, general principles for sound management of the environment and natural resources in an integrated manner have been formulated. This resulted in Namibia's Environmental Assessment Policy of 1994. To give statutory effect to this Policy, the Environmental Management Act was approved in 2007, and gazetted on 27 December 2007 as the Environmental Management Act (Act No. 7 of 2007) (EMA), Government Gazette No. 3966. Part 1 of the Environmental Management Act describes the various rights and obligations that pertain to citizens and the Government alike, including an environment that does not pose threats to human health, proper protection of the environment, broadened locus standi on the part of individuals and communities, and reasonable access to information regarding the state of the environment. Part 2 of the Act sets out 13 principles of environmental management, as follows:

- Renewable resources shall be utilised on a sustainable basis for the benefit of current and future generations of Namibians.
- Community involvement in natural resource management and sharing in the resulting benefits shall be promoted and facilitated.
- Public participation in decisions affecting the environment shall be promoted.
- Fair and equitable access to natural resources shall be promoted.
- Equitable access to sufficient water of acceptable quality and adequate sanitation shall be promoted and the water needs of ecological systems shall be fulfilled to ensure the sustainability of such systems.
- The precautionary principle and the strategy of preventative action shall be applied.

- There shall be prior environmental assessment of projects and proposals which may significantly affect the environment or use of natural resources.
- Sustainable development shall be promoted in land-use planning.
- Namibia's movable and immovable cultural and natural heritage, including its biodiversity, shall be protected and respected for the benefit of current and future generations.
- Generators of waste and polluting substances shall adopt the best practicable environmental option to reduce such generation at source.
- The polluter pays principle shall be applied.
- Reduction, reuse and recycling of waste shall be promoted.
- There shall be no importation of waste into Namibia.
- Promotion of the coordinated and integrated management of the environment;
- The Minister of Environment and Tourism was enabled to give effect to Namibia's obligations under international environmental conventions;
- Certain institutions were established to provide for a Sustainable Development Commission and Environmental Commissioner"[2].

Environmental Guidelines

The EMA, under section 5, states that if a proposal is likely to affect people, the following guidelines should be considered in Scoping / EA:

- The location of the development in relation to interested and affected parties (I&APS), communities or individuals;
- The number of people likely to be involved;
- The reliance of such people on the resources likely to be affected, the resources, time and expertise available for scoping;
- The level of education and literacy of parties to be consulted;
- The socio-economic status of affected communities;
- The level of organisation of affected communities;
- The degree of homogeneity of the public involved;
- History of any previous conflict or lack of consultation;
- Social, cultural or traditional norms within the community; and
- The preferred language used within the community.

The MET also released a Draft Procedures and Guidelines for conducting EIAs and compiling EMPs in April 2008. These guidelines outline the procedures and principles that are to be followed and is also applied here to ensure an effective process and an EMP that addresses all identified impacts.

Namibia Vision 2030

The principles that underpin Vision 2030[3], a policy framework for Namibia's long-term national development, comprise the following:

[2] *Environmental Management Act, 2007 (Act No. 7 of 2007), of the Parliament. Namibia Government Gazette No. 3966*

- Good governance;
- Partnership;
- Capacity enhancement;
- Comparative advantage;
- Sustainable development;
- Economic growth;
- National sovereignty and human integrity;
- Environment; and
- Peace and security.

Vision 2030 states that natural environments are disappearing quickly. Consequently the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets. Vision 2030 emphasises the importance of promoting Healthy Living which includes that the majority of Namibians are provided with basic services. The importance of developing Wealth, Livelihood and the Economy is also emphasised by Vision 2030.

This Project therefore supports the goals to be achieved in Vision 2030, because the desalination plant will allow for better treated quality water.

National Policy on Climate Change for Namibia (2011)

The National Policy on Climate Change pursues constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation."

The policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia's national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Similarly, the policy takes cognizance of Namibia comparative advantages with regard to the abundant potential for renewable energy exploitation, of which this project has taken specifically into account.

The overall goal of the National Policy on Climate Change is to contribute to the attainment of sustainable development in line with Namibia's Vision 2030 through strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.

The project therefore addresses some of the above as it will increase water quality and security, as well as provide a medium-long-term integrated water supply plant that would ensure sustainable utilisation of the available resources as well as the incorporation of renewable energy sources.

National Climate Change Strategy & Action Plan 2013 – 2020

[3] Derived from Namibia's Green Plan drafted by MET in 1992 and followed by the sequence of National Development Plans.

Climate change impacts directly on the entire chain of national development, and is likely to have negative impacts on efforts to achieve development objectives, including the long-term objectives and targets of Namibia's Vision 2030. Climate change is a complex and cross-cutting concern, thus there is a need for a holistic and integrated approach to developing a multi-sectoral (cross-practicebased) National Climate Change Strategy and Action Plan (NCCSAP) in order to implement the National Policy on Climate Change (NPCC), which was promulgated in Namibia in 2011.

The NCCSAP has been developed as a result of the growing concern and discourse focusing on climate variability, and climate change risks and impacts affecting Namibia's social, environmental and economic developmental potential. The Strategy and Action Plan is a key instrument to operationalise the NPCC over a period of 8 years from 2013 – 2020 as a first comprehensive and practical tool which offers guidance on the mechanisms, means and manner in which implementation can happen.

It is clear that climate change awareness, knowledge and understanding, both in terms of the risks, impacts and responses is rapidly developing, and therefore a mid-term review process of the implementation and impact of the NCCSAP is foreseen.

Water Resources Management Act (Act no. 11 of 2013)

This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Relevant principles of the Act include, inter alia:

- Equitable access for all people to safe drinking water is an essential basic human right to support a healthy productive life;
- Harmonisation of human water needs with the requirements of environmental ecosystems and the species that depend on them, while recognising that the water resource quality for those ecosystems must be maintained;
- Promotion of the sustainable development of water resources based on an integrated water resources management plan which incorporates social, technical, economic, and environmental issues;
- Development of the most cost effective solutions, including conservation measures, to infrastructure for the provision of water; and
- Promotion of water awareness and the participation of persons having interest in the decision-making process should form an integral part of any water resource development initiative.

The Department of Water Affairs (DWA) in the Ministry of Agriculture, Water and Forestry (MAWF), is the legal custodian of the wastewater treatment and disposal standards in the country. In accordance with Sections 68 to 75 of the Water Act No 11 of 2013, details of any treatment facility must be submitted to the DWA for the issuing of a wastewater / brine discharge licence. It is therefore necessary that any facility provided meet these requirements.

The purpose of the proposed project is mainly to allow for better quality drinking water and more sustainable adaptable climate change processes. As indicated a wastewater/brine discharge licence is required before the wastewater/brine can be discharged in any way.

This Act will partially be replaced by the Water Act (Act No. 54 of 1956) once it is implemented by government.

Water Act (Act 54 of 1956)

This Act partially replaced by the Water Resource Management Act, consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes. The main purpose of the Water Act is to provide for the sustainable development and use of water resources, and restricts the pollution of waters by means of any activity.
This Act requires the proposed development to investigate and implement measures to ensure sustainable use of water resources and ensure that no pollution of any above or below ground water takes place.

Water & Sanitation Policies

The existing water and sanitation policies in place are the National Water Policy (NWP) adopted in 2000 the Water Supply and Sanitation Sector Policy (WSASP) which was adopted in 2008 and the National Sanitation Strategy of 2009, which is based on this WSASP policy.
In terms of the Act and the **Water Supply and Sanitation Policy**, the developer / client will:

- Take steps to prevent "any public or private water on or under that land, including rainwater that falls on or flows over or penetrates such land" from being polluted.
- Require a permit for the disposal of effluent/brine and or industrial wastewater.

Of particular concern is the prevention of surface- and groundwater pollution, therefore the collection, storage, disposal and potential re-use of sewage-/brine and storm water is of utmost importance.

In terms of the **National Sanitation Strategy 2010/11 – 2014/15**, the developer/contractor must put in place strategies:

- Guaranteeing safe and affordable sanitation, encouraging decentralised sanitation systems where appropriate.
- That should promote recycling through safe and hygienic recovery and use of nutrients, organics, trace elements, water and energy, and the safe disposal of all human and other wastes, including sewage and industrial effluent, in an environmentally sustainable fashion.

Code of Practice: Volume 2 – Pond Systems (2008)
In the Water Resources Management Act, 2013 (Act No. 11 of 2013), there are conditions laid down to ensure that proper wastewater treatment is provided and to facilitate good operation of different wastewater treatment systems and their methods of disposal. The act's main objectives

are to use and protect one of our most valuable natural resources, namely water, and to encourage reuse of the treated wastewater where possible.

Biological treatment processes, which include activated sludge processes, trickling filters (biofilters), oxidation ponds and even the self-purification powers of rivers, all operate on essentially the same fundamental biochemical principles. They differ from one another primarily in the method of adding and utilising dissolved oxygen.

In this manual, pond systems as a biological treatment process are addressed. There are many different pond systems in use throughout the world, with the most common names being anaerobic/aerobic-, stabilisation-, oxidation-, facultative, algae-, evaporation- and maturation ponds.

Code of Practice: Volume 6 – Wastewater Reuse (2012)

Namibia is an arid country and the Water Resources Management Act 2013 (Act No. 11 of 2013)) therefore also encourages the reuse of suitably treated wastewater. Treated wastewater can and should be reused where possible in order to protect valuable natural water resources and this guideline addresses the use of greywater and treated domestic and industrial effluents / waste water for reuse in industrial, agricultural and aquacultural applications. However, it is important to realize that there is a certain risk to the general public coupled to wastewater reuse and carelessness can lead to widespread public health hazards, water borne diseases and can even result in epidemics and fatalities.

When dealing with recovered wastewater emphasis must be placed on continuous monitoring and safe use thereof, especially where treated wastewater ultimately comes into direct contact with humans, or plants and animals consumed by humans, in order to guarantee public health and safety at all times. Wastewater irrigation, for example, can present a risk to public health if not carefully controlled and applied as stipulated in this guideline. However, wastewater reuse can be beneficial because it can prevent over-exploitation of natural water resources. Also, wastewater contains valuable nutrients and no fertiliser needs to be added when reusing treated, domestic effluent for agricultural purposes. Thus the advantages and disadvantages of wastewater reuse must be carefully weighed up when determining areas of application for such reuse.

In this manual, the treatment and reuse of wastewater are discussed. Water Quality Standards for Effluent are also listed in Appendix A of the manual.

Guideline for disposal of solids from water and wastewater treatment processes (2012)

This guideline addresses the use and disposal of solids generated during the treatment process by both drinking water and wastewater treatment plants. Due to the costs associated with landfill disposal options, environmental concerns and globally increasing awareness about waste reduction and recycling, the purpose of this guideline is to inform plant owners how to safely discard their solid waste and to promote the safe and feasible reuse of such waste.

When dealing with recovered wastewater sludge emphasis must be placed on the continuous monitoring and safe use thereof, especially where such sludge comes into direct contact with

humans, or plants and animals consumed by humans. Possible risks and hazards related to sludge use include:

- water-borne diseases caused by helminth, bacterial, viral and/or protozoan infections.
- aesthetic issues like odor pollution or decreased product sales due to consumers not wanting to buy products that were produced using wastewater.
- environmental issues including groundwater contamination, endangering of marine life and pollution of water bodies used for recreational purposes.

The disposal of sludge for agricultural purposes and other methods are discussed in this guideline. Various restrictions and other monitoring measurements are also explained.

Namibia Agricultural Policy (2015)

The Namibia Agriculture Policy is aimed at contributing to increased agricultural production, agro-processing and marketing as well as to serve as an overarching policy in the agricultural sector. The document is divided into two major parts.

Part A articulates the policy and strategies for the agriculture sector. The theme areas cover production, agro-industry development, marketing and trade, research and development, international cooperation, training and capacity building, management information systems, agro-financing, co-operative development and extension services.

Part B of the Policy outlines mainly the role of stakeholders, policy implementation and revision as well as monitoring and evaluation mechanisms.

Forestry Act (Act 12 of 2001), As Amended

The Act deals with forests in general and matters incidental thereto. Of importance to the proposed development is that the Act affords general protection of the environment (Part IV). Section 22 affords protection to natural vegetation stipulating that no living tree, bush or shrub within 100 m from any river, stream or watercourse may be removed without the necessary license. Permits are required for the removal of trees, bushes or shrubs, or any indigenous plants.

Soil Conservation Act (Act 76 of 1969), As Amended

Partially similar to the other acts and ordinances above, this Act addresses the issues of vegetation and ground water, but also includes the matter of soil. In specific the Act focuses on combating and preventing soil erosion; the conservation, protection and improvement of soil and vegetation and water sources and resources.

Pollution Control and Waste Management Bill (in preparation)

This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force.

In terms of water pollution, it will be illegal to discharge of, or dispose of, pollutants into any watercourse without a Water Pollution Licence (apart from certain accepted discharges). Similarly an Air Quality Licence will be required for any pollution discharged to air above a certain threshold.

The Bill also provides for noise, dust or odour control that may be considered a nuisance. The Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.

Atmospheric Pollution Prevention Ordinance (No.11 of 1976), As Amended

The Atmospheric Pollution Prevention Ordinance (APPO) (No. 11 of 1976) addresses the following:

- Part II: Controls of noxious or offensive gases;
- Part III:Atmospheric pollution by smoke;
- Part IV: Dust control; and
- Part V: Air pollution by fumes emitted by vehicles.

This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. Any person carrying out a 'scheduled process' which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health. The Ordinance is clear in requiring that –

(1) Any person who in a dust control area –

> *(b) has at any time or from time to time, whether before or after the commencement of this Ordinance, deposited or caused or permitted to be deposited on any land a quantity of matter which exceeds, or two or more quantities of matter which together exceed, twenty thousand cubic metres in volume, or such lesser volume as may be prescribed, and which in the opinion of the Director causes or is liable to cause a nuisance to persons residing or present in the vicinity of such land on account of dust originating from such matter becoming dispersed in the atmosphere.*

Although we do not anticipate the development to generate any significant levels of noxious or offensive gasses, the proponent needs to ensure that a registration certificate (air pollution permit) is obtained, if required. As duty of care, the proponent should implement the necessary mitigation measures set out in in order to limit emissions to air in the form of dust and emissions during construction and operations where applicable.

Hazardous Substance Ordinance (No 14 of 1974), As Amended

This ordinance provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable

nature or the generation of pressure thereby in certain circumstances. It covers manufacture, sale, use, disposal and dumping as well as import and export. These substances are grouped (Group I, II, III, and IV) in terms of section 3(1) of the mentioned Ordinance.

The responsibility lies with the proponent of the Project to conform to the Hazardous Substances Ordinance (No 14 of 1974). Caution is required in the storage and handling of any hazardous substances as it pose potential harm to humans and the natural environment if incorrectly applied or handled.

The Public Health Act (Act no 36 of 1919)

This Act covers a variety of aspects with relevance to the general wellbeing and health of the public. With relevance to the development and associated infrastructure this Act refers to the control of nuisance, but also the prevention of pollution of public waters.

Section 119 of this Act prohibits the existence of a 'nuisance' on any land owned or occupied by any person. Having relevance to the proposed development, the Act defines 'nuisance' as:

- *any stream, pool, lagoon, ditch, gutter, watercourse, sink, cistern, water closet, earth closet, privy, urinal, cesspool, drain, sewer, dung pit, slop tank, ash pit or manure heap so foul or in such a state or so situated or constructed as to be offensive or to be injurious or dangerous to health;*
- *any well or other source of water supply or any cistern or other receptacle for water, whether public or private, the water from which is used or is likely to be used by man for drinking or domestic purposes or in connection with any dairy or milk shop or in connection with the manufacture or preparation of any article of food intended for human consumption, which is polluted or otherwise liable to render any such water injurious or dangerous to health;*
- *any factory or trade premises not kept in a cleanly state and free from offensive smells arising from any drain, privy, water closet, earth closet, or urinal, or not ventilated so as to destroy or render harmless and inoffensive as far as practicable any gases, vapours, dust or other impurities generated, or so overcrowded or so badly lighted or ventilated as to be injurious or dangerous to the health of those employed therein;*
- *any factory or trade premises causing or giving rise to smells or effluvia which are offensive or which are injurious or dangerous to health;*
- *any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health;*
- *any other condition whatever which is offensive, injurious or dangerous to health.*

No other nuisance as per the definition above is associated with the proposed project *as such*, other than the main intent of treating water and disposing of brine. Care should however be taken during the operational phase to limit the smells in regards to the plant to other residential, recreational and or tourism activities and the fact that it could be categorised as causing a public nuisance under common law.

Part III of the General Regulations promulgated under the Health Act (Act 36 of 1919) focus on the prevention of pollution of public surface or ground water by various means.

The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS

The relevance of this policy for the proposed project stems from the fact that construction activities may involve the establishment of temporary construction workforce within the local village. Experience with other construction projects in a developing-world context has shown that, where construction workers have the opportunity to interact with local community, a significant risk is created for the development of social conditions and behaviors that contribute to the spread of HIV and AIDS.

In response to the threat the pandemic poses, MET has developed a policy on HIV and AIDS. This policy, which was developed with support from United States Agency for International Development (USAID), Gesellschaft für Internationale Zusammenarbeit (GIZ), provides for a non-discriminatory work environment and for workplace programs managed by a Ministry-wide committee.

The Labour Act (Act no 27 of 2004)

Under this Act, occupational exposure to employees is covered under the regulations relating to the Health and Safety of employees at work. Sub-contractors however will not be subject to any provisions of the Act, as sub-contractors are not considered to be employees in terms of Namibian common law.

Section 3(1) of the Regulations stipulates that in areas where it is suspected that noise levels are above 85dB(A) over an eight hour period, the employer shall take reasonable steps to reduce the levels to below 85dB(A). If this is not possible, noise areas (those above 85 dB (A)) must be clearly marked and measured every 36 months.

Employees who work in noisy areas must be provided with hearing protection devices free of charge and must undergo medical surveillance at least once every 36 months. Employees who are exposed to levels exceeding 85 dB (A) must be adequately and comprehensively informed and trained regarding the wearing of personal protective equipment and the potential risks of exposure to noise and the precautions to be taken to protect against the risks associated with the exposure to noise.

Chapter IV of the Regulations stipulates that all employees have the right to health and safety at the workplace. A Health and Safety Officer must be appointed in order to maintain a healthy and safe environment to all workers during the Construction phase. Prior to the promulgation of the Labour Act (Act of 1997), a large number of regulations had been gazetted dealing with different aspects of employer and employee rights and obligations. Included in these are regulations relating to health and safety in the workplace. The administration of these regulations, however, is assigned to various ministries by Proclamation 10/1997, as published in Government Gazette 1615.

National Gender Policy (2010 – 2020)

The National Gender Policy was designed with the objective to effectively contribute to the attainment of the objectives of Vision 2030, in order to create a society in which women and men enjoy equal rights and access to basic services. It serves also to provide opportunities for women and men to participate in and contribute towards the political, social, economic and cultural development of Namibia.

In order to address gender inequality and promote women's empowerment, the National Gender Policy will focus on the following key programme areas:

- Poverty and Rural Development;
- Education and Training;
- Health,
- Reproductive Health and HIV and AIDS;
- Gender based Violence;
- Trade and Economic Empowerment;
- Governance and Decision-Making;
- Media, Information and Communication;
- Environment;
- Issues of the Girl-Child;
- Legal Affairs and Human Rights;
- Peace-building,
- Conflict Resolution and Natural Disaster-Management; and
- Gender Equality in the Family Context.

The National Heritage Act (Act no 27 of 2004)

The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. The National Heritage Council has been established to identify, conserve, manage and protect places and objects of heritage significance.

Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains (defined in Part 1, Definitions 1), while Section 48 *ff* sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council.

1.1.9 Brine Wastewater

High salt-content brine is the desalination waste to be disposed of or recycled (IRENA, 2012). At present, it is mostly discharged into the sea or diluted and sprayed into an open space (ibid). However, the negative impact of brine on the ecosystems and the growing desalination capacity mean that a sustainable solution is needed for disposal and/or brine recycling to avoid environmental impacts (Gude, 2010).

Disposal Options

Table 4: Brine disposal and management options - Advantages and Disadvantages

Disposal into water body	• Low cost; • Easy to operate	• Environment damageable; • Violate regulations and laws
Deep well injection	• Able to isolate waste from water sources • More feasible and reliable than surface water disposal	• High requirement of assessing geological conditions; • Environmental impact is unknown.
Evaporation ponds Preferred Option	• Simple and easy to operate; • Low cost;	• Only efficient in arid and semi-arid areas; • Requires large area of land
WAIV technology	• Reduces land requirements compared to evaporation ponds; • More efficient compared to evaporation ponds.	• Availability only demonstrated on a pre- commercial scale; • Not feasible for large amounts of brine.
Membrane distillation	• Energy consumption is low compared with evaporation methods; • Could be easy coupled with solar ponds or other residual heat sources; • Available on industrial scale.	• Discharge at high temperature; • Fluxes are lower than in other membrane processes for industrial applications.
Two-stage reverse osmosis	• Significant improvement in desalination plants;	• Cost of reagents is required
Forward osmosis	• Increase water recovery significantly; • Low energy requirements.	• Require draw solutes and specifically designed membranes to improve its performance.
Electrodialysis	• Efficiently reduce fouling and scaling on membranes; • Reduce brine volume and concentrate the brine significantly; • Not only reject sale, but also other ions; • Low pressure operation compared with RO.	• Require technical operators; • Organic matter and colloids cannot be removed; • Pre-treatment is needed; • More expensive than RO; • High capital investment and cost.
Reverse electrodialysis	• Offset cost by generating power; • An innovative renewable energy; • Greatly reduce the waste quantity.	• The construction in water body may influence the ecosystem; • Requires a concentration difference; • Still under research, not mature for commercial use.
Integrated aquaculture scheme	• Reuse the rejected brine for aquaculture instead of disposing to environment; • Provides alternative water source for arid and semiarid regions; • Less capital investment and cost; • By connecting fish farming ponds with irrigation fields, the organic food and feed with high protein for humans and animals; • Provides food and feed with high protein for humans and animals.	• Requires large area of land; • Salt accumulation in the land in irrigation may cause land contamination; • The brine waste water needs to be fully tested before used in fish farming; • Different plants have different sensitivity to salinity; • The feasibility also depends on the local fishing market.

