

PROPOSED SURFACE WATER DEVELOPMENTS FOR AUGMENTATION OF THE WESTERN CAPE WATER SUPPLY SYSTEM

Socio-Economic Impact Assessment

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Environmental, Social and OHS Consultants

P.O. Box 1673 147 Bram Fisher Drive Tel: 011 781 1730
Sunninghill Ferndale Fax: 011 781 1731
2157 2194 Email: info@nemai.co.za

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Prepared By:	Nemai Consulting		
	☎ +27 11 781 1730	🏠	147 Bram Fischer Drive, FERNDALE, 2194
	📠 +27 11 781 1730		
	✉ sameeram@nemai.co.za	📦	PO Box 1673, SUNNINGHILL, 2157
	🌐 www.nemai.co.za		
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Authorisation	Name	Signature	Date
Author:	Sameera Munshi		
Reviewed By:	Ciaran Chidley		

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Amendments Page

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Executive Summary

The Western Cape Water Supply System serves the City of Cape Town, surrounding urban centres and irrigators. It consists of infrastructure components owned and operated by both the City of Cape Town and the Department of Water and Sanitation. The Department of Water and Sanitation identified the need for augmentation of the Western Cape Water Supply System by 2019 and proceeded with pre-feasibility and feasibility studies into potential surface water development options. The studies gave rise to the Berg River-Voëlvelei Augmentation Scheme option was the most favourable surface water intervention and as such the Department of Water and Sanitation proposes to implement this scheme which involves the transfer of approximately 23 million m³ per annum from the Berg River to the existing Voëlvelei Dam i.e. the yield of the dam would be 23 million m³ per annum more than it is currently.

Nemai Consulting was appointed by the Department of Water and Sanitation as the Environmental Assessment Practitioner to undertake the Environmental Impact Assessment (EIA) for the proposed surface water developments for augmentation of the Western Cape Water Supply System.

The proposed augmentation triggers activities contained in the 2014 Environmental Impact Assessment Regulations (Government Notice 983, Government Notice 984 and Government Notice 985 of 4 December 2014) and thus a Scoping and Environmental Impact Assessment Process is required. Further, as the project occurs within a regulated area of a watercourse and involves abstraction of water, it triggers activities that are listed under Section 21 (a), (c) and (i) of the National Water Act (Act No. 36 of 1998). This report serves as the socio-economic impact assessment specialist study to the EIA.

The project is situated in Western Cape in the Drakenstein Local Municipality of the Cape Winelands District as well as the Swartland Local Municipality of the West Coast District. It fall within the Berg River Catchment of the Berg–Olifants Water Management Area. Both Voëlvelei Dam and the Lorelei abstraction site are located in quaternary catchment G10F of the Berg River Catchment.

The project components include the following:

- A low-level weir, abstraction works and 4 m³/s raw water pump station on the Berg River;
- A rising main pipeline from the Berg River to Voëlvelei Dam;

- A potential new summer release connection at the existing Swartland Water Treatment Works to facilitate summer releases into the Berg River for environmental requirements thus eliminating the need to utilize the existing canal from which water losses occur.

All the infrastructure and activities that require environmental authorisation need to be assessed as part of the EIA. In this regard, the following associated infrastructure was identified:

- Abstraction works;
- Rising main pipeline and pump station;
- Diversion weir;
- Access roads during construction;
- Access roads during operation; and
- Construction camp (footprint).

The project is located in a rural area where agriculture is the primary sector. In recognition of this, local government plans such as the IDPs have identified the need to support the industry. The support of the industry not only affected the commercial viability of the industry but also the livelihoods of those dependent on the sector for an income.

The socio-economic conditions of the surrounding town to the project are characteristic of rural communities in South Africa. These communities are poor, largely unskilled and have limited access to economic opportunities. Rather, migration to urban centres is required for income generation activities.

The project will improve access to cleaner water for the users of the Berg River, allowing for sustained provision of domestic and commercial water. In this light, the project should continue.

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1 INTRODUCTION

Nemai Consulting was appointed by the Department of Water and Sanitation (DWS) as the Independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for the proposed surface water developments for augmentation of the Western Cape Water Supply System (WCWSS), which is also known as the First Phase Augmentation of Voëlvlei Dam.