Source: (Morillo et al., 2014)

Compared to other desalination systems, RO desalination offers many benefits. The difficulty, however, comes with the disposal of wastewater. For every gallon of freshwater produced by RO, an equivalent amount of brine waste is discharged.

However, like most industrial processes, RO desalination produces a waste product that can be disposed of responsibly with minimal impact on the environment, and there are naturally-occurring locations where this is possible, such as where a freshwater source meets a saltwater source. Dumping extra-salty water in a region where salt water and freshwater are already mixing lessens its impact on the environment. Likewise, releasing brine waste over a large area of the seafloor (via a network of pipes, for example) also minimizes its impact on the environment. If neither of these is an option, brine waste can be naturally evaporated in ponds into commercial salt - a common practice for existing desalination plants.

Brine disposal practices are regulated and monitored by local environmental protection departments. As discussed in section 1.3.7 – 1.3.9 regarding wastewater disposal, the Department of Water Affairs (DWA) in the Ministry of Agriculture, Water and Forestry (MAWF), is the legal custodian of the wastewater treatment and disposal standards in Namibia. In accordance with Sections 68 to 75 of the Water Act No 11 of 2013, details of any treatment facility must be submitted to the DWA for the issuing of a wastewater / brine discharge licence. It is therefore necessary that any facility provided meet these requirements.

1.2 RISKS/IMPACT SCREENING AND CATEGORISATION

The identified risks or impacts during public consultation and project concept design were screened with the ESP principles to determine whether further assessment are required and potential impact of the risks. Most of them have **NONE-LOW** and **LOW TO MEDIUM** risks arising from the projects components and its activities. Low and mediums risks were identified in the principles below and the project is classified as **category B project**:

Table 5: Environmental, Social and Gender risks

No	Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
1	*Compliance with the Law (include gender)*	The project comply with the following Namibia's Law: Environmental Management Act (EMA) (2007). • *The Constitution of the Republic of Namibia (1990)* • *Namibia Vision 2030* • *National Climate Change Strategy & Action Plan 2013 – 2020* • *Water Resources Management Act (Act no. 11 of 2013)* • *Water & Sanitation Policies* • *Forestry Act (Act 12 of 2001), As Amended* • *Soil Conservation Act (Act 76 of 1969), As Amended* • *Pollution Control and Waste Management Bill (in preparation* • *Atmospheric Pollution Prevention Ordinance (No.11 of 1976), As Amended* • *The Public Health Act (Act no 36 of 1919)* • *The Ministry of Environment and Tourism (MET) Policy on HIV & AIDS* • *The Labour Act (Act no 27 of 2004)* • *National Gender Policy (2010 – 2020)*	**NONE**

		• *Code of Practice: Volume 2 – Pond Systems (2008)* • *Guideline for disposal of solids from water and wastewater treatment processes (2012)* • *National Policy on Climate Change for Namibia (2011)* Permits will be required for the disposal of the brine from the treatment plant and removal of any protected trees. Application for the brine disposal permit to the Ministry of Agriculture Water and Forestry who are supporting this project as per attached letter of support will me executed by NamWater.	
2	*Access and Equity (include gender)*	The water provided by the project will be distributed through the normal system managed by the relevant Village Councils. No residents will be denied access to the service that is provided. Women and children are identified as being vulnerable to climate change impacts (MET 2015). All consumers served by the project will be subject to the tariff system managed by the relevant Village Council or Regional Council. This follows a 'rising scale', where a minimum amount adequate for health and sanitation is provided at a basic fee. Consumers who use more (according to set thresholds) pay for the water at higher rates. This is part of the demand management system which seeks to provide a minimum amount of water for basic needs at an affordable fee, while curbing excessive use with higher fees.	**LOW**
3	*Marginalized and Vulnerable Groups (include gender)*	The project will not impose adversely impact on marginalised and vulnerable people in the selected areas. Displacement of people will not happen as NamWater existing land will be used and if extra land will be required NamWater will follow the	**LOW**

		procure of consulting with the relevant bodies e.g. Local Authority to acquire the land. The project will provide resilience opportunities for indigenous people by creating employment opportunities which will consider marginalised and vulnerable groups because of their previous disadvantage status. Given the nature of the project, gender awareness will be mainstream in the entire project to ensure the equal participation of both genders in decision making more especial women and children. The risks under this principles are low in nature will be managed by implementing the provided mitigation measures.	
4	*Human Rights (include gender)*	The project will empower communities in the project areas to exercise their human right as underlies in the Namibia's Constitution, Vision 2030 and the Environmental Management Act. The project will not violate any human right of the community members	**NONE**
5	*Gender Equity and Women's Empowerment*	The proposed project components and its activities will be planned, implemented and monitored by a public entity and fair and equitable gender representation will be implemented. As it is a national priority, effort will be made to ensure equal participation of women in the decision making of the project. Structural gender inequalities embedded in our society - unequal access to and control over material and non-material resources, assets and opportunities. The structures which organise the division of labour will ensure that no discrimination occur because of gender. The project will also provide capacity building and training and skills transfer to women in the project area for sustainable	**NONE TO LOW**

		livelihood generation.	
6	*Core Labour Rights (include gender)*	The project will ensure full compliance to the labour act and all labour related matters being it wages, recruitments etc will be conducted as per the labour act. The project will by no means violate the labour act.	**NONE**
7	*Indigenous Peoples*	Indigenous people such as San, Himba and Zemba are the most marginalized groups in Namibia. In Namibia, indigenous people are defined as those people who have special attachment to their land, who are marginalized, disposed and discriminated against. To date, indigenous people such as the San remain the landless and have yet to reap the benefit of democracy. Although indigenous people have formal right to participate, thy have no influence over national issues and rarely consulted on issues affecting them directly. It should be noted that these people have been subjected to unequal treatment and discrimination over many years and therefore special consideration of empowering them should be made in the proposed project to complement the special program which the government is currently undertaking. Furthermore, the Constitution of Namibia provides legislative and normative framework for the protection of indigenous minorities. These legislative and normative framework should be followed or consider in the proposed project to ensure the acceptance and success of the proposed project. The selected areas for the project is mostly inhabitant by the San and Damara people. The project will ensure that this people are included and consulate for this project.	**LOW**

8	*Involuntary Resettlement*	No resettlement will be needed in the pilot projects or because of the project.	**NONE**
9	*Protection of Natural Habitats*	Integrated in the project design to ensure that the natural habitats is protected during the implementation of all the project components. The project will ensure that the natural habitat is protected by complying with law mentioned in principle 1. At this stage it is envisage that the project will pose no risks to the natural habitat since the area which will be used to implement most of the project components is already disturb or have existing water supply infrastructure which belong to NamWater. For the selected project sites with existing infrastructure environmental clearance certificate were already obtained. In addition, the proposed project components concept design was also issued with an environmental clearance certificate which the findings will be validated once the detailed design is completed. Any component implementation that will pose threat to the natural habitat after the completion of the design will be implemented in compliance of the Environmental Management Act of 2012.	**LOW TO MEDIUM**
10	*Conservation of Biological Diversity*	Integrated in the project design to ensure that the flora and fauna are protected from any adverse impact during the implementation of the project components. The proposed project sites are already disturb and have environmental clearance certificates. The ESMP will be used to ensure the protection of biological diversity. At this stage, it is envisage that, the project will not	**LOW**

		cause any harm to the biological diversity if the mitigation measures will be implemented.	
11	*Climate Change*	The project is proposed to increase the adaptive capacity of the communities in the selected areas to the effect of climate change which is affecting water quality and reducing water supply. The project components will not introduce GHG in the atmosphere to contribute to the climate change, but rather uses renewable energy which is a mitigation measure to climate change.	**NONE**
12	*Pollution Prevention and Resource Efficiency*	Integrated in the design of the project that, the waste which will be generated from this project is managed in compliance with the law mentioned in principle 1. The project will generate brine which will be kept in sealed evaporation ponds to minimise leakages to ground water and thus contamination. Appropriate monitoring program of the waste generated from sites will be implemented in consultation with relevant stakeholders. Moreover, disposal permits for the brine will also be obtained from the Ministry of Agriculture Water and Forestry once the detailed design is completed as a requirement for issuance of the permits.	**LOWO TO MEDIUM**
13	*Public Health*	The project is aimed to improve the quality of water which is currently not suitable for human consumption. The health of the communities' members in the selected area will improve after the implementation of the project. At this stage, the current quality of water supplied to the	**NONE**

		communities members is causing a lots of health related issues. The project will not pose any impact on the health of the public.	
14	*Physical and Cultural Heritage*	No adverse impact related to cultural heritage have been identified. However, care should be taken if/when sites and objects (historical sites, historical artefacts, rock art sites, ruins, fossils and archaeological objects etc) protected by the law are encountered that these are reported to the National Heritage Council of Namibia as prescribed by this Act.	**NONE**
15	*Lands and Soil Conservation*	Restoration activities will helps land and soil conservation of sites during construction phase. The project will ensure that the removed land or soil during construction is retain to its natural states and re-vegetated when necessary.	**LOW**

1.3 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

The identified environmental and social risks or impacts shown in Table 6&7 were assessed and mitigation measures were developed for each risks. The IE will ensure that the identified mitigation measures are implemented to minimise the impacts of the identified risks.

Table 6: Potential environmental impacts/risks and the mitigation measures

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
PRE-CONSTRUCTION/DESIGN PHASE			
Non-compliance with the laws and other administrative orders of national and state government.	• Principle 1 (required) – Compliance with National Regulations	• The project is in compliance with major laws such as National Climate Change Strategy & Action Plan 2013 – 2020, Water Resources Management Act (Act no. 11 of 2013), and Environmental Management Act 2012. • Valid Environmental clearance certificates for the existing water supply infrastructure at the proposed sites are available. • Environmental clearance certificates for the proposed concept design are available. • Water abstraction permits available for all sites. • Apply for brine disposal permits once the detailed design is completed. • Apply for a permit from MAWF if any protected tree needs to be removed. • Collect and submit water samples pre and post operation (testing or piloting phase) to make sure the Water Quality Standards are achieved.	• NamWater
Land acquisition and potential removal of local animals	• Principle 1 (required) – Compliance with	• Ensure careful selection of site to avoid sensitive habitats or priority species • The land would be owned or leased by NamWater where possible. • Proper protocol or consultation with relevant	• NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	National Regulations • Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	stakeholders or local authorities will be followed to acquire a piece of land if necessary. • No unintentional removal of local animals will be allowed, and if required consultation should be made with the Ministry of Environment and Tourism.	
CONSTRUCTION PHASE			
Law changes during Construction Phase	• Principle 1 (required) – Compliance with National Regulations	• Proper communications should be done between NamWater and the various competent authorities (MET, MAWF etc.) to make sure what could change / is in process of being promulgated before construction starts, so that there are no surprises.	• NamWater • DRFN
Land and vegetation clearing	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservati	• Clear only the vegetation absolutely necessary for the plant construction and proper operations. • Only clear vegetation in phases, to minimise erosion and windblown dust. • Save the topsoil so that it can be reused later during rehabilitation. • Any Protected trees that needs to be removed, needs a permit from MAWF before this can be	• Main responsibility: **Contractor** • Supervision: **NamWater** • Coordination: **ECO**

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	on of Biological Diversity • Principle 14 – Physical and Cultural Heritage • Principle 15 – Lands and Soil Conservation	done. • If required ecological / botanical specialist must be appointed to assess the potential sites and the removal of any protected species where applicable.	
Protection of natural systems	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 14 – Physical and Cultural Heritage	• Disturbance of vegetation and faunal communities and their habitats is kept to a minimum. • Heavy construction vehicles should be kept out of the seasonal and ephemeral stream channels and the movement of construction vehicles should be limited where possible to the existing roads. • Riparian / Oshana areas disturbed should be rehabilitated, by the removal of alien vegetation where found and the re-vegetation of these disturbed zones with suitable indigenous vegetation. • All earthworks equipment operators shall be informed to cease operating immediately if any artefact is unearthed and to report the finding immediately to the Engineer / ECO and OTC, who in turn shall notify the National Heritage Council.	• Contractor • ECO • NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	• Principle 15 – Lands and Soil Conservation		
Pollution of soil and groundwater	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall events. • The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. • All tanks and/or mobile bowsers shall be situated in a bunded area. • The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas.	• Contractor • ECO • NamWater
Access, traffic and haul roads	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of	• The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times. • Fencing to be installed and properly maintained.	• Contractor • ECO • NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Biological Diversity		
Solid waste management	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	• The Contractor shall provide sufficient number of rubbish bins with secured lids to prevent animal scavenging. • No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the site.	• ECO • Contractor • NamWater
Hazardous substances	• Principle 12 – Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 –	• Hazardous chemical substances used during construction shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.	• Contractor • ECO • NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Lands and Soil Conservation		
Trenches	• Principle 10 – Conservation of Biological Diversity • Principle 15 – Lands and Soil Conservation	• Trenches shall be demarcated appropriately and securely and regularly monitored to ensure that pedestrians / animals (and vehicular) access to these areas is strictly prohibited.	• Contractor • ECO • NamWater
Erosion, water quality, and storm water	• Principle 9 – Protection of Natural Habitats • Principle 15 – Lands and Soil Conservation	• The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation. • The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works because of storm water flows. • Storm water should be managed appropriately at the culvert crossing where the pipeline is planned to go through underneath the road, so that blockage does not occur.	• Contractor • ECO • NamWater
OPERATIONAL PHASE			
Leakage of brine into soil and groundwater	• Principle 12 –	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall	• NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
from ponds (poor design, damage of lining during cleaning, flooding during heavy rain)	• Pollution Prevention and Resource Efficiency • Principle 13 – Public Health • Principle 15 – Lands and Soil Conservation	events. • Competence of operating staff employed at the plant • Develop a proper and up to date Operation and Maintenance (O&M) manual of procedures with technical guidelines • Routine and proper environmental monitoring of all aspects of the plant. • Establish regular reporting procedures on maintenance • Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged/ deficient equipment, as per the Operation and Maintenance Manual • Brine peak flow monitoring by monitoring the incidence of overflow at pump stations leading to the ponds and accurate recording of flow metering. • Monitoring of surrounding boreholes for potential contamination of surrounding sources or from the brine evaporation ponds.	
Non-sustainability of water sources being over used	• Principle 11 – Climate Change (indirect climate change aspects)	• Routine and proper monitoring of all aspects of the plant. • Proper monitoring of water being pumped / being used or wasted. • Regular checks on all aspects of water usage be reported	• NamWater
Health hazard to animals entering the	• Principle 9 – Protection	• The Plant and ponds need to be properly fenced to keep animals from entering the site.	• NamWater • Public

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
pond area	of Natural Habitats		• Local authorities
Collision of birds with wind turbines	• Principle 9 – Protection of Natural Habitats	• Further assessment and monitoring be done on the effects of the wind turbines on surrounding wildlife, especially birds once the detailed design is completed.	• NamWater
Potential of birds being attracted to the ponds	• Principle 9 – Protection of Natural Habitats	• Further assessment and monitoring be done on the effects of the ponds on surrounding wildlife, especially birds once detailed design is completed.	• NamWater
Fire or explosion of plant	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity	• Proper Risk Management Plan and Emergency Plans be in place. • Staff be trained and knowledgeable of the steps and procedures to follow in the event of a fire or explosion onsite. • Proper signs and emergency procedures be placed visible on site.	• NamWater
Used equipment such as RO filter disposal	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservat	• Proper disposal plan be provided on how to dispose of plant equipment, be it; to sell the equipment to be reused / recycled by a prospected buyer; or the disposal at a licenced landfill site. • A disposal certificate must be obtained and signed off by a licenced waste disposal specialist.	• NamWater

Identified risks/impacts	Environmental principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	ion of Biological Diversity • Principle 12 – Pollution Prevention and Resource Efficiency		
Improper reuse of the brine / salt-by-product	• Principle 9 – Protection of Natural Habitats • Principle 10 – Conservation of Biological Diversity • Principle 12 – Pollution Prevention and Resource Efficiency	• The use of brine (salt) produced during water treatment for agricultural / other uses is encouraged due to the high levels of nutrients inherently contained therein. • Proper research must be done to make sure that the brine / salt-by-product is used in the correct ways. • In addition, such use must be strictly controlled and monitored with restrictions on specific uses to ensure the health and safety of both the producers and the consumers of the products to which the brine / salt-by-product has been applied (DWAF, 2012).	• NamWater

Table 7: Potential social impacts/risks and the mitigation measures

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
PRE-CONSTRUCTION/DESIGN PHASE			
Human rights (water as a basic need)	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 11 – Climate Change • Principle 7 – Indigenous People. • Principle 13 – Public Health	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts.	NamWater
Land acquisition and potential removal of local people	• Principle 1 (required) – Compliance with National Regulations • Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 4 (required) –	• The land would be owned or leased by NamWater where possible. • Proper protocol will be followed by NamWater to acquire any additional piece of land if necessary. To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts;	• NamWater • Local authorities

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Human Rights (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	• Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples.	
A temporary loss of land and assets to the road servitude or areas to be occupied by project-related surface infrastructure	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples: • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts; • Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by	Public Local authorities NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		a project throughout the project's life-cycle. • Ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples.	
CONSTRUCTION PHASE			
A population influx (due to the presence of a construction workforce, as well as an influx of job-seekers into the area), with a possible concomitant increase in social pathologies and increased pressure on existing infrastructure and services.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• The recruitment policy used to employ people on the project must be fair and transparent. • The intention of giving preferential employment to locals is clearly communicated, to discourage an influx of job-seekers from other areas. • Inform local businesses about the expected influx of construction workers so that they could plan for extra demand. • Ensure that employment procedures/ policy of the contractor is communicated to local stakeholders, local farmers and Local Ward Councillor. • Have clear rules and regulations for access to the construction site to control loitering. • Consult with the local private security companies and Police to establish standard operating procedures for the control and removal of loiterers at the construction site. • Construction workers should be clearly identifiable by wearing proper	• Local authorities • NamWater • Public

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.	
Disruption of access routes and daily movement patterns by the construction. Access, traffic and haul roads.	• Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	• Unauthorised access to the construction site must be prevented through appropriate fencing and security. • When the construction period has ended the implementation of adequate rehabilitation measures to return the landscape and other changes to at least its original state. • The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times.	• NamWater • Public • Local authorities
Impacts on sense of place. Such impacts may arise because of the visual intrusion of project-related infrastructure, as well as noise and traffic impacts during construction Visual disturbance from wind turbines and solar panels	• Principle 4 (required) – Human Rights (see also gender policy) • Principle 7 – Indigenous People.	• Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs. • The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities.	• NamWater • Public
Dust caused by the	• Principle 6 (required) –	• Dust suppression is to be conducted	• Contractor

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
construction works and from movement of heavy equipment. During the construction phase, the local community and construction workers would be inconvenienced by the dust generated by the construction works.	• Core Labour Rights • Principle 7 – Indigenous People.	throughout construction. • The use of enclosures, screens and sheeting should be considered to contain dust. • The contractor is to take appropriate measures to minimise the generation of dust because of excavation works. Such measures include frequent spraying of water during low rainfall • Paved or surfaced roads should be used where possible. Where none are available, the required dust suppression measures as stipulated in this ESMP must be implemented. • Speed limits must be enforced in all areas to reduce the generation of dust. • Cover dump trucks before traveling on public roads or relevant as per ECO approved method statement. • Keep soil loads below the freeboard of the truck to minimise fugitive dust. • Revegetate disturbed areas as soon as possible after disturbance. • When feasible, shut down idling construction machinery. • Tighten gate seals on dump trucks. • No burning on site and close to settlements.	• NamWater • Public
Noise and vibration due to the construction works and from movement of heavy	• Principle 6 (required) – Core Labour	• Construction activities should be restricted to daytime hours between 07:00 to 18:00.	• Contractor • NamWater • Public

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
equipment. Movement of heavy machinery on existing local roads may be one of the core problems for the local community during the construction phase.	Rights • Principle 7 – Indigenous People.	• Adjacent households should be consulted and notified of any construction activities that could lead to excessive noise levels in advance. • The households should also be consulted if any night time construction activities are to take place.	
Improper ablution facilities provided	• Principle 6 (required) – Core Labour Rights	• Adequate chemical toilets must be provided for all staff. Alternatively, existing ablution facilities on site can be utilised if available. • The contractor camp: ensure the necessary ablution facilities are provided, with chemical toilets where such facilities are not available at commencement of construction. • Chemical toilets must be empty, kept hygienically clean and secured, they must be emptied / serviced on a regular basis to prevent them overflowing. • Adequate toilets and showers must be positioned at the right places.	• Contractor • NamWater • Local authorities
Socio-cultural differences and conflicts between migrant workers and the local community. Single men predominately occupy the construction camps which could create social	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see	• Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • Loitering of outsiders at either the construction site or at the construction camps should not be allowed. Local	• Local authorities • NamWater • Contractor

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
conflicts, usually because of cultural differences, alcohol abuse or being away from their wives or partners for extended periods of time. A possible reason for conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local community. An influx of unemployed job seekers could also add to the potential for conflict.	also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People • Principle 14 – Physical and Cultural Heritage	Police should be requested to assist in this regard. • Align awareness campaigns with those of other organisations in the area (i.e. the Local Council). • Control of access to construction camp. • Cease construction activities before nightfall, if possible. • Liaison with police, community policing forum and security stakeholders.	
Various social pathologies, such as drug/ alcohol misuse, abuse of woman and children and incidences of sexually transmitted diseases (STI's) may increase with the influx of job-seekers into the area.	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality	Social pathologies: • Implement HIV/ AIDS, alcohol abuse, drug abuse, and domestic violence prevention and awareness campaigns in the communities. • The contractors should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a minimum, include programmes to combat HIV/ AIDS and TB.	Contractor NamWater Public Local authorities

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
Crime is another social pathology that may increase. An inflow of construction workers and job seekers may also be accompanied by an increase in crime. Even if specific instances of crime are not because of the newcomers, they may still be ascribed to them by local communities.	and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People. • Principle 13 – Public Health	• The contractor should make HIV/ AIDS and STD awareness and prevention programmes a condition of contract for all suppliers and sub-contractors. Crime: • Regarding safety and security, construction workers should be clearly identifiable. • Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • The construction site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations. • Control of access to construction camp. • Cease construction activities before nightfall, if possible.	
Informal settlements. Once construction is concluded and the camp is vacated, it	• Principle 5 – Gender Equality and Women's	• Once construction is completed and the construction camp vacated, the camp must be demolished to avoid settling of	• Public • Local authorities • Contractor

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
may be illegally occupied.	Empowerment (see also gender policy) • Principle 7 – Indigenous People. • Principle 8 – Involuntary Resettlement	informal residents. Alternatively, if the camp is to be made available for use by other contractors on other projects, it should be "mothballed" until the new occupants take up residence.	• NamWater
Local economy opportunities and economic empowerment. The construction phase of the project will have temporary positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 7 – Indigenous People.	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. As for maximising employment benefits. Also: • Develop register of local SMMEs. SMME skills development as part of Corporate Social Investment (CSI) programme. Community education.	• Public • Local authorities • NamWater
Training and skills transfer. The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Principle 11 – Climate Change • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) –	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for construction related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc.	• NamWater • Contractor • Public • Local authourities

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	Core Labour Rights • Principle 7 – Indigenous People	• Identify vulnerable people, youth and women to take part in training and skills transfer programmes.	
OPERATIONAL PHASE			
Reluctance of beneficiaries to use desalinated water	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • Ongoing community education. • Establish a Stakeholder Liaison Committee.	• Public • NamWater • Local authorities
Sustained future operation, management and maintenance of the plants	• Principle 11 – Climate Change	• Plan the project in such a way to minimise social costs and maximise the benefits discussed.	• NamWater
Risk of skill loss – skilled staff leaving NamWater employ during / after Pilot Phase (Sustainability)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy)	• Local people can be trained part-time during the construction period to attain skills necessary for operation of the plant. • Details of the proposed project should be designed in consultation with community. • NamWater should support or endorse existing development programmes. • Skills transfer should be encouraged by identifying people with the potential	• NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	• Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights	• On-site or in-job training should be encouraged • Promote skills development programmes related to alternative economic activities	
Possible unaffordable water tariff for desalinated water Collapse of the South African Rand (and the N$)	• Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 7 – Indigenous People	• Provide subsidies to the schemes as per normal cross-subsidization norms applied by NamWater.	• Local authorities • NamWater • Public
Theft of solar panels and other materials	• Principle 7 – Indigenous People	• Site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the	• Public • Namibia Police • NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		construction phase. Liaison should also be established with existing crime control organisations.	
Visual impact of the plant, solar panels and wind turbine infrastructure.	• Principle 7 – Indigenous People	• Sensitisation must be done to provide effective mitigation measures and acceptance of the project where possible.	• Public • NamWater
Noise impacts form the plant and wind turbines	• Principle 7 – Indigenous People	• Adequate controls of heavy vehicle traffic to mitigate negative impacts such as noise and sense of place.	• Public • NamWater
Fire or explosion of plant	• Principle 7 – Indigenous People • Principle 13 – Public Health	• Health and safety protocols to be put into place. A method statement is required for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage. • No persons allowed on site other than project employees. • Minimal materials are stored. • All waste disposal bins will be emptied. • Materials are stored in leak-proof, sealable containers or packaging. • The store area is secure and locked. • Basic firefighting equipment must be available on site. Fire extinguishers are serviced and accessible. • The area is secure from accidental damage through vehicle collision, etc. • Emergency and contact numbers of the contractor are available and prominently displayed.	• NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
		• All stores will be secured. • Chemical toilets are empty, kept hygienically clean and secured. • 24-hour security will be on site during this period. • All trenches are barricaded with danger tape.	
Plant down-time (no water provision)	• Principle 2 – Access and Equity (see also gender policy)	• Water will be stored in existing / additional reservoirs to have back-up water for a minimum of 48h so that the problem can be fixed within that time frame. • If the problem persists after the 48h, water provision will temporarily switch back to the old water scheme standards.	• NamWater
Water quality changes (+) The project is aimed at improving the quality of water for NW to comply with the new water quality regulations of the Water Resources Management Act of 2013	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Regularly test water to ensure continuous compliance with water quality regulations.	• NamWater
Local employment and job opportunities. The construction phase of the project will have a positive impact on the local labour market. A positive	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable	• Unskilled job opportunities should be afforded to the local communities, as far as possible. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities.	• Public • Local authorities • NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
impact on continued permanent employment will be probable due to the proposed project as the long-term economic viability of the plant will be possible, following the plant expansion. (+)	Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People.	• Individuals with the potential to develop their skills should be afforded training opportunities. • Payment should comply with applicable labour legislation in terms of minimum wages. • Where local labourers are employed on a permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' construction phase positions have become redundant or once the construction phase comes to an end.	
Local economy opportunities and economic empowerment. The operational phase of the project will have positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 7 – Indigenous People	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. As for maximising employment benefits. Also: • Develop register of local SMMEs. • SMME skills development as part of Corporate Social Investment (CSI) programme. • Community education.	• Local authorities • Public (Business Sector) • NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
Improved health. The project will provide the local community with better quality water and this will have a positive impact on the health of the people. (+)	• Principle 11 – Climate Change • Principle 7 – Indigenous People • Principle 13 – Public Health	• Regularly test water to ensure continuous compliance with water quality regulations.	• NamWater
Savings on current expenses. Due to the better-quality water, medical expenses would be less (dentists) and less frequent need to replace water usage equipment (Geysers, kettles etc.). (+)	• Principle 11 – Climate Change • Principle 7 – Indigenous People	• Regularly test water to ensure continuous compliance with water quality regulations.	• NamWater
Self-esteem upliftment. With cleaner teeth comes higher self-esteem, less likelihood of depression and social betterment regarding relationships and even job performance. (+)	• Principle 2 – Access and Equity (see also gender policy) • Principle 3 – Marginalized and Vulnerable Groups (see also gender policy) • Principle 5 – Gender Equality and Women's Empowerment	• Regularly test water to ensure continuous compliance with water quality regulations. • Provide training in basic hygiene. • Provide counselling programmes.	• NamWater

Identified risks/impacts	Social principles	Planned mitigation measure	Institutions responsible for the implementation of the mitigation measures
	(see also gender policy) • Principle 7 – Indigenous People		
Training and skills transfer. The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Principle 11 – Climate Change • Principle 5 – Gender Equality and Women's Empowerment (see also gender policy) • Principle 6 (required) – Core Labour Rights • Principle 7 – Indigenous People	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc. • Identify vulnerable people, youth and women to take part in training and skills transfer programmes.	• NamWater

1.4 PURPOSE OF THE ESMP

In order for NamWater to be successful in procuring the necessary funding for the proposed desalination pilot studies, they are required to comply with certain AF Manuals and Procedural Documents. More specifically in relation to this ESPM, the AF has adopted the Environmental and Social Policy (ESP) in November 2013. This policy ensures that projects and programmes supported by the fund promote positive environmental and social benefits, and mitigate or avoid adverse environmental and social risks and impacts.

Managing these risks is integral to the success of the projects and programmes supported by the AF and the desired outcomes are described in the 15 environmental and social principles of the ESP. In March 2016 the Board amended the ESP to align it with the approved Namibian Gender Policy as well.

As part of the AF requirements, the following steps / tasks as outlined in the Environmental and Social Management System (ESMS) Manual needs to be incorporated. This Environmental and Social Management Plan (ESMP) has therefore been compiled for the identification and management of potential environmental and social risks / impacts during the construction, operation, and decommissioning phases of the proposed Pilot Desalination Projects. Best practice is proposed for the generic issues of construction management and supervision as well as the on-going management and operation of the Plant.

In terms of the Environmental Assessment Policy of 1994 and the Environmental Management (Act No 7 of 2007) (EMA), the activities required for the Plant and renewable energy components of the proposed project requires authorization from the Directorate of Environmental Affairs at the Ministry of Environmental and Tourism (MET: DEA).

1.5 SUMMARY OF IMPACTS

The potential negative environmental and social impacts identified in the ESA (construction, operation and decommissioning phases) are localized and temporary with possibility of mitigation actions
The projected environmental impacts for the various phases of the program are summarized below:

Preconstruction/design Phase
No negative impacts are expected during the preconstruction phase. Preconstruction activities include the acquisition of required permits for brine disposal, definition of alignments, and layout of construction limits, location and establishment of equipment storage of staging areas. This phase also includes public consultation and communication with stakeholders and the public on the scope, and possible impacts and proposed mitigation measures of the project to be prepared in this phase include:

- Utilities location and clearance maps
- Project Phasing Programme and Drawings
- Community Relations and Consultation Plan

Construction Phase
The expected negative environmental impacts and risks are generally the same risks encountered in the execution of construction projects involving multiple sites, linear alignments, and extended durations in urbanized and rural settings. The environmental impacts and risks are also compounded by those (risks) associated with the heavy construction, as in treatment plants. The projected impacts and risks all listed in Table 6 above for the construction phase.

Operations Phase
There are no projected major negative environmental impacts during the operation phase. The impacts are projected to be minor, most of which can be readily mitigated. The Impacts are related to storage of chemicals (chlorine, alum), discharge of backwash and sludge from treatment plants, contamination of the water within the distribution mains from leakages and breaks.

Decommissioning Stage
The life cycle of the typical treatment and power plants is 30-40 years. In that period there is the assumption that there would have been a number of modifications to the treatment and power plants and associate transmission and distribution system. Given the nature of the infrastructure is highly unlikely that the infrastructure will be replaced, but rather continuation replacement of aging parts. The general guidelines for environmentally sound decommissioning strategy include:

- *Avoidance of environmental harm during decommissioning;*
- *Likely Land uses are not prejudiced or likely to be prejudiced by residual pollution or potential pollutants on the land;*

- *That all waste material and products are managed and disposed of appropriately; and*
- *The land is not causing or likely to cause off-site environmental harm.*

1.6 IMPLEMENTATION ARRANGEMENTS AND RESPONSIBLE PARTIES

The various entities and their associated roles and responsibilities identified as being central to the adoption and implementation of this SEMP are discussed under the respective headings to follow.

PHASE	RESPONSIBLE PARTY
Planning and design phase	NamWater, DRFN, Consultants, Engineers
Construction phase	NamWater, DRFN, Consultants, Engineers
Operational phase	NamWater, DRFN, Consultants, Engineers
Decommissioning / equipment upgrade phase	NamWater, DRFN, Consultants, Engineers

1.6.1 National Implementing Entity (NIE) – DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

1.6.2 Executing Entity (EE) – NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)

- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments.
- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

1.6.3 Control Officer

Prior to the commencement of the construction phase an independent, suitably qualified and experienced Environmental Control Officer (ECO) shall be appointed by the Contractor to ensure that the mitigation rehabilitation measures are implemented and to ensure compliance with the provisions of this ESMP.

The role of the ECO is to oversee and monitor compliance with and implementation of the construction phase ESMP (i.e. Chapter 2). The ECO is therefore responsible for the following responsibilities:

i) Liaison with the community, Local Village Council, Engineer and Environmental Authorities regarding environmental and social matters related to the project;
ii) Monitoring of all the Contractor's activities for compliance with the various environmental and social requirements contained in this ESMP;
iii) Reviewing of the Contractor's Environmental Method Statements as well as ensuring the local Village Council approval thereof;
iv) Ensuring that the requisite remedial action is implemented in the event of non-compliance;
v) Ensuring the proactive and effective implementation and management of environmental and social protection measures;
vi) Ensuring that a register of public complaints and grievances is maintained by the Contractor and that any and all public comments or issues are appropriately reported and addressed as per the attached Grievance Mechanism;
vii) Routine recording and reporting of environmental and social activities on a monthly basis;
viii) Recording and reporting of environmental and social incidents;
ix) Notifying the Environmental Authorities immediately of any events or incidents that may cause significant environmental and/or social damage or breach the requirements of the ESMP; and
x) Environmental and Social Awareness Training courses to be conducted for the Contractor's workforce.

Site visits and reporting:

The ECO shall visit the site once a week for the first month of the construction phase. Based on the ECO's professional discretion, site visits can then be reduced to a minimum of once every month or as required.

Monthly compliance reports shall be submitted to NamWater and distributed as desired. The compliance report shall speak to the requirements of the ESMP and the project specifications. An external Environmental and Social Audit Report shall be considered six months after construction has been completed and submitted to the Environmental Authorities and NamWater.

2 CONSTRUCTION PHASE

2.1 INTRODUCTION

This ESMP section is to be ***included into all Tender and Contract documentation to ensure that the Contractor is aware of his obligations and is able to price the implementation of these requirements accordingly***. Failure to comply with these requirements could result in penalties or otherwise hold the Contractor accountable for any damages arising from irresponsible behavior or non-compliance with the requirements. This ensures that identified environmental issues receive adequate attention during the planning and construction phase.

2.2 SCOPE

The general principles contained within this section of the ESMP shall apply to all construction related activities. All construction activities shall observe any relevant environmental and social legislation and in so doing shall be undertaken in such a manner as to minimise impacts on the natural and social environment. Best practice shall apply where this ESMP does not describe the management measures for a construction activity. The ECO must be consulted should there be no management measures in this ESMP for a specific construction activity or where there is uncertainty as to how the measures in this ESMP should be implemented. In such an instance the ECO must determine the Best Available Technique(s) to avoid and/ or minimise potential impacts that an activity might have as per available best practice guidelines.

2.3 GENERAL

NamWater, as the Executing Entity (EE), is responsible for:

- Appointing a qualified independent ECO through the contractor;
- Ensuring that the objectives of the ESMP are given effect by including it in all contract documentation;
- Ensuring that all environmental and social impacts are managed in accordance with the ESMP;
- Ensuring that all monitoring and compliance auditing occurs in line with the ESMP;
- Ensuring that the environment is rehabilitated as far as practical to its natural state or existing land use practices; and
- Any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of these activities both in and outside the site boundaries.

With regard to the above, the Contractor shall in addition conduct his activities so as to cause the least possible disturbance to the existing environment, whether natural or man-made, in accordance with all the current statutory requirements. Special care shall be taken by the Contractor to prevent irreversible damage to the environment. The Contractor shall take

adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental and social laws and protection requirements. The Contractor shall supplement these steps with prominently displayed notices and signs in strategic locations to remind personnel of their social and environmental obligations.

A suitably qualified independent ECO shall be appointed by NamWater through the contractor to undertake the following tasks:

- Liaison with Contractor, Interested and Affected Parties (I&APs) / local community; and Engineer regarding environmental and social matters;
- Monitoring of all of the Contractor's activities for compliance with the various environmental and social requirements at regular intervals;
- Routine environmental and social auditing and reporting of the Contractor's performance against the ESMP;
- Reporting of environmental incidents and routine reporting of environmental issues associated with construction activities to NamWater, the Contractor and any relevant environmental authority; and
- Identifying environmental non-conformances and initiating measures to remedy such issues, including the institution of fines against the Contractor.

The Contractor shall construct and/ or implement all the necessary environmental and social protection measures in each area before any construction work may proceed. The Engineer/ ECO may suspend the Works at any time should the Contractor, in the Engineer/ ECO's opinion, fail to implement, operate or maintain any of the environmental or social protection measures adequately. The costs of such suspension shall be to the Contractor's account.

2.4 ENVIRONMENTAL AWARENESS

2.4.1 Environmental, social, health and safety induction course

The Contractor is responsible for informing employees and Sub-Contractors of their environmental and social obligations in terms of the ESMP and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental and social impacts.

The Contractor shall ensure that all his employees, and those of his Sub-Contractors, attend an Environmental, Social, Health and Safety Induction Course. This course shall be structured to ensure that attendees:

- Acquire a basic understanding of the key environmental and social features on the site and its immediate environs;
- Become familiar with the environmental and social controls contained in the ESMP;
- Are made aware of all protected areas and that the trapping, poisoning, and/ or shooting of animals is strictly forbidden. No domestic pets are allowed on site;
- Are informed that natural features (e.g. rock formations, cultural settings e.g. graves) are not defaced or marked for survey or other purposes unless agreed beforehand with the engineer. Furthermore, natural water sources (e.g. streams, groundwater resources) are

not allowed to be used for the purposes of swimming, personal washing, and the washing of machinery or clothes;

- Are made aware of the need to conserve water and minimise waste;
- Receive pertinent, written instructions regarding compliance with the relevant environmental and social management requirements (viz. typical environmental “do’s” and “don’ts”);
- Are made aware of any other relevant environmental or social matters as deemed necessary by the Engineer/ ECO;
- Are made aware of the importance of preserving archaeological sites;
- Receive detailed training in site health and safety requirements, emergency responses and site evacuation procedures in terms of the Contractor’s health and safety plan;
- Are aware that a copy of the ESMP is readily available on site and that all site staff are aware of the location and have access to the document;
- Are aware of the requirements of any approved Method Statements that have bearing on their activities, and where necessary, any specialised training required to ensure compliance with the approved Method Statements has been provided; and
- Are informed that employee information posters, outlining the environmental and social “do’s” and “don’ts” (as per the Environmental and Social Awareness Training Course) will be placed at prominent locations throughout the site.

The Environmental, Social Health, and Safety Induction Course should be conducted by the ECO and Contractor’s Health and Safety officer, who shall provide the site staff with an appreciation of the project's environmental and social requirements, and how they are to be implemented. All new staff coming onto site after the commencement of construction activities must also attend the Environmental, Social, Health and Safety Induction Course, and refresher courses should be undertaken on a quarterly basis. A detailed record of all training sessions, including a list of attendees must be compiled by the Contractor and submitted to the Project Manager on a regular basis.

The initial Environmental, Social, Health, and Safety Induction Course shall be held within 14 days from the site mobilisation date, and subsequent courses shall be arranged for all new employees arriving after the initial training course, also within 14 days of their arrival.

2.4.2 Toolbox talks

Environmental, social health and safety issues specific to each area of the works, shall form part of the daily toolbox talks in each area. These can be short 10 – 15 minute discussions on the environmental and social sensitivities of the general area and/ or the specific sections that would be worked on, on that day. The foreman responsible will provide feedback to his staff on their day-to-day environmental and social performance and address issues requiring attention and specific actions required. A synopsis of the topics discussed at each area shall be recorded on a register and submitted to the ECO on regular (typically weekly / monthly) basis. Environmental and social matters shall be dealt with in toolbox talks on a regular basis (typically at least once a week).

2.5 SOCIAL AWARENESS

2.5.1 Public Safety and Community relations

The Contractor shall take all reasonable measures to ensure the safety of people in the surrounding area and communities. Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/ or warning signs in English/local language, all to the approval of the Engineer/ ECO.

All unattended open excavations shall be adequately demarcated (fencing shall consist of orange mesh). Adequate protective measures must be implemented to prevent unauthorised access to the Working Area. No firearms shall be permitted on site.

The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the accommodation of a construction workforce on the local communities. The following mitigation and management measures are prescribed in this regard:

- Measures to combat HIV/ AIDS and other social ills:
  - NamWater should ensure the health of its employees and their dependants by adopting rigorous health programmes, which should, at a minimum, include programmes to combat HIV/ AIDS and tuberculosis (TB);
  - The Contractor should make HIV/ AIDS and Sexually Transmitted Diseases (STD) Awareness and Prevention programmes a condition of contract for all suppliers and Sub-Contractors;
  - The Contractor should provide an adequate supply of free condoms to all workers;
  - A voluntary counselling and testing programme should be introduced during the construction phase and continued during operations; and
  - Access at the construction site and camp should be controlled to prevent sex workers from either visiting and/ or loitering at or near these locations.

- Measures to prevent crime:
  - Construction workers shall be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags in order to gain access to the construction site;
  - All construction workers shall at all times wear the required Personal Protective Equipment (PPE); and
  - The Contractor should establish clear rules and regulations for access to the construction site and offices to control loitering. Consultation should occur with the local Village Namibian police branch to establish standard operating procedures for the control and/ or removal of loiterers.

- Measures to reduce traffic related incidents:
  - Ensure that road junctions have good sightlines;

- Transport the materials in the least amount of trips as possible, whilst being careful of overloading vehicles;
- Limit speed both on and off the site;
- Adhere to the speed limit; and
- Implement traffic control measures where necessary.

2.5.2 Employment Creation and skills development

Job creation, inward migration of workers and accommodation of a workforce within a small community have the potential to result in significant social impacts. NamWater and the Contractor must approach human resource management in a careful, cooperative and considered fashion so as to enhance the positive impacts, whilst minimising negative impacts associated with construction projects.