This Socio-Economic Impact Assessment serves as a specialist study to the EIA for the proposed surface water developments for augmentation of the WCWSS.

1.1 Terms of Reference

The terms of reference for the project is indicated below:

- Determine the specific local socio-economic, land utilisation and acquisition implications of the project.
- Collect baseline data on the current socio-economic environment.
- Assess socio-economic impacts (positive and negative) of the project,
- Undertake a thorough review of the following with the purpose of identifying landowner issues:
 - Minutes of public meetings and individual meetings; and
 - Comments and Response Report.
- Suggest suitable mitigation measures to address the identified impacts.
- Make recommendations on preferred options from a socio-economic perspective.

1.2 Structure of the report

The remainder of the report is structured as follows:

Section 2: *Legal Framework* – A description of the statutory and regulatory requirements that inform this report.

Section 3: *Project Description* – This section provide an introduction and motivation to the project.

Section 4: *Methodology* – Outline on the methodology used to determine the socio-economic impacts of the proposed project.

Section 5: *Situational Analysis*– A desktop analysis into the baseline context on the study area. A discussion on the finding that result from community engagement, site visits and stakeholder participation.

Section 6: *Identification of Activities, Aspects and Impacts* – The identification of the project activities and an investigation into what aspects of these activities will result in socio-economic impacts.

Section 7: *Impact Assessment* – An impact assessment with proposed mitigation measure and recommendations.

Section 8: *Conclusion* – Final remarks and management guidelines for a way forward.

2 LEGAL FRAMEWORK

Legislated Acts, Policy, Plans and Strategy provide an important framework and governance of the SEIA. This section provides a summary of the important Acts, Policy, Plans and Strategy which were accounted for in this study.

2.1 Constitution of the Republic of South Africa (Act 108 of 1996)

As contained in the Constitution the rights of all South Africans are protected as outlined in Chapter 2: the Bill of Rights. These rights form the basis of democracy in South Africa. The Constitution (including the Bill of Rights) binds the Legislature, the Executive, the Judiciary and all organs of state and is the overriding legislation of South Africa.

While all items in the Bill of Rights are considered to be of equal importance, key items in the Bill of Rights that have a bearing on social rights and issues in this project include (but are not necessarily limited to):

- Life: Everyone has the right to life;
- Human Dignity: Everyone has inherent dignity and the right to have their dignity respected and protected;
- Equality: Everyone is equal before the law and has the right to equal protection and benefit from the law;
- Freedom of religion, belief and opinion: Everyone has the right of freedom of conscience, religion, thought, belief and opinion;
- Environment: Everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development;
- Property: No person may be deprived of property except in terms of the law of general application, and no law may permit arbitrary deprivation of property. Property may be expropriated only in terms of the law of general application for a public purpose or in the public interest. The public interest includes South Africa's commitment to land reform and to reforms to bring about equitable access to all South Africa's natural resources. Property is not limited to land;
- Health care, food, water and social security: Everyone has the right to have access to health care services, including reproductive health care, sufficient food and water and

social security, including, if they are unable to support themselves and their dependents, appropriate social assistance;

- Language and culture: Everyone has the right to use the language and participate in the cultural life of their choice, but no one exercising these rights may do so in a manner inconsistent with any provision of the Bill of Rights;
- Cultural, religious and linguistic communities: Persons belonging to cultural, religious or linguistic communities may not be denied the right, with other members of the that community to enjoy their culture, practice their religion and use their language, and to form, join and maintain cultural, religious and linguistic associations and other organs of civil society. These rights must be exercised in a manner that is consistent with any provision in the Bill of Rights;
- Access to information: Everyone has the right of access to any information held by the state and any information that is held by another person and that is required for the exercise or protection of any rights; and,
- Just administrative action: Everyone has the right to administrative action that is lawful, reasonable and procedurally fair. Everyone whose rights have been adversely affected by administrative action has the right to be given written reasons. This right has been given effect via the Promotion of Administrative Justice Act ((PAJA) Act 3 of 2000).

2.2 National Environmental Management (Act 107 of 1998)

The National Environmental Management Act (NEMA) and the principles contained therein have a significant influence on the need to identify and assess socio-economic impacts. The NEMA principles are based on the basic rights as set out in Chapter 2 (Bill of Rights) of the Constitution.

According to Barber (2007:16) the following NEMA principles have an important impact on social issues:

- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably;
- Development must be socially, environmentally and economically sustainable;
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option;

- Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons;
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination;
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured;
- Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge;
- Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means;
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in light of such consideration and assessment;
- The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected;
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law;
- The environment is held in public trust for the people. The beneficial use of environmental resources must serve the public interest and the environment must be protected as the peoples' common heritage; and
- The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

2.3 National Water Act (Act 36 of 1998)

The principles of the National Water Act (NWA) recognize that sustainability and equity are central guiding principles in the protection, use, development, conservation, management and control of South Africa's water resources.

These guiding principles also recognize the basic human needs of current and future generations and the need to promote social and economic development through the use of

water. In this regard the purpose of the NWA is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account factors that are central to the assessment of social issues, including (Barbour, 2007):

- Meeting basic needs of current and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating, social and economic development; and,
- Providing for the growing demand for water.

2.4 Promotion of Administrative Justice Act (Act 3 of 2000)

The right to administrative action stated in the Bill of Rights has been given effect via the Promotion of Administrative Justice Act (PAJA). The provisions of the PAJA apply to all decisions of all organs of state exercising public power or performing a public function in terms of any legislation that adversely affects the rights of any person (Babour, 2007).

PAJA also prescribes the procedure that must be followed by an organ of state when it takes decisions. If an organ of state implements a decision that impacts on an individual or community without granting them an opportunity to comment, the ultimate decision will be unlawful and therefore may be set aside. The Act also imposes a duty on organs of state to explain and justify the manner in which they have reached their decisions and, in the case of social issues, how these issues were considered in the decision-making process (Babour, 2007).

2.5 Development Facilitation Act (Act 67 of 1995)

The Development Facilitation Act (DFA) outlines various principles concerning land development in Section 3 of the Act. Some of the relevant principles are briefly highlighted below (Babour, 2007). These principles include (but are not limited to):

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;
- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;

- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Promoting a diverse combination of land uses, also at the level of individual erven or subdivisions of land;
- Discouraging the phenomenon of "urban sprawl" in urban areas and contributing to the development of more compact towns and cities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Encouraging environmentally sustainable land development practices and processes;
- Promoting land development which is within the fiscal, institutional and administrative means of the Republic;
- Promoting the establishment of viable communities; and,
- Promoting sustained protection of the environment.

2.6 Restitution of Land Rights Act 22 Of 1994

The aim of the Restitution of Land rights Act 22 of 1994 is as follows:

- To provide for the restitution of rights in land in respect of which persons or communities were dispossessed under or for the purpose of furthering the objects of any racially based discriminatory law;
- To establish a Commission on Restitution of Land Rights and a Land Claims Court; and
- To provide for matters connected therewith.

2.7 National Development Plan (2011)

The National Development Plan (NDP) of 2010 proposes to “invigorate and expand economic opportunity through infrastructure, more innovation, private investment and entrepreneurialism.

The Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality. The core elements of a decent standard of living identified in the Plan are:

- Housing, water, electricity and sanitation;
- Safe and reliable public transport;
- Quality education and skills development;

- Safety and security;
- Quality health care;
- Social protection;
- Employment;
- Recreation and leisure;
- Clean environment; and
- Adequate nutrition.

2.8 National Water Resources Strategy (June 2013)

This strategy provides a national framework against which water resources across the country will be managed and in this sense aims to;

“...ensure that national water resources are protected, used, developed, conserved, managed and controlled in an efficient and sustainable manner towards achieving South Africa’s development priorities in an equitable manner over the next five to 10 years. This Strategy responds to priorities set by Government within the National Development Plan (NDP) and National Water Act (NWA) imperatives that support sustainable development. The NWRS2 acknowledges that South Africa is a water-stressed country and is facing a number of water challenges and concerns, which include security of supply, environmental degradation and resource pollution, and the inefficient use of water” (Department of Water Affairs, 2013a, p. iii).

2.9 Integrated Development Plan

The Municipal Systems Act 32 of 2000 requires municipalities to adopt and review their Integrated Development Plans, and throughout this processes must consult and involve the public. The following IDPs were reviewed for this report:

- Drakenstein Municipality IDP adopted in 2013 its 5 year strategic plan that will guide its development from 2013-2018 which is reviewed annually.
- Cape Winelands District IDP.