Given the proximity of the proposed project to Grunau, the community should be given special consideration in terms of the benefits arising from the project. In order to enhance the benefits of employment creation for local communities, it is recommended that the following measures be implemented:

- The Contractor shall establish a formal and organised recruitment process;
- Close collaboration must take place between the local Village Council, local Village Council Development Committee, NamWater and the contractor in relation to employees being appointed on contractual bases for this project;
- The Contract shall be encouraged to employ local labour (i.e. from Grunau) where possible;
- The Contractor shall identify vulnerable and marginalised people and provide assistance in the recruitment process;
- The Contractor shall be encouraged to recruit Namibian labourers;
- Recruiting by the Contractor must be conducted through a central office and no on-site hiring should be allowed;
- The Contractor shall inform job seekers that they are hired for a contract period only;
- The Contractor shall be encouraged to source construction materials locally as far as possible; and
- The Contractor shall be encouraged to make use of local sub-contractors.

In regards to skills, training the following are recommended:

- The Contractor shall establish a formal and organised skills training process;
- Close collaboration must take place between the local Village Council, local Village Council Development Committee, NamWater and the contractor in relation to employees being trained various skills from basic, intermediate to more advanced levels where practical for this project;
- The Contractor must do a skills audit to attain various skills needed in the local community.
- Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc.
- The Contractor must identify vulnerable people, youth and women to take part in training and skills transfer programmes.

2.5.3 Working times

The Contractor shall restrict construction activities to the hours of 06h30 - 18h00 during summer and 07h00 - 17h30 during winter on Mondays to Saturdays and no work will be permitted on Sundays or public holidays.

2.6 METHOD STATEMENTS

Any Method Statements required by the Engineer/ ECO or called for by the Project Specification shall be produced within such reasonable time as specified by the Engineer/ ECO or as stipulated in the Project Specification. Please refer to **Appendix B** for a generic example of a method statement. The Contractor shall not commence the activity until the Method Statement has been approved, except in the case of emergency activities. The Contractor shall allow the Engineer/ ECO a one week period for the review and approval of the Method Statement. Such approval shall not be unreasonably withheld.

The Engineer/ ECO may require changes to a Method Statement if the proposal does not comply with the Specification or if, in the reasonable opinion of the Engineer/ ECO, the proposal may result in, or carries a greater risk of, damage to the environment in excess of that which can be tolerated.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract or any other law except where this is specifically stated in the method statement.

Method Statements that shall be provided by the Contractor 14 days prior to the mobilisation on site include:

1. Mobilisation plan, covering:
    a. The location and layout of all offices, storage containers, gates and fences, fuel storage areas and protection bunds, material lay-down areas, ablution facilities, carpentry areas, hazardous chemical storage facilities, wash bays, workshops and works service and maintenance areas, oil separators and grease traps, storm-water layout, first aid facilities, recess, training, eating and meeting areas, central waste storage areas, access/ haul roads and any other facilities associated with the Contractor's yard;
    b. Security and access control to the site;
    c. The design and location of all waste storage facilities, in particular the central waste storage area;
    d. The central waste storage area shall include separate, weather proof, water-tight vessels/ skips for the disposal of hazardous waste and contaminated soil recovered during spills and for general waste respectively;

e. The system of collection and disposal of wastes, including the name and location of the point of final disposal, to an appropriate landfill site;
f. Initiatives for the control and recovery of litter on and around the Site and Contractor's yard;
g. Fuels and fuel spills: Methods of refuelling vehicles and details of methods for fuel spills and clean-up operations;
h. Sedimentation and Erosion Control: Sedimentation and erosion control of bulk earthworks and the management of sediment into rivers;
i. Stormwater management: Provisions to manage stormwater during the construction phase; and
j. Method of undertaking blasting.

2. Waste Management Plan, covering:
    a. The design and location of all waste storage facilities, in particular the central waste
    b. storage area;
    c. The central waste storage area shall include a separate, weather proof, water tight
    d. vessel for the disposal of hazardous waste and contaminated soil/water recovered
    e. during spills;
    f. The system of collection and disposal of wastes, including the name and location of
    g. the point of final disposal to an appropriately registered landfill site;
    h. Initiatives for the control and recovery of litter on and around the Site and
    i. Contractor's yard;
    j. The recovery, handling and disposal of construction and organic (vegetation debris)
    k. wastes; and
    l. Initiatives implemented to minimise, reuse or recycle all wastes generated during
    m. construction.

3. Emergency Preparedness Plan, covering:
    a. Contact details for relevant personnel, as well as their designations for:
        i. Emergency services and local authorities;
        ii. Private emergency services;
        iii. Contractor's personnel;
        iv. Engineer's personnel; and
        v. Employer's personnel.
    b. Fire Protection Plan, covering:
        i. The type and location of all fire protection equipment including fire beaters, fire extinguishers, knapsack sprayers, rake-hoes, fire-fighting tankers, etc.
        ii. Details regarding procedures to be followed in responding to a fire.
        iii. Fire prevention initiatives, including designated smoking areas, preventing the lighting of fires on site, the proximity of fire extinguishers during hot work, the storage of explosive or flammable substances, etc.
    c. Evacuation Plan, covering:
        i. How and to where personnel and site staff will be evacuated in the event of a fire, flood, bomb threat or other similar situation.
    d. Spill Response Plan, covering:

i. The protocols to be followed in the event of a large spill, including the recovery or neutralising of chemical spills on soil and in water environments;
ii. Day-to-day measures and protocols to be followed to prevent the spillage of potentially hazardous chemicals, with a focus on diesel and petrol fuel.

e. Inclement Weather Preparedness Plan, covering:
   i. Measures to be taken ahead of forecasted inclement weather that may result in high winds, heavy rains and flooding with the potential to cause damage to the works. Measures may include the removal of stationary equipment and stored chemicals from low-lying or excavated areas or the securing and / or removal of plant, waste, portable toilets ahead of such an event. Emergency preparedness earthworks initiatives used in the protection of the works areas where necessary should also be briefly described here.

2.7 ENVIRONMENTAL CONSIDERATIONS PERTAINING TO SITE LAYOUT

2.7.1 Employee eating and recess areas

The Contractor shall identify a suitable area, which is shaded and away from construction noise and dust, where employees can eat and take work recesses in relative comfort. The eating areas shall be provided with scavenger proof rubbish bins which are to be emptied into the central waste storage vessel/ skip daily. Potable water and other sanitary conveniences shall also be located within reasonable range of the designated eating area. The Contractor shall prevent his employees from eating or recessing anywhere else but in the designated eating area Security Guards.

Security guards that would look after construction equipment, materials and plant at night time shall not be allowed to leave the construction yard. They must be provided with an office to shield them from the weather. They shall be bound by the conditions contained in this EMP. Security guards must therefore be made aware of the conditions of the ESMP, especially with relation to 'no-go' areas, fires on site (refer to chapter 2.7.14), health and safety and protection of fauna and flora.

2.7.2 Ablution facilities

Temporary/ portable toilets shall be supplied by the Contractor for the workers at a minimum ratio of 1 toilet per 15 workers and be within walking distance of the work area. The toilets shall be placed at appropriate locations to the approval of the Engineer/ ECO. Toilets shall be kept in a good state of repair and shall be serviced at intervals sufficient to ensure that they are kept in clean and sanitary condition. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment is prohibited. Each toilet shall be stocked with toilet paper at all times. All toilets shall be secured to the ground to ensure that they do not overturn during high winds or for any other reason.

Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited, other than at the facilities provided.

2.7.3 Access, traffic and haul roads

The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times. Construction traffic shall be controlled to ensure minimal disruption to normal road users. All existing access roads that may be affected during construction shall be kept open and in a good state of repair, where this is not possible, unobstructed and safe alternative access routes through the Works must be provided under the guidance of the ECO.

The following mitigation measures are further proposed to limit the impact of traffic in the area:

- Access roads shall be widened to the minimum width required and should not exceed 5m;
- New roads shall not be constructed if the quality of existing roads deteriorates. Existing roads shall be repaired and maintained for the duration of the construction phase and beyond;
- Road construction methods should ensure good road surfaces to preclude vehicles driving off road to find smoother surfaces with less corrugations or potholes;
- The area to be cleared for road construction shall be as small as possible;
- Road surface shall be regularly assessed and upgraded where appropriate;
- No operator will operate any equipment when he is under the influence of alcohol;
- Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts etc. immediately (preferably offsite, if not offsite the ground surface must be protected by impermeable material and/ or drip trays);
- Ensure that road junctions have good sightlines;
- Transport the materials in the least amount of trips as possible;
- Limit speed both on and off the site;
- Adhere to the speed limit;
- Implement traffic control measures where necessary.
- Good driving and adherence to safety rules shall be adhered to at all times;
- Drivers must keep their headlights on when driving on gravel roads;
- Drivers must have the correct licence and training for the vehicles they are driving; and
- The following minimum standards for access roads should be followed:
    - Enter and exit roadways and construction areas should be demarcated at the entrances;
    - Erect signage to warn motorists about construction activities and heavy vehicle movement where appropriate;
    - Use 3-point turns and not U-turns and confine turning to the road; and
    - Prevent shortcuts between roads.

No new parking bay, haul or access road or passage of any sort shall be opened or be caused to be opened without the prior consent of the Engineer/ ECO. Establishing new borrow pits are strictly prohibited. Any contraventions of this clause shall result in penalisation.

2.7.4 Solid waste management

The Contractor shall provide sufficient number of scavenger proof rubbish bins with secured lids. Rubbish bins shall always be placed in pairs, to ensure that one is always present while the other is being emptied. As a minimum, rubbish bins shall be located at every point of entry/ exit to the site, any building, work area, ablutions facility or recess area. Areas where rubbish is likely to be generated in higher quantities shall be equipped with additional rubbish bins according to the activities occurring there and the volume of waste being generated. Areas requiring additional rubbish bin will include for example:

- Training and meeting facilities;
- Workshops;
- Stores;
- Canteens and eating areas;
- Materials laydown areas;
- Any work areas where outfitting (electrical, plumbing, mechanical) of structures is occurring (as required);
- Any mobile teams carrying out work away from the main site infrastructure, for example pipe or electrical installation teams, road building and maintenance teams, etc., shall carry a rubbish bin with them at all time and return all waste collected to the central storage area at the end of a day's work; and
- Any other area where an accumulation of litter and rubbish is noted or as instructed by the ECO.

No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the Site. Bins shall be emptied daily or as required. The waste may be stored temporarily on site in a central waste area that is weather and scavenger proof, as approved by the Engineer/ ECO. The Contractor shall, at his own cost, make available the time and resources required in recovering any litter or other wastes that have accumulated or have been dispersed as a result of his activities on the Site. The ECO shall monitor this strictly and institute strict penalties in the event of non-compliances.

The central waste storage vessel/ skip shall be emptied weekly or as necessary. All solid waste shall be disposed of at the closest registered waste disposal site. A copy of the waste disposal certificates shall be submitted to the Engineer/ ECO for record purposes.

2.7.5 Fuel and oil

The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. The tanks or mobile bowsers must be in good working order (i.e. not leaking). The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas. The tanks or bowsers shall be situated on a smooth impermeable surface (concrete slab or 250 micron plastic sheeting covered with at least 50mm of sand) with an earth bund. The impermeable lining shall extend to the crest of the bund. The volume of the bunded area shall be 130% the volume of the combined tank volumes stored therein. Provision shall be made for refuelling at the fuel storage area, by protecting the soil with an impermeable surface

(similar to that used for the storage area itself). The tanks and/ or bowsers shall be inspected daily for any leaks. If they are leaking, either the leaks must be fixed immediately or the bowser/ tanks must be replaced.

The Contractor shall prevent unauthorised access to the fuel storage area. No smoking shall be permitted in the vicinity of the fuel storage area. The Contractor shall ensure that there are adequate fire-fighting provisions located at the fuel storage area.

Should a mobile fuel bowser be used, all refuelling shall occur with appropriate measures in place to prevent spillages; these may include the use of drip trays, funnels, non-drip dispensing nozzles, and any other similar device. Regardless of the preventative measures in place, all mobile fuel bowsers shall carry a spill-kit that is adequately sized to contain at least a 200 litre spill, at all times.

2.7.6 Equipment maintenance and storage

All vehicles and equipment shall be kept in good working order and shall be operated by designated and competent operators. Leaking or damaged equipment shall be repaired immediately or removed from the Site. Where emergency, *in situ,* maintenance operations are required the Contractor shall ensure that the soil or vegetation does not become contaminated. Drip trays shall be provided in construction areas for stationary and parked plant as well as for the emergency servicing of vehicles. Drip trays shall be inspected and emptied daily, or as required. The contents of the drip trays shall be disposed of at an appropriately authorised facility and proof thereof shall be submitted to the Engineer/ ECO.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only during which the use of detergents for washing shall be restricted to low phosphate and nitrate containing, low foaming type detergents. Washing of equipment will only be allowed in a wash bay, at the site camp, approved by the Engineer/ ECO.

The Contractor shall ensure that oil and lubricant containers are stored in an area where the ground has been protected. The containers shall be inspected regularly to ensure that no leakage occurs. When oil/ lubricants are dispensed, the proper dispensing equipment shall be used, and the storage container shall not be tipped in order to dispense the oil/ lubricant. The dispensing mechanism of the oil/ lubricant storage container shall be stored in a waterproof container when not in use. The Contractor shall take all reasonable precautions to prevent accidental and incidental spillage during the use of oils.

In the event of oil/ lubricant or other hazardous spill, the source of the spillage shall be isolated, and the spillage contained. The Contractor shall clean up the spill by removing the contaminated soil to the hazardous waste vessel/ skip and the application of absorbent material to the affected area. Treatment and remediation of the spill area shall be undertaken to the reasonable satisfaction of the Engineer/ ECO.

2.7.7 Stockpiling and stockpile areas

Plant (i.e. machinery) and materials shall be stored within the demarcated construction camp or batching areas. Where this is not feasible, the Engineer/ ECO will identify additional sites for stockpiling within the Working Area. Where possible, stockpiled materials shall be stored off the ground on scaffolding and care shall be taken to minimise disturbance to the vegetation and topsoil.

Soil, sand, and gravel stockpiles shall be convex in shape and shall be located so as to cause minimal disturbance. Stockpiles shall be so placed as to occupy the minimum width compatible with the natural angle of repose of the material, and measures shall be taken to prevent the material from being spread over too wide a surface. The Contractor shall ensure that all stockpiles do not result in the damming of water or run off, or are themselves washed away. Stockpiles shall be placed to not obstruct or pollute any storm water or drainage paths.

2.7.8 Materials

a) Materials handling, use and storage

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions, including “no-go” areas and designated haul routes.

All material shall be stored within the designated Site boundaries and all material stockpiles shall be located no less than 20m from any water resource. The Contractor shall ensure that all material lay-down areas, workshops and stores, including temporary lay-down areas within the Works, are kept in a neat and orderly fashion on a daily interval, and to the satisfaction of the Engineer/ ECO. The Contractor shall set aside the time and resources required to remedy any contraventions of this clause at his own expense.

Materials shall be appropriately secured and covered to ensure safe passage between destinations. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

b) Hazardous substances

Hazardous chemical substances used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation. Potentially hazardous substances shall be stored, handled and disposed of as prescribed by the Engineer/ ECO.

The Contractor shall provide a separate weather-proof, impervious vessel/ skip at the central waste storage area for the temporary storage of hazardous, potentially hazardous and contaminated materials. Waste from this vessel/ skip shall be disposed of at a landfill site that is registered to receive such waste. A copy of the Certificate of Disposal issued by the landfill shall be submitted to the Engineer/ ECO after every deposit.

2.7.9 Cement and concrete batching

The batching of concrete shall take place on a smooth, impermeable surface (plastic) and shall be enclosed with a bund and sloped toward a sump to contain any spillages. Concrete batching shall take place at least 20m away from any water resource, e.g. vegetated drainage lines, to avoid contaminated water and/ or sediment entering the resource. All waste water resulting from batching of concrete shall be contained and disposed of appropriately and shall not be discharged into the environment unless treated to acceptable standard, as determined by the Engineer/ ECO. Where concrete trucks are used, the Contractor shall ensure that dumping of the drum-wash does not occur directly onto the ground. If needed, facilities for the handling of the concrete contaminated wash-water shall be established to the satisfaction of the Engineer/ ECO. Any spillages of concrete or concrete-truck-drum-wash-water shall be cleaned-up immediately and disposed of through the solid waste disposal system.

The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the pour and disposed of as part of the solid waste disposal system. Empty cement bags shall be collected continuously and stored in temporary weatherproof containers, where they are protected from dispersion by wind and shall be disposed of regularly via the solid waste disposal system.

2.7.10 Blasting

Blasting is to be executed by a suitably qualified person with all the relevant blasting certificates/ registrations. All relevant Namibian blasting regulations shall be strictly adhered to. Controlled blasting techniques shall be employed to minimise dust and fly rock (i.e. loose pieces of rock that could be propelled into the air) during blasting.

All communications should go through proper channels of notification of the intend to blast so that proper safety measures can be put in place with the proper local community officials.

2.7.11 Dust

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activity, to the satisfaction of the Engineer/ ECO. Dust suppression measures shall be agreed upon in consultation with the Engineer/ ECO. Appropriate dust control measures include the following:

- Construction vehicles shall only use designated roads;
- Dust carrying materials shall be secured and properly covered on transportation vehicles before they leave the site; and
- During high wind conditions the contractor must make the decision to cease works until the wind has calmed down.

2.7.12 Noise

The Contractor shall limit noise levels by implementing the following:

- Install and maintain silencers on machinery;
- Appropriate directional and intensity settings are to be maintained on all hooters and sirens;
- No amplified sound shall be allowed on Site other than in Emergency situations; and
- Drivers and operators are to be instructed to not use their hooters unless absolutely required (i.e. operators of machinery should not use hooters for the purposes of general communication, which is typically seen on construction sites).

2.7.13 Trenching (only where applicable)

Trenches where envisaged shall be demarcated appropriately, using orange mesh, and securely and regularly monitored during operations to ensure that pedestrian (and vehicular) access to these areas is strictly prohibited. Where appropriate, sign boards, alerting pedestrians and road users to the potential dangers presented by the construction activities, shall be erected. The Contractor shall ensure that the time a trench is left exposed is kept to a minimum, and that open trenches are inspected on a daily basis for animals which may have fallen or become trapped. Animals found trapped shall be rescued and released into the wild. If poisonous animals/ reptiles such as snakes are found, the DNP and/ or a snake handler must be contacted to rescue the snake/ animal. A local snake handler must be identified before works start and his contact details shall be readily available.

2.7.14 Fire control

Fires are only permitted in designated areas and shall not be left unattended. These areas must first be discussed and approved by the DNP officials. If such areas are approved by the DNP officials, cooking places shall be located at a safe distance from fuel/ hazardous materials storage area and vehicle parking areas. All grass and bushes shall be removed around fireplaces. Fire extinguishers shall be readily available in the construction camp. Any fires that occur outside of designated areas shall be reported to the Engineer/ ECO immediately. Employees shall be made aware that the collection and removal of firewood is prohibited, except where indicated by the contractor as clearing takes place. The Contractor shall either provide firewood or to limit the use thereof; provide gas or fuel efficient stoves. Smoking shall not be permitted in those areas where there is a fire hazard. Burning of waste for disposal purposes is not permitted.

The Contractor shall be responsible for ensuring that immediate and appropriate actions are taken in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The Contractor shall ensure that there is at least one fire extinguisher at the entrance to the site and at the recess area. A fire extinguisher shall be present whenever undertaking any form of hot work, i.e. welding, gas cutting, angle grinding, etc. All transport, earth moving equipment, and materials handling equipment on the Site shall be fitted with fire extinguishers.

All fire extinguishers shall be serviced at the specified intervals and all other fire-fighting equipment shall be maintained in a good state of repair.

2.7.15 Emergency procedures

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills, which shall include notifying the Engineer/ ECO. The Contractor shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times. Treatment and remediation of spills shall be done to the satisfaction of the Engineer/ ECO.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The affected areas shall be cordoned off and secured. The Contractor shall ensure that there is always sufficient supply of absorbent material on Site to absorb/ breakdown or encapsulate at least a 200ℓ liquid hydrocarbon spill. Any soil contaminated by such a spill must be removed and disposed of at an appropriately registered waste site.

Emergency equipment including spill kits and fire extinguishers shall be positioned at accessible locations near to areas or facilities where such emergencies may arise.

2.7.16 Erosion, water quality, and storm water control

The Contractor shall take all reasonable steps to prevent or remediate damage to the environment resulting from the Works in the form of erosion and sedimentation. The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works because of storm water flows. A preventative approach must be adopted whereby the extent of clearance and disturbance is limited to those areas required to complete the Works (i.e. a working corridor of 15 m). If required, the Contractor shall establish necessary storm water control mechanisms in agreement with the engineer, to effectively control the movement of water onto, through and off the construction site.

The Contractor shall establish, in agreement with the Engineer/ ECO, a suitable mechanism, where necessary, for containment and treatment of contaminated water emanating from the Works or associated activities, i.e. settlement or sedimentation ponds/ oil separators. A plan must be submitted and approved by the ECO/ Engineer.

2.8 COMPLIANCE AND PENALTIES

2.8.1 Compliance

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the works.

It is thus required that the Contractor shall comply with the environmental requirements on an on-going basis and any failure on his part to do so will entitle the Engineer/ ECO to certify the imposition of a penalty, as detailed below, if such non-compliance is not corrected within a period of one week of notification thereof.

2.8.2 Penalties

Penalties will be issued for certain transgressions. Penalties may be issued per incident at the discretion of the Engineer/ ECO. Such penalties will be issued in addition to any remedial cost incurred as a result of the non-compliance with this Specification. The Engineer/ ECO will inform the Contractor of the contravention and the amount of the penalty, and shall be entitled to deduct the amount from the monies due under the Contract.