2.10 International Organisation for Standardization, ISO 14001:2004

The International Organisation for Standardization (ISO) is used for identifying impacts. The ISO 14001: 2004 – Environmental Management Systems definitions for aspect, activity and impact are used in keeping with best practice.

ISO 14001:2004 specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives and information about significant environmental aspects. It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence.

3 PROJECT DESCRIPTION

Voëlvlei Dam was commissioned in 1952 and was the first large water supply scheme in the Berg River Catchment. The main purpose of the dam is to supply water for domestic use to the West Coast District Municipality (DM) including Riebeek-Kasteel, Riebeek-Wes, Malmesbury, Darling, Moorreesburg and the City of Cape Town Metropolitan Municipality (CCT). The dam also supplies water for irrigation purposes along the Lower Berg River.

Voëlvlei Dam is owned by DWS and is currently over-allocated. It relies on existing diversion schemes from the Klein Berg River, as well as the Leeu River and the Twenty Four River whereby water from these rivers is diverted into two canal systems into the dam (DWA, 2012b). Water from the Voëlvlei Dam is supplied to the Water Treatment Works WTW and farms in the surrounding areas. Both the WCDM and the CCT own and operate the WTW.

As the dam is located within a winter rainfall area, it is filled during the wet winter months, from May to October, when about 90% of the annual runoff occurs. During this period the water requirement comprises only about 30% of the annual requirement. During the dry summer months, from November to April, inflows to the dam are small and irrigation and garden watering requirements in the urban areas are large.

The West Coast DM is confronted by an increased demand for water. It is more difficult to address these demands efficiently due to capacity constraints in the existing distribution schemes and water sources. The Department of Water and Sanitation (DSW) identified the need for augmentation of the Western Cape Water Supply System (WCWSS) by 2019. The Berg River-Voëlvlei Augmentation Scheme, which forms part of the WCWSS was therefore commissioned to transfer approximately 23 million m³ per annum from the Berg River to the existing Voëlvlei Dam.

The Berg River-Voëlvlei Augmentation Scheme project area is situated in Western Cape in the Drakenstein Local Municipality (LM) of the Cape Winelands DMs as well as the Swartland LM of the West Coast DM (**Figure 1**). The project components and related alternatives are discussed include the pipeline, abstraction works; Rising main pipeline and pump station; Diversion weir; construction access roads and construction camp (**Figure 2**) (**Table 1**).

The closest town to the proposed scheme is Gouda and it is located approximately 5km away from the proposed developments. The project developments are mostly located on privately-owned properties that are primarily used for agricultural practices, except for one property located north of the proposed pipeline which is owned by the Drakenstein LM. Some properties are owned by DWS. The properties that are directly affected by the proposed development are listed below (**Table 2**) (**Figure 3**).

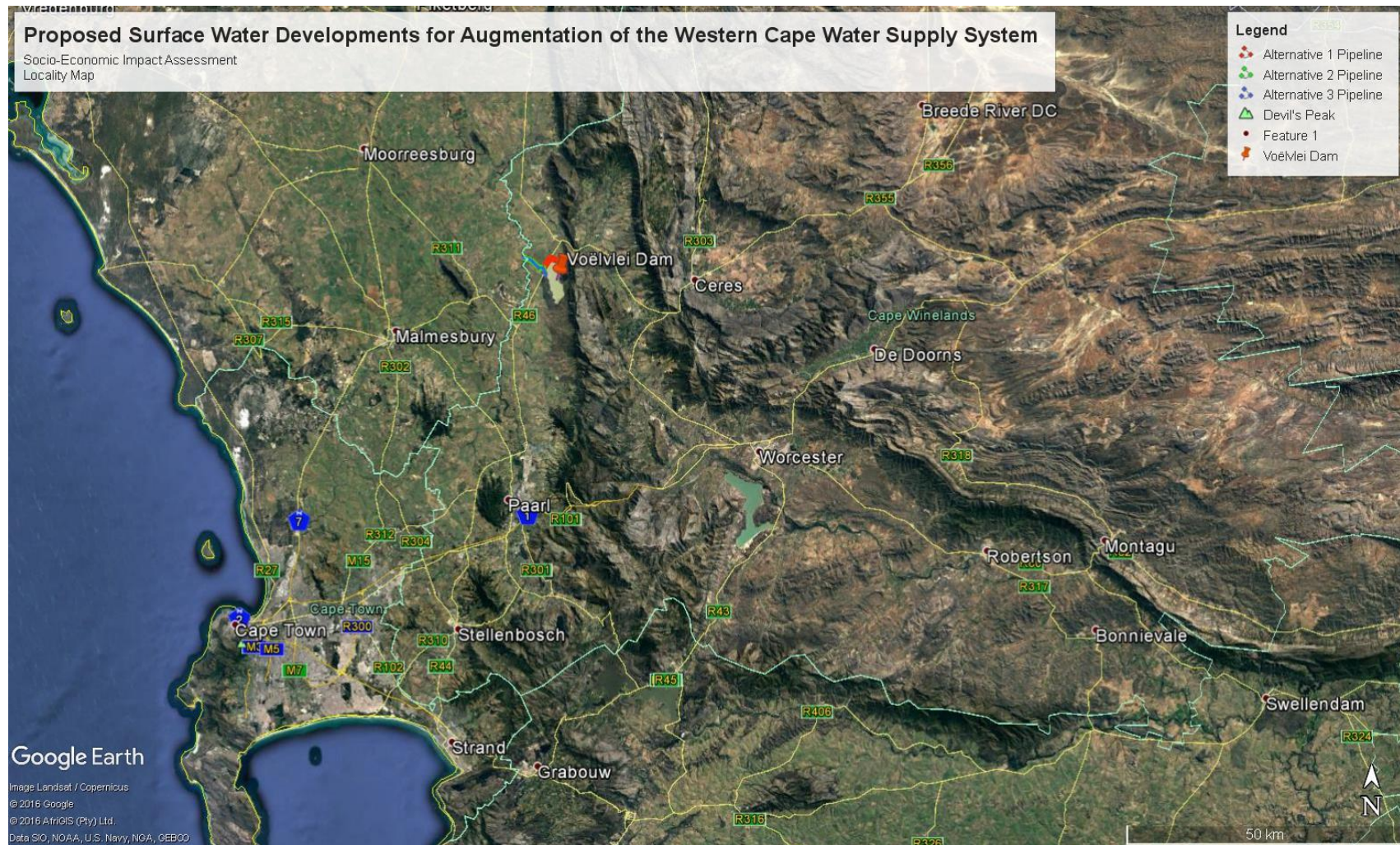


Figure 1: Locality Map

Table 1: Project Components and alternatives

Project Component	Description	Alternatives	
Rising main pipeline and associated Discharge Points from the Berg River to Voëlvlei Dam	Pipeline and discharge points from the proposed pump station to the discharge point at the Voëlvlei Dam. The servitude for the pipeline is 25m on each side, while the pipeline itself is 1.7m wide.	Alternative 1:	Northern Discharge Point = 8 115 m Located at the angling club
		Alternative 2:	Central Discharge Point = 5 000 m Located in close proximity to DWS staff houses
		Alternative 3:	Southern Discharge Point = 6 300 m Located on DWS owned land.
4 m ³ /s raw water pump station on the Berg River	During the winter abstraction period, water from the Berg River will flow into the sump at the pump station. A level transmitter on the diversion weir will provide an input value for the flow calculation to determine the amount of water to be abstracted and pumped to the Voëlvlei Dam.	No alternatives identified	
Low-level Diversion Weir and Abstraction Works on the Berg River	The abstraction weir has been designed as a 3m high. The total weir length is 160 m.	No alternatives identified	
Access Roads	Access roads to the weir and pump station site will be via existing unnamed farm roads in the study area. During flooding, these roads may not be accessible, therefore an unnamed farm road that runs southwards along the Berg River will be used. The servitude for the roads are 10m on each side (the access road width is approximately 6m).	Alternative 1:	Along unnamed farm roads. The route is 6.7 kilometres long and required the construction of 300m of new road.
		Alternative 2:	New access road that will be constructed as an alternative route to the weir and pump station. The route is 2.3 kilometres long.
Site laydown areas	Two alternative site laydown areas are proposed at the discharge point of pipeline alternative 2, both approximately 0.4 hectares and	Alternative 1:	At discharge point of pipeline alternative 2
		Alternative 2:	At discharge point of pipeline alternative 2