Penalties for the activities detailed below, will be imposed by the Engineer/ ECO on the Contractor and/ or his Sub-Contractors.

a)	Any employees, vehicles, or things related to the Contractor's operations operating outside the designated boundaries or a "no-go" area.	N$ 5,000
b)	Persistent and un-repaired oil leaks from machinery.	N$ 2,000
c)	Persistent failure to monitor and empty drip trays timeously.	N$ 2,000
d)	The use of inappropriate methods for refuelling, resulting in spillages.	N$ 2,000
e)	Litter on site associated with construction activities.	N$ 2,000
f)	Deliberate lighting of illegal fires on site.	N$ 2,000
g)	Any employee eating meals on site, outside of the defined eating area.	N$ 2,000
h)	Employees not making use of the site ablution facilities.	N$ 2,000
j)	Failure to empty waste bins on a regular basis.	N$ 200
k)	Unauthorised removal of vegetation.	N$ 500
l)	Hunting, trapping and collection of animals (per unit taken).	N$ 15,000
m)	Failure to implement specified noise controls.	N$ 2,000
n)	A spillage, pollution, fire or any damage to the environment resulting from negligence on the part of the Contractor.	N$ 5,000
o)	Damage to vegetation or ground arising from equipment leaving designated haul or access routes.	N$ 5,000
p)	Failure to submit and, or proceeding with work without having or deviating from an approved method statement, for those task requiring a method statements in terms of the EMP.	N$ 5,000

For each subsequent similar offence the penalty shall be doubled in value to a maximum value of N$ 20,000. The Engineer/ ECO shall be the judge as to what constitutes a transgression in terms of this clause.

2.9 MEASUREMENT AND PAYMENT

2.9.1 Basic principles

Except as specified below or in the Project specifications or as Scheduled, no separate measurement and payment will be made to cover the cost of complying with the provisions of this ESMP and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.

2.9.2 Scheduled items

All requirements of the environmental management specification

All work not measured elsewhere, associated with complying with any requirement of the environmental management Specification shall be as a measured sum. The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Schedule of Quantities or shown on the drawing(s).

Method statements: Additional work

No separate measurement or payment will be made for the provision of Method Statements but, where the Engineer/ ECO requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the work required, provided it could not reasonably have been foreseen by an experienced Contractor.

Work "required by the project specification"

Where a clause in this Specification includes a requirement as "required by the Project Specification", measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment clause of the Project Specification.

2.10 SUMMARY OF CONSTRUCTION PHASE MANAGEMENT ACTIONS

Table 1: Construction Phase Management Table

Aspect	Management Objective	Management actions	Responsibility
Responsible management	To ensure that construction activities are carried out so as to cause the least possible disturbance to the existing amenities, whether natural or man-made.	• The Contractor shall take adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental laws and protection requirements. • A suitably qualified independent ECO shall be appointed by the Contractor. • The Contractor shall construct and/or implement all the necessary environmental protection measures in each area before any construction work may proceed.	Contractor
Environmental awareness	To ensure that all employees and Sub-Contractors are informed of their environmental obligations.	The Environmental, Health, and Safety Induction Course should be conducted by the ECO and Contractor's Health and Safety officer.	ECO
		The foreman responsible will provide feedback to his staff on their day-to-day environmental performance and address issues requiring attention and specific actions required.	Contractor
Safety to the public	To reduce the risks posed by the project to the public.	• Where the public could be exposed to danger by any of the Works or site activities, the Contractor shall provide flagmen, barriers, and/or warning signs in English. • No firearms shall be permitted on site without the prior approval of the Project Manager. The Contractor shall implement appropriate measures to limit any adverse social impacts associated with the establishment of a construction camp and/or the accommodation of a construction workforce on the local communities.	Contractor
Human resource and opportunities management	To ensure that job creation, inward migration of workers and accommodation of a workforce within a small community does not result in significant social impacts.	In order to enhance the benefits of employment creation for these communities, it is recommended that the Contractor shall establish a formal and organised recruitment process in line with this EMP.	Contractor
	Construction activities shall be restricted to specified hours in order to limit disturbance to the public.	The Contractor shall restrict construction activities to the hours of 6h30 - 17h00 during summer and 07h00 - 17h00 during winter on Mondays to Saturdays and no work will be permitted on Sundays or public holidays.	Contractor

Aspect	Management Objective	Management actions	Responsibility
Dust	To limit dust levels.	Appropriate dust control measures must be implemented.	Contractor
Noise	To limit noise levels.	Appropriate measures shall be implemented to limit noise levels.	Contractor
Method statements	To ensure effective and formal communication between the Project Management Team and the Contractor on construction issues throughout all stages of the project	System regarding method statement compilation, submission, review and approval to be rigorously implemented.	Contractor / ECO
		Method Statements that shall be provided by the Contractor 14 days prior to the mobilisation on site include: • Mobilisation plan; and • Operational and rehabilitation plan.	Contractor / ECO
Environmental considerations pertaining to site layout	Suitable area identified where employees can eat and take work recess.	• The Contractor shall identify a suitable area, which is shaded and away from construction noise and dust, where employees can eat and take work recesses in relative comfort. • The eating areas shall be provided with scavenger proof rubbish bins, potable water and other sanitary conveniences.	Contractor
Ablution facilities	Temporary toilets shall be provided by the contractor.	• Temporary / portable toilets shall be supplied by the Contractor for the workers at a maximum ratio of 1 toilet per 15 workers and be within walking distance of the work area. • The toilets shall be placed at appropriate locations to the approval of the Engineer / ECO. • Toilets shall be kept in a good state of repair and shall be serviced at intervals sufficient to ensure that they are kept in clean and sanitary condition.	Contractor
Access, traffic and haul roads	Construction traffic shall be controlled to ensure minimal disruption to normal road users.	The Contractor shall be held responsible for the control of all project related traffic, including that of his suppliers, in ensuring that vehicles associated with the project remain on designated routes and within the designated working times.	Contractor
Solid waste management	To ensure that there is no illegal disposal of waste.	• The Contractor shall provide sufficient number of rubbish bins with secured lids. • No waste materials, including domestic, organic or construction wastes shall be burnt, dumped or buried on the Site.	Contractor
Fuel and oil	To ensure that all liquid fuels are stored appropriately and adequate fire-fighting equipment is stored on site.	• The Contractor shall ensure that all liquid fuels are stored in tanks or mobile bowsers with lids that are kept firmly shut. • All tanks and/or mobile bowsers shall be situated in a bunded area.	Contractor

Aspect	Management Objective	Management actions	Responsibility
		• The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel storage areas.	
Equipment maintenance and storage	All vehicles and equipment are kept in good working order.	• Leaking or damaged equipment shall be repaired immediately or removed from the Site. • Drip trays shall be provided in construction areas for stationary and parked plant as well as for the emergency servicing of vehicles.	Contractor
Stockpiling and stockpile areas	All plant and materials shall be stored in designed areas to minimise the disturbance to vegetation and topsoil.	Plant and materials shall be stored within the demarcated construction camp or batching areas.	Contractor
Materials handling, use and storage	All delivery drivers are informed of the on-site procedures and restrictions.	• The Contractor shall ensue that any delivery drivers are informed of all procedures and restrictions, including “no-go” areas and designated haul routes. • All material shall be stored within the designated Site boundaries.	Contractor
Hazardous substances	Any hazardous substances are stored appropriately.	• Hazardous chemical substances used during construction shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.	Contractor
Cement and concrete batching	Cement and concrete batching takes place in designated areas.	• The batching of concrete shall take place on a smooth, impermeable surface (plastic) and shall be enclosed with a bund and sloped toward a sump to contain any spillages. • The Contractor shall take all reasonable measures to prevent the spillage of cement / concrete during batching and construction operations.	Contractor
Trenching	Trenches are appropriately demarcated and secured.	Trenches shall be demarcated appropriately and securely and regularly monitored to ensure that pedestrian (and vehicular) access to these areas is strictly prohibited.	Contractor
Fire control	To reduce the risk of fires	• Fires are only permitted in designated area and shall not be left unattended. • Fire extinguishers shall be readily available.	Contractor
Emergency procedures	All employees are aware of emergency procedures.	• The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills. • The Contractor shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times.	Contractor
Erosion, water	To prevent or remediate damage to the	• The Contractor shall take all reasonable steps to prevent or remediate	Contractor

Aspect	Management Objective	Management actions	Responsibility
quality, and stormwater management	environment resulting from the Works in the form of erosion and sedimentation shall be taken.	damage to the environment resulting from the Works in the form of erosion and sedimentation. • The Contractor shall immediately remedy any situation that is or has the potential to result in soil erosion, water pollution and sedimentation from the works as a result of storm water flows.	
Penalties	To ensure that environmental requirements are strictly adhered to.	Penalties will be issues for certain specified transgressions.	Contractor

3 OPERATIONAL PHASE

3.1 INTRODUCTION

The Operational Phase Section of the Environmental Social Management Plan relates to the management and mitigation measures required to ensure that the proposed Pilot Desalination Study with Renewable Energy is operated in a manner that demonstrates responsible, precautionary environmental and social management.

The Operational ESMP will address specific areas of concern in terms of the long-term environmental and social management of the affected environment and community and is intended to serve as a guide to the on-going management of the Desalination Plant as well as the affected environment. The Operational ESMP will therefore aim to provide NamWater with the necessary tools to ensure that the potential impacts on the natural environment and the community due to the Desalination Plant during operation are minimised. Moreover, it will aim to ensure that the infrastructure is operated and maintained in an environmentally and socially sensitive and sustainable manner, and that the operation of the infrastructure does not result in reasonably avoidable environmental and social related impacts.

However due to the exact methods of operation not yet known at this stage, NamWater together with the operational team need to amend and adjust this Operational ESMP in order to be more site specific.

The general operational information is summarised in tabular format illustrating the activity, aspect, impact, mitigation measure, performance indicators, resources, schedule and verification. These criteria are listed and explained below:

The following components are identified/ described:

- **Activity**: component/ activity of the project for which the impact has been identified;
- **Aspect**: the aspect of the above activity which will be impacted;
- **Impact**: the environmental impact identified and to be mitigated;
- **Mitigation measure**: measures identified for implementation in terms of environmental management to reduce, rectify or contain the identified environmental impact – mitigation is divided into the following:
    - **Objective**: desired outcome of mitigation measure,
    - **Mechanism**: method of achieving the objective;
- **Performance indicators**: outcomes that will indicate achievement of objective/s;
- **Responsibility**: party or parties identified for implementation of mitigation measure/s;
- **Resources**: available resources to aid implementation of mitigation;
- **Schedule**: timeframe in which identified impact and mitigation measure is anticipated to occur; and
- **Verification**: party or parties identified as responsible for review and assessment of final outcome.

3.2 MAINTENANCE PROCEDURES

The optimal operation and effective maintenance of the Desalination Plant are important in protecting the environment and ensuring that resources are not wasted and environmental and social incidents arising out of equipment or infrastructure failures, are avoided. A more detailed Operational and Maintenance (O&M) Manual will be compiled for the Plant by a suitable qualified and experience person in regards to the specific O&M of a Desalination Plant as well as the renewable energy technicalities. The manual will provide detailed guidance on the operation of all machinery and associated systems as well as related maintenance procedures, including maintenance schedules. Implementation of this manual by NamWater will facilitate the proactive management of potential risks and thus result in impacts on the receiving environment being averted. Accordingly, the O&M Manual shall be regarded as an integral component of the ESMP.

The O&M Manual will include, but not be limited to, the following sections:

- Works Safety including personnel safety and equipment safety;
- Equipment summary;
- Works description;
- Disposal of waste (e.g. brine);
- Works operation, including:
    - Commissioning start up (Pre-start-up checks), and
    - Normal operation (Operation and daily operation checks).
- Maintenance schedules, including
    - General care and maintenance,
    - Maintenance log,
    - Daily operating checks,
    - Monthly Maintenance Procedures, and
    - Annual Maintenance Procedures.
- Equipment replacement schedules, including
    - Proper removal / recycling and disposal of life-ending equipment;
    - Proper replacement of new equipment; and
    - Re-use of equipment elsewhere where possible.

The maintenance procedures set out in the O&M Manual, will provide specific guidance in terms of the monitoring and maintenance of the key mechanical and electrical equipment. These procedures will specify the equipment item and specific component of each piece of equipment requiring checking, the scope and nature of the check that is to be carried out including detailed instructions related to the specific check, and the programme for conducting each check. Completed schedules will be kept on site to provide a complete compliance record.

3.3 EMERGENCY PREVENTION, PLANNING, AND RESPONSE

The O&M Contractor shall compile an emergency plan for approval by NamWater. The plan shall provide procedures for the following potential emergency scenarios and response requirements:

- A major spill on site;
- A major spill *enroute* (i.e. traffic accident);
- The rupture of chemical storage tanks;
- A site evacuation procedure (in the event of bomb threat or fire);
- Medical emergency (including the need to airlift a patient);
- Fire inside the facility;
- Major pipe burst; and
- An explosion (i.e. transformers).

For all emergency scenarios described above, the O&M Contractor shall identify suitable measures to reduce the risks of such emergencies occurring and provisions required to respond to such emergencies effectively, or until emergency services can intervene.

A copy of the emergency plan shall be provided to NamWater, the relevant emergency services, one onsite and one off-site copy. The emergency plan shall contain layout drawings of the plant which shows general access information and layout, such as roads, access ladders, doors, manholes, alternative escape routes, fire extinguishers, first aid provisions, water access points, etc. The plan will also show the location of potential hazards, such as LPG or Chlorine gas bottles, chemicals stores (including the type, max volume and nature of chemical stored there), fuel and oil stores.

All staff shall be made aware of the emergency procedures during their induction training. Emergency drills should be carried out on an annual basis to ensure proficiency of staff and adequacy of procedures. Procedures should be amended and updated based on new information or drill experience, where required.

All permanent staff should undergo basic first aid training. At least one fully trained first aider should be on site during every shift. The first aiders will be responsible for maintaining all emergency equipment, ensuring that all emergency equipment and first aid provisions are routinely inspected and replaced or serviced as required.

A project signboard shall be provided at the entrance to the site which will provide the relevant contact details for key staff of the O&M Contractor and NamWater. A list of key emergency telephone numbers shall be posted near the telephone.

NamWater shall ensure that the O&M Contractor does not utilise the premises for any activity not directly associated with the operation or maintenance of the plant.

3.4 EMPLOYMENT CREATION AND SKILLS DEVELOPMENT

Whilst the operation of the plant will be handled by NamWater, they should stipulate in the contract that the O&M Operator is required to employ local labour for all unskilled and semi-skilled positions and or train local staff to fulfil semi-skilled positions. These positions should take specific measures to ensure adequate gender equality as per the EGP.

The O&M Operator should also be required to undertake a skills development programme, where unskilled and semi-skilled workers are trained to undertake basic plant operations, which could make staff employable in other water and waste treatment facilities at the project at the end of its life cycle. NamWater in association with the O&M Operator should identify required skills sets and develop a skills development programme whilst incorporating gender equality. In the event of a succession in the O&M Contractor, NamWater, through its tendering and contracts process, should institute measures to protect the employment opportunities of local staff associated with such succession.

In addition, the O&M contract should also include targets pertaining to local procurement in accordance with NamWater's procurement policies, which should give preference to local service providers.

3.5 SITE ACCESS AND SECURITY

The desalination pilot plant possesses a health and safety risk to the uninitiated, since much of the equipment is automated, turning on and off without warning and the various potentially harmful chemicals stored on the site. The plant also represents a significant financial investment and an important asset to NamWater. The plant's proximity to local community areas is also such that the public may be enticed to enter the site out of interest. For these reasons it is essential that security and access control measures are implemented throughout the project lifespan.

An access control system shall be developed to ensure that no unauthorised personnel can gain access to pilot plant. A windscreen sticker should be provided to all permanent staff, authorised service providers, and officials needing access from time to time. All other visitors are required to report to the site offices on entering the plant and must be escorted around the facility.

All buildings, when not actively occupied, should be closed and locked. All vehicular and pedestrian gates should also be kept locked at all times. "No Unauthorised Entry" warning signage should be posted at entrances, warning of the potential danger and providing relevant contact numbers of key operational staff in the event that outsiders need entry for whatever reason.

A security presence shall be maintained on the site permanently, including during shutdown or mothballing periods. All security incidents shall be immediately reported to NamWater within 24 hours of occurring. Security personnel should be sourced from a reputable company and random checks should be conducted to ensure that personnel are at their stations and alert.
The O&M Operator shall ensure that the premises are not used for any activity not directly associated with the operation or maintenance of the plant.

3.6 FACILITY MANAGEMENT AND OPERATIONS

NamWater shall ensure that sufficient budget allocations and provisions are made available to ensure that the infrastructure can be adequately operated and maintained. NamWater must also attend to any damages of the Plant resulting in any potential pollution and leakages of the brine, as a matter of high priority.

3.7 ROUTINE MAINTENANCE AND REPAIRS

The condition of the infrastructure shall be inspected routinely and a maintenance list compiled. Identified, preventative maintenance issues shall be undertaken as soon as possible. Any wastes or pollution arising from the repair and maintenance work must be rectified as soon as possible.

3.8 ENVIRONMENTAL & SOCIAL AWARENESS

Instilling a sense of environmental and social awareness and consideration in all employees, but especially those involved with the project is vital to the overall success of any ESMP. It is therefore recommended that a general environmental and social awareness course for all new operational staff and employees of maintenance Contractors, who may be required to carry out duties on the project, be undertaken on their appointment. It is recommended that the regional council / local village council create a “green rules” pamphlet for dissemination to all workers and Contractors working on all council projects and sites.

3.9 WASTE AND POLLUTION MANAGEMENT

3.9.1 Hazardous materials

Where hazardous materials are required for repair and maintenance work (including fuels and oils), care shall be taken to ensure that a competent individual is appointed to enforce the responsible use of such materials. The operational staff or maintenance teams shall carry a copy of the relevant MSDS whenever using such materials. NamWater shall ensure that persons working with hazardous materials have been trained in the handling of such substances, as well as in emergency procedures to be followed in the event of an accidental spillage or medical emergency. Maintenance teams shall also carry a spill kit containing the appropriate neutralizing chemicals, absorbent materials and other relevant equipment required to undertake a clean-up of any spill that may occur.

3.9.2 Noise and Odour management

During maintenance operations, all silencing mechanisms on all equipment must be in a good state of repair. Except for in emergency situations, no amplified sound may be broadcast. All routine maintenance shall be restricted to daylight hours.

I addition all odour control mechanisms must be in good working condition. If any odours is of a nuisance to surrounding areas / neighbours it must be immediately rectified and properly controlled.

3.10 SUMMARY OF OPERATIONAL PHASE / POST-CONSTRUCTION MANAGEMENT ACTIONS

Table 8: Operational Phase Management Table

Aspect	Management Objective	Management actions	Responsibility
Pre-operational	To ensure that proper employment procedures (gender / equity / locals) were carried out. To ensure that the local community were properly consulted before operation starts.	• Appoint qualified management and suitable employees in order to operate and oversee the operations of the Plant on a daily / weekly basis with the carrying out of proper employment procedures (gender / equity / locals) and providing skill transfer where possible. • Educate the local public in the operations of the Plant and the benefits and employment opportunities to be investigated for growth within the local economy.	NIE / NamWater
Reluctance of beneficiaries to use desalinated water	Proper educational awareness needs to take place within the local community.	• Proper educational awareness needs to take place within the local community. • This can be done with schools visiting the Plant / information section at the plant or doing community outreach with the Local Town Councils / other community bodies (churches etc).	NIE / NamWater / MHSS
Responsible management	To ensure that operational activities are carried out sufficiently and adequately.	• Appoint proper qualified management and employees in order to operate and oversee the operations of the Plant on a daily / weekly basis.	NIE / NamWater
Environmental and social awareness	To ensure that all employees, Sub-Contractors as well as the surrounding community are informed of their environmental and social obligations.	• Environmental, Health, and Safety procedures must be properly communicated to the employees (with appropriate safety gear and signage) of the plant as well as local communities in close proximity.	NIE / NamWater
		• The operations manager responsible will provide feedback to his staff on their environmental and social performance and address issues requiring attention and specific actions required.	NIE / NamWater
Safety to the employees and public	To reduce the risks posed by the project to the employees and local public.	• Where the public could be exposed to danger by any of the Plant activities, the Operator shall provide flagmen, barriers, and/or warning signs in English where applicable. • The Operator shall implement appropriate measures to limit any	NIE / NamWater / MHSS

Aspect	Management Objective	Management actions	Responsibility
		adverse social impacts associated with the operations of the plant where applicable.	
Human resource and opportunities management	To ensure that job creation and accommodation of additional workforce within a small community does not result in significant social impacts.	• In order to enhance the benefits of employment creation for these communities, it is recommended that the Operator shall establish a formal and organised recruitment process in line with this EMP.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
	Operational activities shall be restricted to specified hours with proper emergency response teams in place in case of an emergency outside of general office hours.	Operational activities shall be restricted to specified hours with proper emergency response teams in place in case of an emergency outside of general office hours.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
	Local employment and job opportunities. The construction phase of the project will have a positive impact on the local labour market. A positive impact on continued permanent employment will be probable due to the proposed project as the long-term economic viability of the plant will be possible, following the plant expansion. (+)	• Unskilled job opportunities should be afforded to the local communities, as far as possible. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities. • Individuals with the potential to develop their skills should be afforded training opportunities. • Payment should comply with applicable labour legislation in terms of minimum wages. • Where local labourers are employed on a permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation

Aspect	Management Objective	Management actions	Responsibility
		required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' construction phase positions have become redundant or once the construction phase comes to an end.	
	Local economy opportunities and economic empowerment. The operational phase of the project will have positive impacts on the local economy, creating opportunities for formal and informal businesses to benefit from the proposed project. (+)	• The developer to encourage, in consultation with key stakeholders, construction companies to use local services. • As for maximising employment benefits. Also: • Develop register of local SMMEs. • SMME skills development as part of Corporate Social Investment (CSI) programme. • Community education.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
Risk of skill loss – skilled staff leaving NamWater employ during / after Pilot Phase (Sustainability)	To ensure that no skill loss – skilled staff leaving NamWater employed during / after Pilot Phase takes place.	• Local people can be trained part-time during the construction period to attain skills necessary for operation of the plant. • Details of the proposed project should be designed in consultation with community. • NamWater should support or endorse existing development programmes. • Skills transfer should be encouraged by identifying people with the potential • On-site or in-job training should be encouraged • Promote skills development programmes related to alternative economic activities	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
Leakage of brine into soil and groundwater from ponds (poor design, damage of lining during cleaning, flooding during heavy	To ensure no leakages of brine and wastewater into the environment / groundwater.	• Design must include a proper lining to prevent leakage, and adequate capacity for heavy rainfall events. • Competence of operating staff employed at the plant • Develop a proper and up to date Operation and Maintenance (O&M) manual of procedures with technical guidelines • Routine and proper environmental monitoring of all aspects of the plant. • Establish regular reporting procedures on maintenance	NIE / NamWater / MAWF / MHSS

Aspect	Management Objective	Management actions	Responsibility
rain)		• Undertake regular inspection and maintenance of all infrastructure to ensure in working order and to assess damaged/ deficient equipment, as per the Operation and Maintenance Manual • Brine peak flow monitoring by monitoring the incidence of overflow at pump stations leading to the ponds and accurate recording of flow metering. • Monitoring of surrounding boreholes for potential contamination of surrounding sources or from the brine evaporation ponds.	
Improper reuse of the brine / salt-by-product	The reuse of the brine must be properly researched.	• The use of brine (salt) produced during water treatment for agricultural / other uses is encouraged due to the high levels of nutrients inherently contained therein. • Proper research must be done to make sure that the brine / salt-by-product is used in the correct ways. • In addition, such use must be strictly controlled and monitored with restrictions on specific uses to ensure the health and safety of both the producers and the consumers of the products to which the brine / salt-by-product has been applied (DWAF, 2012). • Different options of reuse of the brine must be properly researched. • Test and continues samples need to be taken in order to make sure no harm comes to people or animals that may come n contact or utilise these options further.	NIE / NamWater / MAWF / MHSS
Water quality changes (+)	The project is aimed at improving the quality of water for NW to comply with the new water quality regulations of the Water Resources Management Act of 2013	• Regularly test water to ensure continuous compliance with water quality regulations	NIE / NamWater / MAWF / MHSS
Non-sustainability of water sources	To ensure the ground water resource is not over abstracted.	• Routine and proper monitoring of all aspects of the plant. • Proper monitoring of water being pumped / being used or wasted.	NIE / NamWater / MAWF / Town

Aspect	Management Objective	Management actions	Responsibility
being over used		• Regular checks on all aspects of water usage be reported	Councils
Sustained future operation, management and maintenance of the plants	To ensure the sustained future operation, management and maintenance of the plant.	• Plan the project in such a way to minimise social costs and maximise the benefits discussed.	NIE / NamWater / MAWF / Town Councils
Possible unaffordable water tariff for desalinated water Collapse of the South African Rand (and the N$)	To ensure the water tariff for desalinated water does not become unaffordable to the local community where NamWater wants to help.	• Provide subsidies to most vulnerable people.	NIE / NamWater / Town Councils
Improved health.	The project will provide the local community with better quality water and this will have a positive impact on the health of the people. (+)	• Regularly test water to ensure continuous compliance with water quality regulations.	NIE / NamWater / MAWF / Town Councils / MHSS
Savings on current expenses.	Due to the better-quality water, medical expenses would be less (dentists) and less frequent need to replace water usage equipment (Geysers, kettles etc.). (+)	• Regularly test water to ensure continuous compliance with water quality regulations.	NIE / NamWater
Self-esteem upliftment.	With cleaner teeth comes higher self-esteem, less likelihood of depression and	• Regularly test water to ensure continuous compliance with water quality regulations. • Provide training in basic hygiene.	NIE / NamWater

Aspect	Management Objective	Management actions	Responsibility
	social betterment regarding relationships and even job performance. (+)	• Provide counselling programmes.	
Training and skills transfer.	The project will provide the opportunity for the local community to participate in training and skills transfer activities. (+)	• Promote skills development programmes. • Do a skills audit to attain various skills needed in the local community. • Provide training (accredited and non-accredited) not only for project related skills. E.g. basic business skills, health and safety, computer, hygiene, agriculture, tourism, HR etc. • Identify vulnerable people, youth and women to take part in training and skills transfer programmes.	NIE / NamWater / Ministry of Labour Industrial Relations, and Employment Creation
Noise	To limit noise levels form the plant and wind turbines	• Adequate controls of heavy vehicle traffic during to mitigate negative impacts such as noise and sense of place.	NIE / NamWater
Health hazard to animals and people entering the pond area	Limit adverse health effects from people or animals utilising the wastewater pond areas.	• The Plant and ponds need to be properly fenced to keep animals from entering the site.	NIE / NamWater / Town Council / MHSS
Collision of birds with wind turbines	Install effective bird deterring techniques where possible.	• Assessment and monitoring be done on the effects of the wind turbines on surrounding wildlife, especially birds.	NIE / NamWater
Potential of birds being attracted to the ponds	Install effective bird deterring techniques where possible.	• Assessment and monitoring be done on the effects of the ponds on surrounding wildlife, especially birds.	NIE / NamWater
Fire or explosion of plant	Ensure that proper fire safety equipment are onsite at designated areas.	• Health and safety protocols to be put into place. A method statement is required for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage. • No persons allowed on site other than project employees. • Minimal materials are stored. • All waste disposal bins will be emptied. • Materials are stored in leak-proof, sealable containers or	NIE / NamWater / Town Council / MME

Aspect	Management Objective	Management actions	Responsibility
		packaging. • The store area is secure and locked. • Basic firefighting equipment must be available on site. Fire extinguishers are serviced and accessible. • The area is secure from accidental damage through vehicle collision, etc. • Emergency and contact numbers of the operator / NamWater / NIE are available and prominently displayed. • All stores will be secured. • Chemical toilets are empty, kept hygienically clean and secured. • 24-hour security will be on site during this period. • All trenches are barricaded with danger tape..	
Used equipment such as RO filter disposal	Ensure that RO filters once reaching its lifespan is properly disposed of.	• Proper disposal plan be provided on how to dispose of plant equipment, be it; to sell the equipment to be reused / recycled by a prospected buyer; or the disposal at a licenced landfill site. • A disposal certificate must be obtained and signed off by a licenced waste disposal specialist.	NIE / NamWater
Theft of solar panels and other materials	Try and ensure proper means to deter the theft of solar panels and other operational materials	• Site to be fenced and access should be controlled. Loitering of outsiders at either the construction side or at the construction village should not be allowed. Local security companies and Police should be requested to assist in this regard. • Liaison structures are to be established with local security companies and police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations.	NIE / NamWater / Town Council / Local Police
Visual impact of the plant, solar panels and wind	Visual impact of the plant, solar panels and wind are not significant	• Sensitisation must be done to provide effective mitigation measures where possible	NIE / NamWater
Solid waste management	To ensure that there is no illegal disposal of waste.	• The Operator shall provide sufficient number of rubbish bins with secured lids. • No waste materials, including domestic, organic or operational wastes shall be burnt, dumped or buried on the Site.	NIE / NamWater / Town Council

Aspect	Management Objective	Management actions	Responsibility
Equipment maintenance and storage	All equipment are kept in good working order.	• Leaking or damaged equipment shall be repaired immediately or removed from the Site.	NIE / NamWater
Plant down-time (no water provision)	Minimise and properly handle the down-time (no water provision) of the plant	• Water will be stored in existing / additional reservoirs to have back-up water for a minimum of 48h so that the problem can be fixed within that time frame. • If the problem persists after the 48h, water provision will temporarily switch back to the old water scheme standards.	NIE / NamWater / Town Council
Hazardous substances	Any hazardous substances are stored appropriately.	• Hazardous chemical substances used during operation shall be stored in secondary containers. • The relevant Material Safety Data Sheets (MSDS) shall be available on site.	NIE / NamWater / MHSS
Emergency procedures	All employees are aware of emergency procedures.	• The Operator shall ensure that his employees are aware of the procedure to be followed for dealing with leaks and spills. • The Operator shall ensure that the necessary materials and equipment for dealing with leaks and spills are available on Site at all times.	NIE / NamWater / MHSS

4 DECOMMISSIONING / EQUIPMENT REPLACEMENT

Given the nature and purpose of the infrastructure, it is unlikely that this entire plants infrastructure will be decommissioned in the near future. In order to be sustainable the project would rather deal with continually replacing life-ending equipment than the possibility of decommissioning.

In the unlikely event that the use of the infrastructure is discontinued by NamWater, the infrastructure would be auctioned. Removal of the infrastructure is likely to cause more environmental or social harm than its abandonment.

If, for whatever reason, sections of the Works need to be removed, the materials would either be disposed of at a registered landfill site or it would be recycled depending on the type of material. The best option at the time would be investigated.

5 MONITORING PROGRAM

The monitoring program evaluates the effectiveness of the management and implementation of the mitigation measures associated with the pilot desalination project. The program focus on the mitigation measures mentioned in Table 6&7 and it is also complementary to the mitigation measures under the Construction and Operational Phases. The Monitoring Program as presented in has the following sections:

- Public Awareness and Community Perceptions
- Disruptions of Public Utilities and Services
- Traffic Concerns
- Access to Homes and Public Places
- Air Emissions and Air Quality
- Noise Generation
- Handling and Storage of Construction Materials and Wastes
- Hazardous Materials Use and Storage of fuels and Hazardous Materials
- Worker and Public Safety
- Water Quality
- Construction of Treatment Plants and elevated Storage Tanks
- Generation and disposal of TP sludge/wastes
- Storage of Chemicals

Public awareness and community perceptions
Monitoring under this section seeks to confirm that the public awareness and consultations mitigation measures were implemented or held. The monitoring responsibility lies with the NamWater Program Management Team. The monitoring frequency is generally once at the initial stages of the construction and operation and at the end of construction and operation. This will also continue when the plants are handed over to NamWater at once per year frequency.

Disruptions of utilities services
Monitoring is scheduled to be executed mainly by the Construction Supervision Team utilizing onsite inspections and scheduled audits. The monitoring is continuous on a generally monthly cycle.

Traffic concerns
Monitoring focuses mainly on the development and implementation of the Traffic Management Plan. Monitoring or oversight is provided by the Contractor ECO. Indicators are evidence of the completion or implementation of the various tasks and systems. Monitoring is continuous with daily and weekly inspections and monthly audits.

Access to homes and public places
The Construction Supervision staff is responsible for the monitoring. The indicators are implementations of plans, occurrence of consultations and erections of safety barriers.

Air Emissions and Air Quality
Daily inspections are to confirm the use of PPE, dust suppression methods and related tasks. The monitoring will be conducted by the Contractor ECO with daily inspections.

Noise Generation
Monitoring will be conducted by Contractor ECO with daily inspections and monthly audits. The indicators include use of PPE, maintenance of equipment and machinery and limiting of work hours, as needed.

Handling and Storage of Construction Materials and Wastes
The Contractor ECO will conduct the monitoring with a cycle of daily inspections, and monthly audits. The indicators include approvals for placement of wastes, confirmation of the construction of retaining berms and other structures.

Hazardous Materials Use and Storage of fuels and Hazardous Materials
The indicators to be monitored include the installation of secondary containment, approved H&S and Emergency Response Plans, and record of induction training of construction staff in waste handling. The Monitoring is to be conducted by Contractor ECO on weekly inspections, monthly audits and preconstruction reviews.

Worker and Public Safety
The Contractor ECO will monitor the following, training and induction records, use of PPE, caution signage, erection of barriers and access control, signage and the application of H&S procedures.

Water Quality
The indicators for the improvement in water quality will be the changes in total dissolve solid/conductivity, etc to comply with the new water quality standard. NamWater engineers or scientist who will be stationed on the proposed sites will be conducting daily monitoring of the conductivity, temperature, and pH of the water from the RO plants before and after blending. Monthly water samples for full chemical and bacteriological or microbiological will be collected and submitted or send to the NamWater laboratories for analysis.

Water quantity
The NamWater Engineers/Scientist together with the plant operators will be taking weekly monitoring of the production of the boreholes.

Construction of Treatment Plants
The NamWater Chemical Engineers/Environmental Scientist will review the H&S induction and training records, daily inspection reports and other evidence that the H&S Plan is being followed .on a monthly cycle.

Generation and disposal of TP sludge/wastes
The NamWater Chemical Engineers/Environmental Scientist will monitor this aspect focusing on the following indicators of compliance: Induction of contractor workers/staff and subcontractors on handling of sludge, O&M procedures for sludge handling and Pilot Test/Investigation on the disposal of sludge.

Storage of Chemicals
The NamWater chemical engineers/environmental scientist will conduct a monthly review/inspection of this aspect. The indicator of compliance includes MSDS for all chemicals, functional storage containers and chemical usage and inventory records.

Renewable energy plants construction
The NamWater Electrical Engineers will review the design of the plants to ensure that the plants are confirming to the NamWater standard. This will be done once at the pre-construction phase.

Energy from the renewable plants

The NamWater Engineers/Scientist will monitor the electricity generation from the plants on daily basis during the operational phase. Parameters such as the amount of electricity produced by the solar and wind plants. Environmental parameters disturbing the plants from generating electricity such as changes in wind speed and wind direction and changes in sunlight intensity and occurrence of cloud covers will be recorded on site on daily basis.

Changes in health due to desalinated water

The NamWater Engineers/Scientist will conduct surveys after every six months to determine the changes in health of the people previous affected by bad water quality. A baseline survey will be conducted during the pre-construction phase.

6 PUBLIC CONSULTATION/COMMUNICATION

The goals of the Public Consultation/Communication Program are:

- To provide ongoing information on to the affected community and public on the implementation of the proposed mitigation measures.
- Facilitate open and continuous communication and consultation between the various groups including, NamWater, Contractor, Local Authorities, the Stakeholders, impacted community, and the public.
- Providing timely and appropriate information prior to and during construction to enable informed participation in the NamWater program as it suits their interests.
- To encourage participation in the consultation process groups that do not normally participate but who could potentially be impacted by the project and who can both benefit from participation and contribute to it's the overall success.

There will be formal, scheduled consultations and meetings. In addition specific information will be provided on an ad hoc basis to address significant changes in schedule or other important developments.

Two critical aspects in the implementation of the Public Consultation/Communication Program are:

- A Program Public Relations Coordinator who will be responsible for the coordination of communication and consultation with interested Stakeholders and the general public.
- A Grievance Procedure to allow the Stakeholders a formal mechanism to register complaints, grievance and concerns on the implementation of the NamWater.

Stakeholders

Stakeholder Groups will be established in each project areas. The Stakeholders will be representatives from the various civic groups and organizations, religious and business entities, along with the Local Government Administrations, Police and Traffic Department. The NamWater Management, the Supervision and Construction Contractors will also participate in the group.

A date base of participants and stakeholders will be developed and maintained. The groups will be formally invited to participate in the process, and consultations. The date-base and contact lists shall be distributed to all Stakeholders. Each group will select an organization to formally chair and coordinate the Stakeholder activities.

Consultations

The Consultations are designed to provide information and solicit community input on various aspects of the project. There will be formal consultations to address the programmatic issues and impacts established in the Pilot Desalination ESA. The scheduled consultations are listed in Table 9, scheduled Consultations for project area.

The NamWater scientist together with the public relation department will coordinate the consultations for each project areas.

Table 9: Consultations

Consultation	Purpose	Participants	Lead/Chair	Schedules
Initial	▪ Project Start up: ▪ Project Overview ▪ Project Organization ▪ Project Schedule ▪ Social and Env Impacts	Stakeholder group Contractors Schools leaners NamWater project management team ECO Local authorities representatives	NamWater project management team	10-35 days before Schedule Start of Construction
Cost Recovery	Consultation on: Community "ownership" and stewardship of water system Need for cost recovery and justification of water rates; Include information of NRW program	Stakeholder group, NamWater project management team	NamWater project management team	Within 25 days after Start of Construction
Project Plans & Procedures	Consultation on: Access to Businesses and homes H&S Plan Waste Management Plan Traffic Management	Stakeholder group, NamWater project management team, and construction team	NamWater project management team	Within 55 days after start of the Construction
Addressing Community Concerns	Consultation on Grievance Procedure	Stakeholder group, NamWater project management team, and construction team	NamWater project management team	Within 75 days from start of construction.

Meetings

For this project, there will be scheduled and ad Hoc meetings

Scheduled Meetings

Stakeholder Meetings shall be held monthly at a designated location in each of the project area. The Agenda will include but not limited to the following items:

- Project Status Overview
- Project Schedule Updates
- Mitigation Measures
- Public Consultations and Meetings
- Non-Conformances and Corrective Actions
- Public Concerns

- Other Matters

The Stakeholder Meeting will be coordinated and chaired by the Stakeholder selected by the Stakeholder Group. Notices for Stakeholder Meetings should be received ten working days ahead the meeting; notices may be sent to Stakeholders through the electronic media and announced through newspapers, Local TV news and flyers.

Ad Hoc Meetings

Ad Hoc or unscheduled meetings maybe called to address significant changes in project schedules, community concerns or major environmental issues. Any three members of the Stakeholder Group with at least 3 days' notice may request meetings

Public Awareness Campaigns

The primary goals of the Public Awareness Campaign is to provide information on specific aspects of the Pilot Desalination Project to the general public, leaners and women, to increase public awareness of the program with the aim of promoting community ownership and participation in its implementation.

7 CONCLUSION

In conclusion, it should be noted that this ESMP should be regarded as a living document and changes should be made to the ESMP as required by project evolution while retaining the underlying principles and objectives on which the document is based.

The Environmental and Social Specialists are thus of the opinion that this ESMP would be sufficient for the proposed Pilot Desalination Plant.

APPENDIX A:
Grievance Mechanism

APPENDIX B:

Generic Method Statement Example

INFORMATION ON METHOD STATEMENTS

Method Statements are to be completed by the person undertaking the work (i.e. the Contractor). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed and potentially significant environmental aspects mitigated at the planning stage.

The Method Statement can only be implemented once approved by the ECO.

The Contractor (and, where relevant, any Sub-Contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The ECO will use the Method Statement to audit compliance by the Contractor with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the ECO, denoting that the changed methodology or works are necessary for the successful completion of the works, and are environmentally acceptable. The Contractor will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement.

This Method Statement MUST contain sufficient information and detail to enable the ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works. A method statement should clearly answer to following:

- What does the activity entail;
- Why is the activity required;
- When will it commence and how long;
- Where will the activity be undertaken;
- How will the activity be undertaken
  - What equipment and machinery will be required;
  - What materials (Chemicals) will be used in the process;
- What are the potential environmental, health and safety concerns associated with this activity and what mitigation measures will be employed to manage these risks.

The time taken to provide a thorough, detailed method statement is time well spent. Insufficient detail will result in delays to the works while the method statement is rewritten to ECO's satisfaction. The page overleaf provides a pro forma method statement sheet, which needs to be completed for each activity requiring a method statement in terms of the LEMP.

EXAMPLE OF METHOD STATEMENT

CONTRACT: ……..……... DATE: ……..

PROPOSED ACTIVITY (give title of Method Statement and reference number):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:	**End Date:**

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible): Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

_____ _____

_____ _____

(Signed) ***(Print name)***

_____ _____

(Signed) ***(Print name)***

Date: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement:

_____ _____

_____ _____

(Signed) ***(Print name)***

Date: _____

3) ENGINEER

The works described in this Method Statement are approved:

_____ _____

_____ _____

(Signed) ***(Print name)***

Date: _____

4) APPROVING AUTHORITY

The works described in this Method Statement are approved:

_____ _____

_____ _____

(Signed) ***(Print name)***

Date: _____

Annexure 8: Grievance mechanisms

Namibia Pilot Desalination Project

Grievance Mechanism

NamWater

Reference: 113771

Revision: v2

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aurecon

Bringing ideas to life

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Abbreviations

ACHM	Ad Hoc Complaint Handling Mechanism
BID	Background Information Documents
CBO	Community Based Organisation
CDC	Community Development Committee
CEO	Chief Executive Officer
CMHC	Counselling and Mental Health Centre
DRFN	Desert Research Foundation of Namibia
EE	Executing entity
ESIA	Environmental, social, and gender assessment
ESMP	Environmental and social management plans
ESMS	Environmental and Social Management System
HIV/ AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HR	Human resources
IFC	International Finance Corporation
IPPR	Institute for Public Policy Research
NamWater	Namibia Water Corporation Ltd
NCPE	National Commission for the Promotion of Equality
NIE	National implementing entity
NGO	Non-governmental organisation
PFG	Project Formulation Grant
PS	Performance standard
STI's	Sexually transmitted diseases
TB	Tuberculosis
UNDP	United Nations Development Programme

1 Provisions for redress of grievances

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities.

The Adaptation Fund (Fund) makes the ACHM available to Implementing Entities and members of the communities that are adversely affected by the implementation of project / programmes funded by the Fund. The purpose of the ACHM is to assist in responding to complaints raised against project / programmes funded by the Fund through a participatory approach.

Complainants and implementing entities should use the implementing entity's grievance mechanism as a first step. However, the ACHM can be used in cases where the Parties have failed to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year. The ACHM requires a written submission of a complaint by at least one of the Parties.

The Adaptation Fund Board secretariat (secretariat) will independently manage all aspects related to complaint handling, under the oversight of the Ethics and Finance Committee (EFC) of the Adaptation Fund Board (Board).

The ACHM builds on alternative dispute resolution techniques. Main features of the ACHM are to effectively facilitate dialogue among stakeholders, mediate/assist in resolving issues raised, and develop and share lessons to improve future operations

Adaptation Fund
Ad Hoc Complaint Handling Mechanism (ACHM)

Grievance mechanisms are an important part of IFC's approach to requirements related to community engagement by clients under the Policy and Performance Standards on Social and Environmental Sustainability. Where it is anticipated that a new project or existing company operations will involve ongoing risk and adverse impacts on surrounding communities, the client will be required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the client's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies. The client will inform the affected communities about the mechanism in the course of its community engagement process (PS 1, Paragraph 23).

A grievance mechanism should be able to deal with most of the community issues that are covered by IFC's Performance Standards. Grievance mechanism requirements in relation to affected communities are explicitly stated with regard to security personnel (PS 4, Paragraph 13), land acquisition (PS 5, Paragraph 10), and adverse impacts on indigenous peoples (PS 7, Paragraph 9). The contractor will be asked to design the mechanism according to the extent of risks and adverse impacts of the project. Impacts on communities are evaluated within the Social and Environmental Assessment for a project.

Grievance mechanisms inform and complement but do not replace other forms of stakeholder engagement. Stakeholder engagement also includes stakeholder identification and analysis, information disclosure, stakeholder consultation, negotiations and partnerships, stakeholder involvement in project monitoring, and reporting to stakeholders. If strategically applied throughout the project life, an integrated range of stakeholder-engagement approaches can help build trust, contribute to maintaining broad community support for the project, and ultimately help companies promote the long-term viability of their investments.

1.1 What is grievance

The Good Practice Note[1] defines a grievance as a concern or complaint raised by an individual or a group within communities affected by project construction and company operations. Both concerns and complaints can result from either real or perceived impacts, and may be filed in the same manner and handled with the same procedure. The difference between responses to a concern or to a complaint may be in the specific approaches and the amount of time needed to resolve it. The term "grievance" implies that there may be a problem. In practice, however, the nature of feedback that communities may want to bring to a contractor's attention will vary, since communities often find it appropriate to use the same channels to communicate not only grievances but also questions, requests for information, and suggestions. Communities may even use these channels to convey what they think the company/contractor is doing well.

The client should keep in mind that unanswered questions or ignored requests for information have the potential to become problems and should, therefore, be addressed promptly. It is good practice to respond to community feedback through the relevant pillars of community engagement, such as disclosure, consultation, and participation in project monitoring. For example, a question about specific benefits the project provides or intends to provide to women in the community can be forwarded to a community liaison or a staff member who specifically deals with gender matters, if such person has been appointed by the project. The person(s) who asked this question are then notified as to who will respond and by when.

1.2 Project-level grievance mechanism

A project-level grievance mechanism for affected communities is a process for receiving, evaluating, and addressing project-related grievances from affected communities at the level of the company, or project. In the context of this projects, this mechanism may also address grievances against contractors and subcontractors. Project-level grievance mechanisms offer companies/contractors and affected communities an alternative to external dispute resolution processes (legal or administrative systems or other public or civic mechanisms). These grievance mechanisms differ from other forms of dispute resolution in that they offer the advantage of a locally based, simplified, and mutually beneficial way to settle issues within the framework of the contractor–

[1] IFC Good Practice Note: Addressing Grievance from Project Affected Communities. 2009. Available from available at http://www.ifc.org/ifcext/sustainability.nsf/Content/Publications_GoodPractice. Accessed on 19th August 2014.

community relationship, while recognising the right of complainants to take their grievances to a formal dispute body or other external dispute-resolution mechanisms.

It should be noted, however, that complex issues that arise from high environmental and social impacts are seldom resolved in a relatively simple way. In such cases, projects should anticipate involvement of various third parties in the resolution process to achieve solutions with affected communities. These include, but are not limited to, various national and international mediation bodies, independent mediators and facilitators with sector- and country-specific expertise, and independent accountability mechanisms of public sector financiers.

> ***Keep your grievance mechanism operational.***
> *Once the construction period is over, the project is likely to experience a decrease in the number of complaints. This may be because the issues previously raised have now been resolved, or because the "moment of maximum impact'" has passed. While this might mean that a company can scale down the level of resources it was devoting to the day-to-day management of grievances, there should always be a well-functioning procedure for receiving and addressing public concerns whenever they may arise throughout the life of the project.*
> ***IFC***

2 Approach to grievance redress

2.1 Local community grievance procedure structure

The grievance procedure currently utilised by the Bethanie, Grünau and Epukiro communities are that the grievances go through the Local Village Council and the Community Development Committee (CDC). The CDC is made up of representatives from:

- The Local Council;
- Churches;
- Schools;
- NamWater;
- NamPower;
- Elders;
- Youth; and
- Business owners.

The CDC is not as active as it could be and it is recommended that this committee be revived and revised to be able to be the contact point between the project and the local community, and handle all grievances. The community indicated that this is the way they would prefer grievances to be handled. They also stipulated that dates must be set for CDC meetings so that continuous communication between the project and the community can be a reality.

2.2 National implementing entity (NIE) - DRFN

DRFN as part of structured / periodic monitoring would take-up the scrutiny of books of accounts as well as scrutiny of audit and accounting systems of the project fund at executing entity level. Release of fund would be based on the scrutiny of accounts and utilization of funds, progress of implementation and action plan submitted by the EE.

Risk parameters identified would be specifically monitored during the field visits as well through reporting mechanism by NamWater to DRFN. Monitoring objectives will also include identification of project bottlenecks and risks as early as possible to address them.

DRFN has a Regional Office at the state capital, Windhoek. DRFN has trained manpower at Regional Office level for implementation of AF projects. DRFN officials/teams at local and regional level would be involved in project guidance, steering, monitoring, auditing, co-ordination with local and regional officials for resolving any bottlenecks in project implementation.

The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities. Please see the Ad Hoc Complaint Handling Mechanism (ACHM) as approved in October 2016 in Appendix A.

2.3 Executing entity (EE) - NamWater

NamWater as the Executing Entity will be responsible for execution of the project as per the approved proposal at the field level ensuring social inclusion including participation of vulnerable groups and women, gender mainstreaming, partnership with local agencies including district level government departments, local self-government, NGOs and CBOs and local communities, their livelihoods and the ecological security of the Area.

NamWater will also undertake key administrative and operational functions, including:

- Development of annual work plans in consultation with the DRFN and implementing partners;
- Financial management (sending out fund requests and receipt of funds from NIE and disbursement to implementing partners)
- Management, supervision, monitoring and evaluation of project activities in close coordination of the implementing partners;
- Reporting to the NIE (e.g., preparation of periodic technical and audited financial reports and annual implementation reports; half yearly ESI and ESMP compliance and impact monitoring report)
- Assigning external consultants wherever necessary to undertake planned project activities/ assessments.
- Ensuring compliance with NIE procedures for governance and program implementation.
- Provide training and skills transfer to local community, in various sectors to stimulate development.
- Employ local community members, especially vulnerable and marginalised groups.

All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation. Please see the NamWater Grievance Handling in Appendix B.

2.4 Grievance mechanisms needed for projects implemented

Although a company generally differentiates between the actions of its own employees and those of contractors and subcontractors, local communities tend to see no difference and will attribute actions of contractors and subcontractors to the company. This is the case even if contractors are in the country only for a short period of time.

Companies need to anticipate grievances that may arise from the actions of suppliers or contractors, and implement a policy and management tools, such as regular monitoring to govern their behavior and actions, including provisions for coordinated management of grievances and key indicators that help evaluate the effectiveness of contractors' policies and tools. Where there are a small number of contractors, it may be feasible for the contractors to establish and manage their own grievance mechanisms. Companies will need to make sure that these mechanisms do not conflict with the company mechanism or those of the other contractors by establishing clear guidelines and ensuring oversight. Where contractual relationships are more complex or numerous, companies may wish to have all grievances directed to the company's mechanism, regardless of whether they relate to the company or its contractors or subcontractors.

Handling grievances encompasses a step-by-step process as well as assigned responsibilities for their proper completion. Figure 1 below provides **procedure on how grievance** should be received, registered and tracked. Contractors establishing grievance mechanisms will follow the process steps discussed in this section.

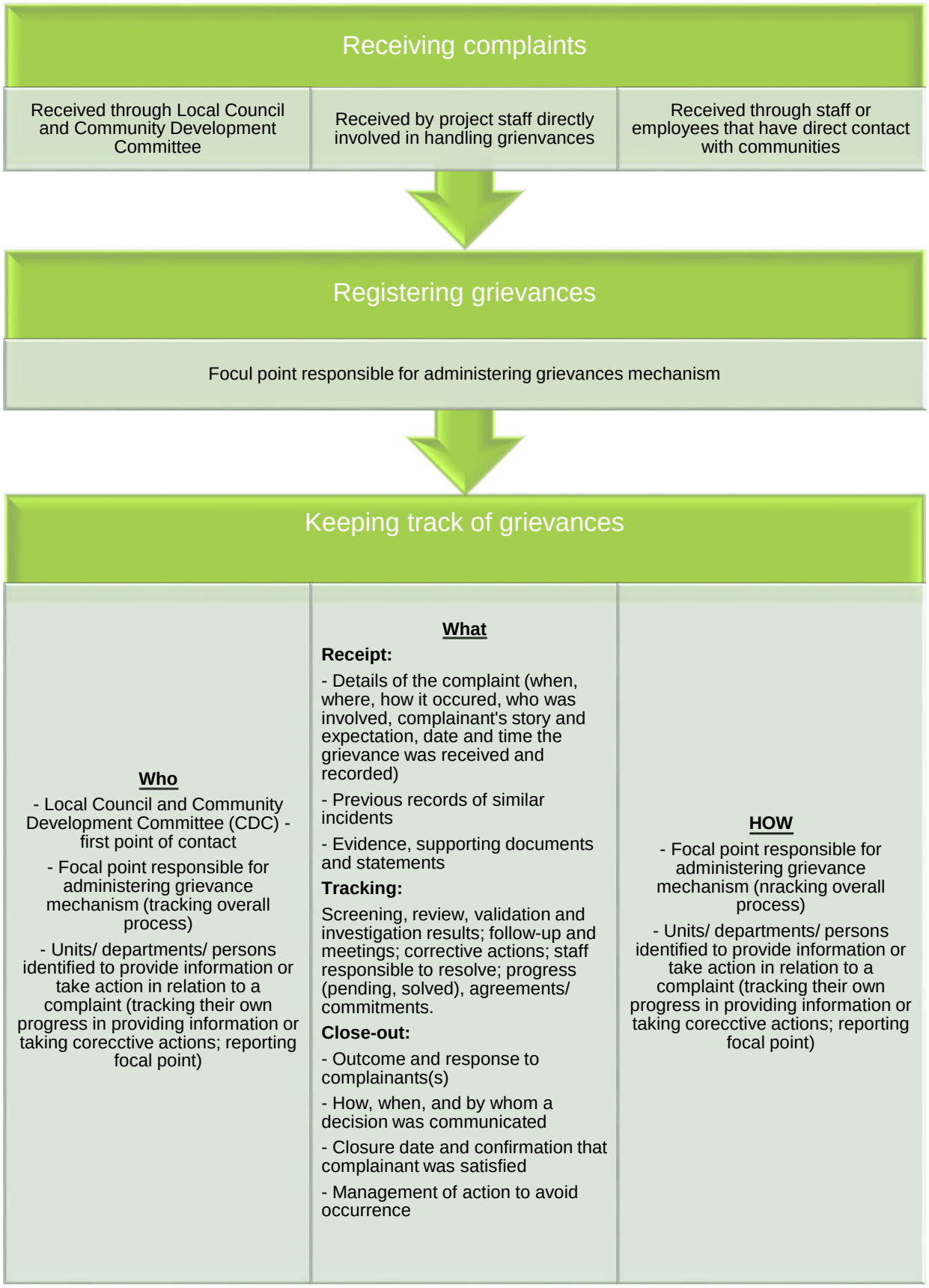

Figure 1: Receipt, registration and tracking of grievances

2.5 Step 1: Publicising grievance management procedures

When and how the grievance mechanism is introduced to affected communities can have significant implications for its effectiveness over time. Guiding principles for publicising a grievance mechanism should be in line with cultural characteristics and accessibility factors of affected communities. The information should include at least the following:

- What project-level mechanisms are (and are not) capable of delivering and what benefits complainants can receive from using the contractor's grievance mechanism, as opposed to other resolution mechanisms;
- Who can raise complaints (affected communities)
- Where, when, and how community members can file complaints;
- Who is responsible for receiving and responding to complaints, and any external parties that can take complaints from communities;
- What sort of response complainants can expect from the contractor, including timing of response; and
- What other rights and protection are guaranteed. Ideally, as part of their first interactions with company representatives, communities should be informed of a contractor's intention to establish a grievance mechanism, and continue to be reminded of this mechanism on a regular basis during project implementation. Contractors should emphasize the objectives of the grievance system and the issues it is designed to address. A contractor's community liaison officers, grievance officers, or individuals working in analogous positions, should be responsible for publicising the procedure through appropriate methods.

2.6 Step 2: Receiving and keeping track of grievances

Once communities are aware of the mechanism and access it to raise grievances, the contractor needs to process them. Processing includes:

- Collecting grievances;
- Recording grievances as they come in;
- Registering them in a central place; and
- Tracking them throughout the processing cycle to reflect their status and important details.

2.6.1 Receiving concerns and complaints

Below are simple rules that any receipt procedure for grievances should follow:

- All incoming grievances should be acknowledged as soon as possible. A formal confirmation with a complaint number, or other identifier, and a timeline for response assures the complainant that the organisation is responding properly, and it gives the project a record of the allegation. If a complaint is received in person, a good practice is to acknowledge it on the spot.

- If a more complex investigation is required, the complainant should receive an update explaining the actions required to resolve the complaint, and the likely timeline.
- The contractor should explain up front what claims clearly are outside the scope of the mechanism and what alternative avenues communities can use to address these potential issues.

2.6.2 Step 3: Reviewing and investigating grievances

For a grievance mechanism to work, all complaints should be handled as promptly as possible, depending on the nature and complexity of the matter. The central unit or person responsible for grievance handling should organise the process to validate the complaint's legitimacy and arrange for investigation of details. Depending on the circumstances of the complaint, various units or departments may need to get involved, including senior management if their direction and decision is required by the established procedures and division of responsibilities. To begin this process, establish the nature of the grievance to determine the measures needed for review and investigation. All grievances will need to undergo some degree of review and investigation, depending on the type of grievance and clarity of circumstances. For example: Minor, straightforward issues may only need screening before proceeding to the next step (resolution options and response). Review of minor issues, especially those related to a complainant's request for information, can generally be handled easily by providing information on the spot, or referring the person to community liaison personnel. If there is any possibility that deeper underlying issues may exist, always take time to look into the complaint further.

Less clear, more problematic, or repetitive issues, or group complaints may need a more detailed review prior to action. Staff involved in handling grievances may need to seek advice internally, and in some cases turn to outside parties to help in the validation process, especially in cases of damage claims. One option to help determine legitimacy is an internal committee comprising staff who will be involved in the operation, staff involved in supervision of the grievance mechanism, and managers from the project departments whose activities are likely to result in claims. For example, the committee might consist a community liaison officer and an operations manager. This committee can also provide initial recommendations on resolution options.

2.6.3 Where an extensive investigation is required

An extensive investigation may be required when grievances are complex or widespread and cannot be resolved quickly. As a way to conform to the principle of "no cost to communities," the contractor should take full responsibility for investigating the details of grievances coming through its grievance mechanism. However, in cases of sensitive grievances such as those involving multiple interests and a large number of affected people, it may help to engage outside organisations in a joint investigation, or allow for participation by Community Development Committee, civil society organizations or NGOs, or local authorities, if the complainants agree to this approach.

For controversial projects, consider establishing an independent monitoring panel.
In some cases, where a project is particularly complex or controversial for instance, an independent monitoring panel may be useful for maximum objectivity and transparency. This panel, which might include stakeholder representatives, internationally recognized experts, and eminent persons, can oversee and report on the project's environmental and social performance.
IFC

2.6.4 Step 4: Developing resolution options and preparing a response

Once the grievance is well understood, resolution options can be developed taking into consideration community preferences, project policy, past experience, current issues, and potential outcomes. The following approach is proposed:

- A risk-based assessment of potential grievances disputes or conflicts that may arise during project preparation and implementation;
- Identification of the client's existing capacity for grievance redress; and
- An action plan that identifies priority areas for strengthening grievance capacity, or if necessary, establishing new mechanisms at the project level. Where applicable, dedicated resources should be allocated for realisation of the action plan.

Developing resolutions options commensurate with the nature of the grievance

General approaches to grievance resolution may include proposing a solution:

- Unilaterally (the contractor proposes a solution);
- Bilaterally (the contractor and the complainant reach a resolution through discussion or negotiation);
- Through a third party (either informally or formally through mediation); or
- Through traditional and customary practices.

One of the potential advantages of a grievance mechanism is its flexibility. Rather than prescribe a specific procedure for each particular type of complaint, it may be helpful to establish a "menu" of possible options appropriate for different types of grievances, so that contractor personnel and community members have models for action when a dispute arises. Options include altering or halting harmful activities or restricting their timing and scope, providing monetary compensation, providing an apology, replacing lost property, revising community engagement strategy, and renegotiating existing commitments.

Preparing and communicating clear response

Regardless of the outcome, a response should be provided to all complainants. Responses can be either oral or written, depending on whether the grievance was received orally or in writing. At the time of first interaction between the contractor representative and complainant(s), there are two possible scenarios:

The claim is rejected and no further action will be taken. If a claim is rejected upfront, it is either ineligible or clearly does not have a basis. If the response is that the grievance does not require action by the contractor to resolve it, all considerations should be documented and included in both the response and the contractor systems for grievance tracking for further reference. Contractors should be diplomatic when telling community members that no further action will be taken, since they are likely to be disappointed. But including a detailed and respectful explanation, together with compelling evidence of why it cannot be accepted, usually keeps a conflict from escalating. The claim is accepted. The response procedure would include two general steps:

1. A preliminary response should be provided within a stipulated period of time and should propose the next steps and actions to be taken for resolution. Let complainants know the results of the assessment and the status of their claims, and encourage and invite further discussion with complainants (to obtain additional arguments, collect more evidence, conduct further investigation, and launch a dialogue). If complainants are not likely to be satisfied with the outcome the contractor is considering, schedule group or individual meetings, as needed, to discuss the findings and further clarify the position of the contractor and of the complainants; and, in more complex cases, have management participate in such meetings, since they are perceived to be the legitimate decision makers.

2. A final response should be given to document the final proposed resolution. Communicate the proposal, stipulate mutual commitments, and ask for the complainants' agreement. If the complainants are not satisfied with the proposed resolution, or the outcome of the agreed corrective actions, they should be free to take their grievances to a dispute resolution mechanism outside of the contractor grievance mechanism.

Close out cases only when an agreement with complainants is reached

Following completion of the agreed-upon corrective actions, it is a good practice to collect proof that those actions have taken place. For example:

- Take photos or collect other documentary evidence to form a comprehensive record of the grievance and how it was resolved;
- Create a record of resolution internally, with the date and time it took place, and have responsible staff sign off;
- Have a meeting with the complainants to get a collective agreement to close out the claim; and
- If the issue was resolved to the satisfaction of the complainants, get a confirmation and file it along with the case documentation.

2.6.5 Step 5: Monitoring, reporting, and evaluating a grievance mechanism

Monitoring and reporting can be tools for measuring the effectiveness of the grievance mechanism and the efficient use of resources, and for determining broad trends and recurring problems so they can be resolved proactively before they become points of contention. Monitoring helps identify common or recurrent claims that may require structural solutions or a policy change, and it enables the contractor to capture any lessons learned in addressing grievances. Monitoring and reporting also create a base level of information that can be used by the contractor to report back to communities. Although internal monitoring is usually sufficient for smaller projects, in the case of projects with significant impacts, or where the facts surrounding the grievance are contentious, monitoring by a neutral third party can enhance the credibility of the grievance mechanism.

Tracking grievance statistics to ascertain effectiveness

Depending on the extent of project impacts and the volume of grievances, monitoring measures can be as simple as tracking the number of grievances received and resolved, or as complex as involving independent third-party evaluations. Apart from reviewing each grievance and analysing effectiveness and efficiency, companies also can use complaints to analyse systemic deficiencies. Grievance records should provide the background information for regular monitoring, both informal and formal. Therefore, even a simple tracking system should provide an opportunity to aggregate information and recognise patterns in the grievances the contractor receives, and how they are being resolved.

Adapting the mechanism to correct effectiveness

The final objective of monitoring is to ensure that the design and implementation of the grievance mechanism adequately respond to the stakeholders' needs in a cost-effective manner.

To maintain the mechanism's effectiveness, the contractor must design the mechanism and assign responsibilities to allow for policies and practices to improve efficiencies in the receipt and resolution of grievances. These objectives can be met only through ongoing adjustments to the mechanism, facilitated by support from the management. For example:

- If communities strongly prefer one of several channels offered to submit grievances, focus contractor resources on that channel to lower the costs of methods that communities do not use;
- If only one subgroup in the community raises complaints (for example, women, elderly), determine whether this phenomenon is the result of a particularly high impact of operations on that specific group or an accessibility issue;
- If a large number of grievances do not get resolved through the mechanism, a major change may be required in how the contractor approaches resolution, rather than focusing efforts on resolving individual issues; and

- If the grievances allege that the mechanism lacks transparency, adjust the policy and methods used to publicise it, put more emphasis on inviting the community to participate in decision making through the grievance mechanism, and consider involving third parties.

Using monitoring results to report back

Lessons learned throughout the process of handling grievances can help ensure continual improvement of the contractor's operations. The contractor can also use monitoring to report back to the community on its implementation of the mechanism. In addition, the contractor can designate personnel responsible for translating lessons learned from its monitoring into concrete policy and practice changes for the contractor. A community meeting to explain the results of such reports is also effective, and may lead to a mutually respectful relationship between the contractor and the community.

3 Resources needed to manage a grievance mechanism

3.1 Resources for grievance mechanisms

Grievance mechanisms will be effective if adequate resources; people, systems and processes, and associated financial resources are assigned to implementation, and if responsibilities are clearly defined. Grievance management should be recognised as a business function with clearly defined objectives, assigned responsibilities, timelines, budget, senior management oversight, and regular reporting. For these reasons, grievance mechanisms should be placed within a larger context of a social and environmental management system and should serve as one of the indicators of whether the system is functioning properly. The ultimate responsibility for designing, implementing, and monitoring project-level grievance mechanisms should lie with senior management.

3.2 Who should be responsible for implementation?

For a grievance mechanism to function effectively, it is important to determine a governance structure and assign responsibilities for the mechanism's implementation. The following basic preparations should be taken into account when evaluating resources and allocating responsibilities for grievance mechanism implementation:

- Make sure that the role of senior management is clear, i.e. in what cases and at what stage in the handling of a complaint their decision will be required, and who will be responsible for strategic oversight of grievance management. Senior management has final authority to ensure that commitments to affected communities are met, and clear reporting lines must be established between senior management and those implementing the grievance mechanism.

- Identify personnel or a unit responsible for administering the grievance mechanism (recording complaints, arranging for collection of additional information, consulting relevant departments or persons within the organization, tracking progress, aggregating and forwarding feedback to complainants, reporting). It may be a new or existing unit or person within an organization. Who is best suited to handle these tasks is sometimes determined by the nature of community grievances. Community liaison or an administrative assistant should serve as an entry point to receive and log complaints. Frequent turnover of staff assigned to grievance handling and community liaison can adversely impact the perception of the mechanism.
- It should be noted that other community engagement tasks do not take the place of handling grievances, particularly if a community liaison officer is also assigned to handle the grievance process.
- Where possible, functions of grievances handling should be separated from project management, and assign clear accountability for each, so as to avoid decisions that favour the interest of the contractor only. Safeguards can include clearly defining the authority and decision-making responsibilities of people involved in administering the grievance mechanism, as well as making sure that senior management is ready to intervene. These would include responsibilities for managing the overall process, as well as separate steps (receipt, recording and tracking, investigating, and responding).

3.3 Involving third parties

Third parties such as non-governmental organisations, community-based organisations, local governments, local community and religious organisations and traditional councils can sometimes be involved in companies' grievance mechanisms. They can serve as process organisers, places to bring a complaint to be passed on to the contractor, or as facilitators, witnesses, advisors, or mediators. In some cases, it may be beneficial to place part of the responsibility for the process on external entities, formed within the communities themselves or acceptable to them while the contractor maintains ultimate responsibility and accountability for the process. Third parties can help increase the level of trust from communities as well as overcome certain limitations of project-level mechanisms, such as lack of transparency, insufficient contractor resources, possible conflict of interest, and biases, provided that they themselves are perceived to be unbiased and impartial relative to both the contractor and the communities. It is recommended that the Local councils and Community Development Committees be the first point of contact.

3.4 Options for third party engagement

To have an effective project-level grievance mechanism, companies need to understand the roles of third parties before engaging them. For example:

Community self-governance structures (such as village councils, tribal councils). These should be taken into account when developing a grievance mechanism to ensure cultural appropriateness, community involvement in decision making, and efficient and effective use of existing community resources.

Local NGOs, CBOs - Identify those that are active in the area of project or company operations, learn about their interactions with the affected communities, determine what contribution they can make to effective resolution, and discuss options for an NGO to administer the project's grievance mechanism or a part thereof. Sometimes NGOs can also represent local communities and help them build their capacity to understand the process and its benefits, participate in decision making, and articulate grievances and bring them to the attention of companies. Such organizations can be viewed as a voice of communities, and companies should be prepared to deal with grievances brought by NGOs on behalf of communities.

Local government authorities. Communities sometimes bring their project-related complaints to local governments. It would be advisable for the contractor to consider partnering with local authorities to facilitate receipt of grievances from communities. Local governments can also be a resource to help companies resolve complaints, since local authorities may have an established relationship with the communities. They can participate as third parties and advisors in contractor-initiated resolution processes.

References

Reports:

Addressing Grievances from Project-Affected Communities. 2009. International Finance Corporation.

Ad Hoc Complaint Handling Mechanism (ACHM). 2016. Adaptation Fund.

Grievance Handling: Chapter 31. NamWater

Appendix A – AF Ad Hoc Complaint Handling Mechanism (ACHM)

7 October 2016

Adaptation Fund Board

AD HOC COMPLAINT HANDLING MECHANISM (ACHM)

(APPROVED IN OCTOBER 2016)

Ad Hoc Complaint Handling Mechanism (ACHM)

What is the ACHM?

1. The Ad Hoc Complaint Handling Mechanism (ACHM) is complementary to the Adaptation Fund's risk management framework, including the grievance mechanism required for accreditation of Implementing Entities.

2. The Adaptation Fund (Fund) makes the ACHM available to Implementing Entities and members of the communities that are adversely affected by the implementation of project/programmes funded by the Fund. The purpose of the ACHM is to assist in responding to complaints raised against project/programmes funded by the Fund through a participatory approach.

3. Complainants and implementing entities should use the implementing entity's grievance mechanism as a first step. However, the ACHM can be used in cases where the Parties have failed to reach a mutually satisfactory solution through the implementing entities' grievance mechanism within a year. The ACHM requires a written submission of a complaint by at least one of the Parties.

4. The Adaptation Fund Board secretariat (secretariat) will independently manage all aspects related to complaint handling, under the oversight of the Ethics and Finance Committee (EFC) of the Adaptation Fund Board (Board).[1]

5. The ACHM builds on alternative dispute resolution techniques.[2] Main features of the ACHM are to effectively facilitate dialogue among stakeholders, mediate/assist in resolving issues raised, and develop and share lessons to improve future operations.

How does it function?

6. **Receipt:** Within ***5 business-days*** of receiving a complaint, after determining whether the complaint is not excluded from the process as per below, the Manager of the secretariat informs the Parties of the receipt of the complaint.

7. In the course of information sharing between the Parties, the secretariat ensures that names and other identifiers are redacted if confidentiality is requested.

[1] See Adaptation Fund risk management framework, *available at* https://www.adaptation-fund.org/documents-publications/operational-policies-guidelines/.

[2] These include facilitation, mediation, cooperative or interest-based problem-solving, neutral evaluation, joint fact-finding, negotiation, conciliation, arbitration etc.

8. **Assessment and Agreement:** The secretariat, based on consultations with the Parties prepares a draft assessment report laying out the concerns and expectations of the Parties within ***20 business-days***. The Parties can provide comments to this report within ***10 business-days***.

9. The secretariat incorporates relevant comments into a public Final Assessment Report, annexing the Parties' comments and the complaint. The secretariat will design and include, in consultation with the Parties and based on their good faith, an agreed upon strategy towards the mutual understanding of the issues (confirming or dispelling complaints) and potential acceptable ways forward in order to reach solutions. The strategy will be based on alternative dispute resolution techniques. The Final Assessment Report is submitted to the EFC, which will make a recommendation for approval by the Board, as per the Fund's risk management framework.

10. **Non-objection by EFC on the Final Assessment Report:** The secretariat confirms that the agreement of the Parties is included in the Report. The secretariat then promptly circulates this report to the EFC by email and seeks their absence of objection within ***14 business-days***. If the objection is raised, the secretariat informs the Parties that the secretariat will cease all dispute resolution activities with regard to such complaint.

11. In case the non-objection is provided, the secretariat in consultation with the Parties and their participation implements the strategy. Relevant trust building measures or dispute resolution activities can be based on specific issues raised, or grouping of issues, addressing them independently one from the other, or holistically covering all aspects of the complaint.

12. **Implementation and Monitoring:** The ACHM requires trust building measures, and continued good faith engagement. Hence, it cannot be time bound. The secretariat will prepare and submit the update reports on the implementation of the agreed-upon dispute resolution strategy proposed in the Final Assessment Report. The Update Reports are submitted to the EFC. The cost for ACHM activities is covered by the Fund.

13. The ACHM is not a guarantee to achieving resolution. If within two Update Reports the ACHM was not able to implement any activity part of the dispute resolution strategy, the Manager of the Fund's secretariat in consultation with the EFC Chair may decide to suspend or terminate the dispute resolution activities.

14. In case the dispute resolution activities are suspended, the secretariat informs the Parties that the ACHM will temporarily cease with regard to such complaint and the reasons behind the suspension.

15. The Manager of the secretariat in consultation with the Parties revisits the decision to suspend dispute resolution activities on a bi-monthly basis. In doing so, the secretariat seeks the Parties' good faith agreement to reengage. The ACHM resumes such activities if the Manager of the secretariat in consultations with the Parties deems that conditions are met to do so.

16. **Remedy and Incentive:** In case such activities are to be terminated because of the lack of cooperation by any of the Parties, the secretariat may refer the complaint to the EFC, who may recommend to the Board the measures included in the Risk Management Framework.

17. **Resolution:** Once all matters are deemed resolved or dispute resolution activities are terminated, the secretariat issues a Final Resolution Report, making mention of any interim solutions reached in the process.

18. The secretariat will include in the Final Resolution Report a succinct analysis of systemic policy-related aspects that may have led to the complaint or its lack of resolution. Such aspects may include Policy compliance, institutional capacity, environmental and social risk management framework, weakness in supervision, technical expertise, disclosure and consultations, or other relevant aspects.

19. This report is shared with the Parties to provide their comments within ***14 business-days***. The secretariat incorporates any relevant comments in the Final Resolution Report, annexes the Parties' comments, and submits the report to the Board.

Who can complain, can it be confidential?

20. Any individual, or their representative(s), living in an area where impacts of a Fund-supported project may occur, can bring a written complaint forward to the secretariat.

21. If complainants believe that there may be a risk of retaliation for raising their concerns, they can request confidentiality. Confidentiality includes names, addresses, pictures and any other identifying information. This provision also applies to complainants' representatives or any other individual believed to be, at present time or in the future, at risk of retaliation.

22. Confidentiality can be requested at any time and is provided throughout the process. Except the secretariat, no one will have access to confidential information.

How and when to complain?

23. Complaints will be submitted in writing in any UN language.[3] However, when a complaint is not submitted in English and for the purposes of translation, additional time may be required to prepare the draft assessment report referenced in paragraph 8.

24. Contact information to submit a complaint are as follows: 1- by electronic email to afcomplaints@adaptation-fund.org; or 2- by hard copy to Adaptation Fund Board secretariat, 1818 H Street NW, N7-700, Washington, DC 20433, USA.

[3] The official languages of the UN are Arabic, Chinese, English, French, Russian and Spanish.

25. Complaints will indicate names and addresses of the complainants. They will also indicate whether representative(s) are appointed, listing the representative(s) names and addresses.

26. Complaints will include any information relevant to the project (i.e., title, location, sector, description ...) including the project activities believed to be the actual or potential source of the harm, the nature of the harm attributed to those activities.

27. Complaints can be sent up to the date of the submission of the final evaluation report of the project concerned.

Exclusions

28. Complaints with any of the following characteristics are excluded from the ACHM:
    a) Anonymous complaints (confidential complaints are different and provided for as per above);
    b) Frivolous, malicious, or vexatious complaints[4];
    c) Complaints from executing entities or their staff against the implementing entity with which they are contracting related to a contract between the executing entity and the implementing entity;
    d) Complaints related to activities that have no relevance to the Fund-supported project; or
    e) Complaints related to matters already addressed in the context of an earlier complaint and for which a solution was agreed upon, unless this complaint is based on new facts not known at the time of the initial complaint.

Disclosure

29. In accordance with Implementing Entities' fiduciary duties to comply with the standard on transparency, anti-corruption measures, and self-investigative authority, the Adaptation Fund will maintain a page on its website, the Accountability Register, relevant to the grievance mechanisms of the Implementing Entities. This page will list each Implementing Entities' grievance mechanisms as well as this ACHM.

[4] The generally accepted meanings of the terms "frivolous, malicious and vexatious" are as follows: (i) frivolous-trivial, trifling or futile, not serious; (ii) malicious-bearing active ill-will or spite, or having wrongful intention toward any other; and (iii) vexatious-causing or tending to cause irritation, frustration or distress, or not having sufficient grounds for action and seeking only to cause annoyance. The factors which may indicate that a complaint is frivolous, malicious or vexatious include the complaint: fails to identify clearly the substance or precise issues which require to be addressed; complains solely about trivial matters to an extent out of proportion to their significance; is part of a "tit for tat" complaint; continually changes, apparently to prolong the engagement with the ACHM; adds no new information from a complaint which has already been addressed by the ACHM; is made by a person who makes excessive contact or unreasonable demands, including abusive behavior and threats.

30. In the interest of transparency, the Adaptation Fund also dedicates on its Accountability Register a page for each complaint received where all relevant documents are disclosed, including final assessment reports, public notices, update reports, and final resolution reports. This page is cross-linked to the project's page.

31. Implementing Entities are encouraged to link the Adaptation Fund's Accountability Register to their website.

Appendix B – NamWater Grievance Handling: Chapter 31

CHAPTER 31

GRIEVANCE HANDLING

1. GENERAL

1.1 All employees have a right to lodge grievances in order to redress their feelings of dissatisfaction. The Grievance Procedure is aimed at resolving grievances in the fairest, fastest manner possible. Grievances are feelings of injustice or dissatisfaction affecting employees which may arise out of the work situation.

1.2 Appeals against disciplinary actions will not be dealt with through grievances.

1.3 Employees may lodge grievances without fear of victimisation or harassment.

1.4 Grievances should be resolved as quickly and fairly as possible and at the lowest level possible.

1.5 Aggrieved employees have the right to be assisted by an employee representative who may be a shop steward or a fellow employee.

1.6 Records of grievance hearings will be kept.

2. STEPS IN HANDLING GRIEVANCES

Step 1: Immediate Superior

(i) The employee must in the first instance discuss his/her grievance with the immediate superior**,** or the latter's superior in the event of a grievance against the immediate superior.

(ii) The superior must try to resolve the grievance within five (5**)** working days and inform the aggrieved employee accordingly.

(iii) The aggrieved employee, if not satisfied with the outcome, may appeal to the next higher level.

Step 2: Hearing

(i) The matter is referred to the relevant Manager.

(ii) The employee completes a grievance form with all relevant details. The employee may be assisted by the Industrial Relations Officer. The form is handed to the Divisional Manager.

(iii) The Manager shall hold an inquiry into the grievance which will be attended by the employee concerned, the respondent, the employee's representative, the Industrial Relations Officer and any other person(s) co-opted by the Manager.

(iv) The Manager must pronounce a decision within five (5) working days.

(v) If the aggrieved employee is still not satisfied, he/she may appeal to the General Manager concerned and the Chief Executive Officer whose decision will be final.

3. PROCEDURE FOR A GRIEVANCE THAT INVOLVES MORE THAN ONE EMPLOYEE

If the grievance lodged involves more than one employee, it is recommended that the employees (if more than ten) should select a spokesperson and at least two or three employees to represent the group.

4. ROLE OF AN EMPLOYEE REPRESENTATIVE

4.1 With a view to ensuring that grievances are dealt with efficiently, an employee representative is encouraged to be familiar with the relevant information (which will vary depending on the nature of the dispute) pertaining to the employee and the grievance, such as:

4.1.1 Conditions of employment and NamWater rules;

4.1.2 Knowledge of the work performed by the employee ;

4.1.3 Labour/employment legislation;

4.2 The representative is encouraged to -

4.2.1 Ensure that the employee expresses his/her grievance freely and openly;

4.2.2 investigate and clarify the grievance;

4.2.3 be able to distinguish fact(s) from opinion(s);

4.2.4 note the relevant facts;

4.2.5 establish what outcome is desired;

4.2.6 verify facts (third parties, knowledge, work performed, NamWater rules, regulations, conditions, line of authority, etc.)

4.2.7 decide whether the grievance is valid and advise the employee accordingly.

ROLE OF THE SUPERVISOR / MANAGER

The supervisor and/or Manager of a grievance meeting should –

4.3 listen and encourage the employee to express his / her grievance freely and openly;

4.4 clarify and investigate the grievance;

4.5 focus on the grievance not the employee's personality;

4.6 distinguish fact from opinion;

4.7 note the relevant facts;

4.8 establish what settlement is desired;

4.9 verify facts (third parties, knowledge, work performed, NamWater rules, regulations, conditions, line of authority, etc.);

4.10 obtain assistance from senior or human resources management if necessary.

5. DISPUTES/UNRESOLVED GRIEVANCES

If the grievance is not resolved internally then the employee(s) who lodged the grievance may pursue any remedies which may be available to them in terms of the Labour Act or any other applicable legislation.

Document prepared by

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Bringing ideas to life

Annexure 9: Letter of support from MAWF

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Office of the Permanent Secretary
Government Office Park
Private Bag 13184
WINDHOEK

LETTER OF SUPPORT

To: Adaptation Fund Board

C/O Adaptation Fund Board Secretariat

Email: secretariat@adaptation-fund.org

Fax: 202 522 3240/5

Subject: Letter of support of the proposed pilot Desalination Plant with Renewable Energy and Membrane Technology in Namibia

The Ministry of Agriculture Water and Forestry fully support the Namibia Water Corporation Ltd application for funding for the proposed pilot project on **Desalination Plant with Renewable Energy and Membrane Technology.**

We believe that, this pilot project will enhance our adaptive capacity to the effects of climate change and variability by improving the poor quality groundwater of the selected areas (i.e. Grünau and Bethanie village/settlement). If the concept is proven to be succeffully it will be replicated to other areas and thus ensure sustainable supply of sufficient and high quality drinking water as well for farming and industrial purposes.

Sincerely

PERMANENT SECRETARY
03 -08- 2017
Republic of Namibia
Ministry of Agriculture, Water & Forestry

PERCY MISIKA
PERMANENT SECRETARY
MINISTRY OF AGRICULTURE WATER AND FORESTRY

Date:_____

Annexure 10: Environmental clearance for the proposed pilot desalination plant at Bethanie

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Private Bag 13389
Windhoek
Namibia

Dear Sir

SUBJECT: ENVIRONMENTAL CLEARANCE FOR THE PROPOSED PILOT DESALINATION PLANT POWERED BY RENEWABLE AND MEMBRANE TECHNOLOGY IN BETHANIE DISTRICT, //KARAS REGION.

The Environmental and Social Management Plan submitted is sufficient as it made adequate provisions of the environmental and social aspects concerning the project's activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

This Ministry reserves the right to attach further legislative and regulatory conditions during the construction and operational phase of the project. From this perspective, I issue this clearance with the following condition: (a) relevant permitting authority involved must be properly consulted and written consent obtained from them, and (b) any key biodiversity habitats must be protected.

On the basis of the above, this letter serves as an environmental clearance for the proposed desalination plant utilising renewable power and membrane technology to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project activity. Instead, full accountability rests with Namibia Water Corporation and their consultants.

This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

MINISTRY OF ENVIRONMENT AND TOURISM
P/Bag 13306
Windhoek, Namibia
2017 -09- 01
Office of the
Environmental Commissioner

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER

"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Annexure 11: Environmental clearance for the proposed pilot desalination plant at Grünau

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel: (00 26461) 284 2111
Fax: (00 26461) 229 936

E-mail: damian.nchindo@met.gov.na

Enquiries: Mr. Damian Nchindo

Cnr Robert Mugabe &
Dr Kenneth Kaunda Street
Private Bag 13306
Windhoek
Namibia

01 September 2017

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

Chief Executive Officer
Namibia Water Corporation
Private Bag 13389
Windhoek
Namibia

Dear Sir

SUBJECT: ENVIRONMENTAL CLEARANCE FOR THE PROPOSED PILOT DESALINATION PLANT POWERED BY RENEWABLE AND MEMBRANE TECHNOLOGY IN GRUNAU DISTRICT, //KARAS REGION.

The Environmental and Social Management Plan submitted is sufficient as it made adequate provisions of the environmental and social aspects concerning the project's activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

This Ministry reserves the right to attach further legislative and regulatory conditions during the construction and operational phase of the project. From this perspective, I issue this clearance with the following condition: (a) relevant permitting authority involved must be properly consulted and written consent obtained from them, and (b) any key biodiversity habitats must be protected.

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Windhoek, Namibia
2017 -09- 01
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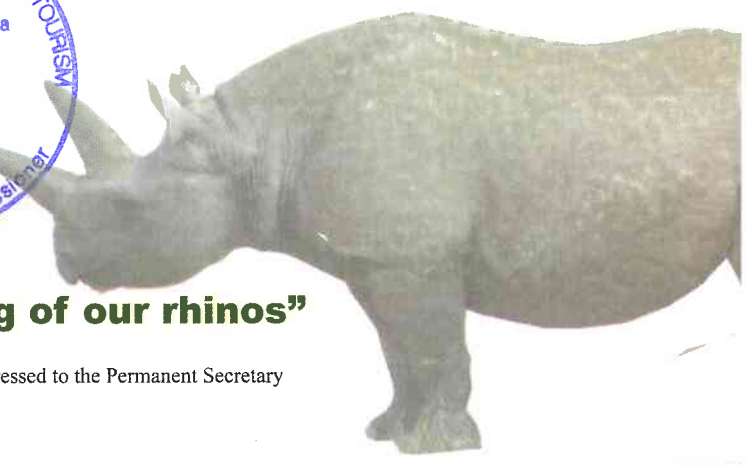
Environmental Commissioner

Yours sincerely,

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER



"Stop the poaching of our rhinos"