Project Component	Description	Alternatives
	will accessible from the R44. The main 0.85-hectare site laydown area is located at the pump station and will be accessible from the existing unnamed farm roads.	Main site laydown area is proposed at the pump station and weir site
New summer release connection to the existing Swartland WTW	To facilitate summer releases into the Berg River for environmental requirements thus eliminating the need to utilize the existing canal from which water losses occur	No alternatives identified

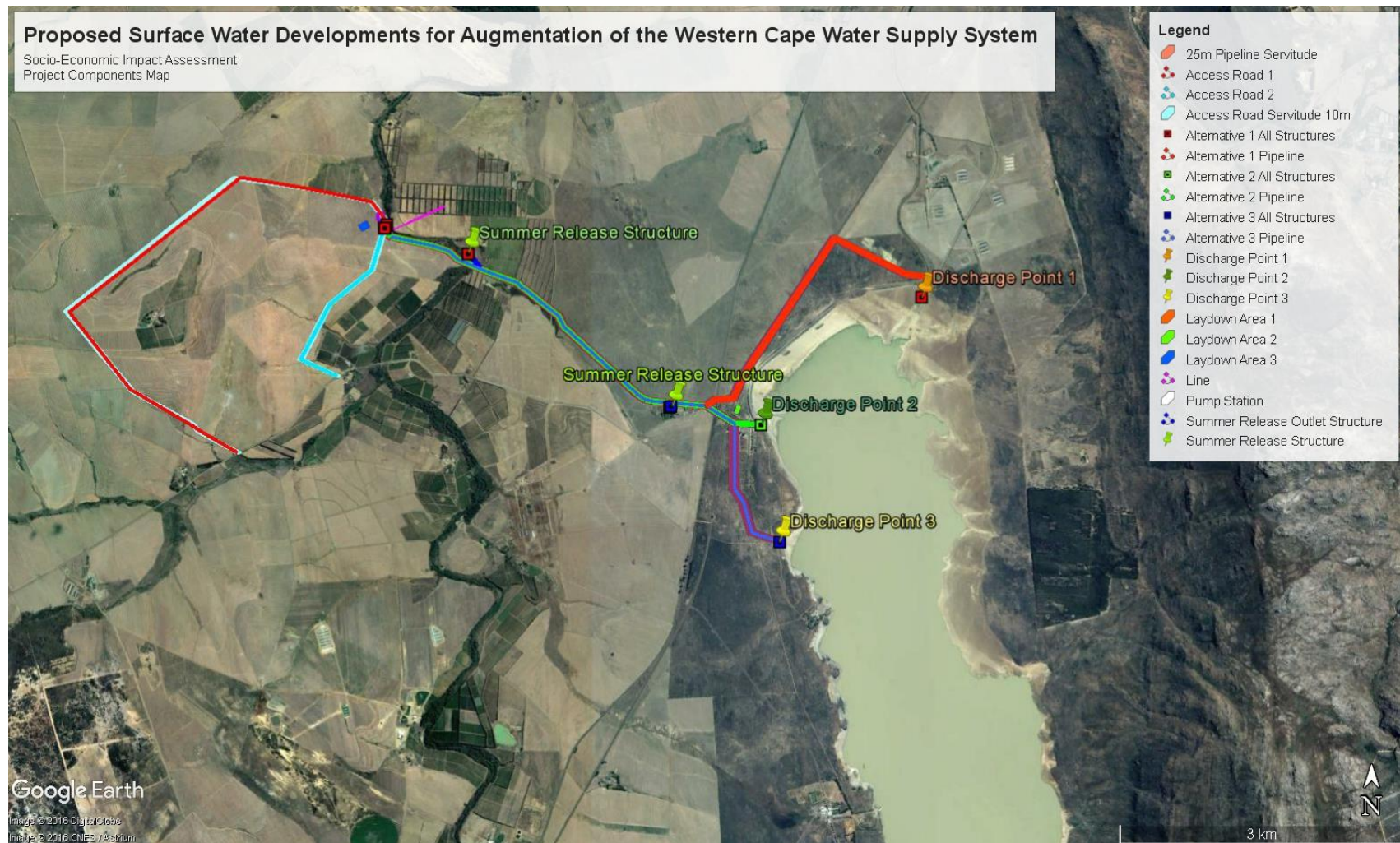


Figure 2: Project Components

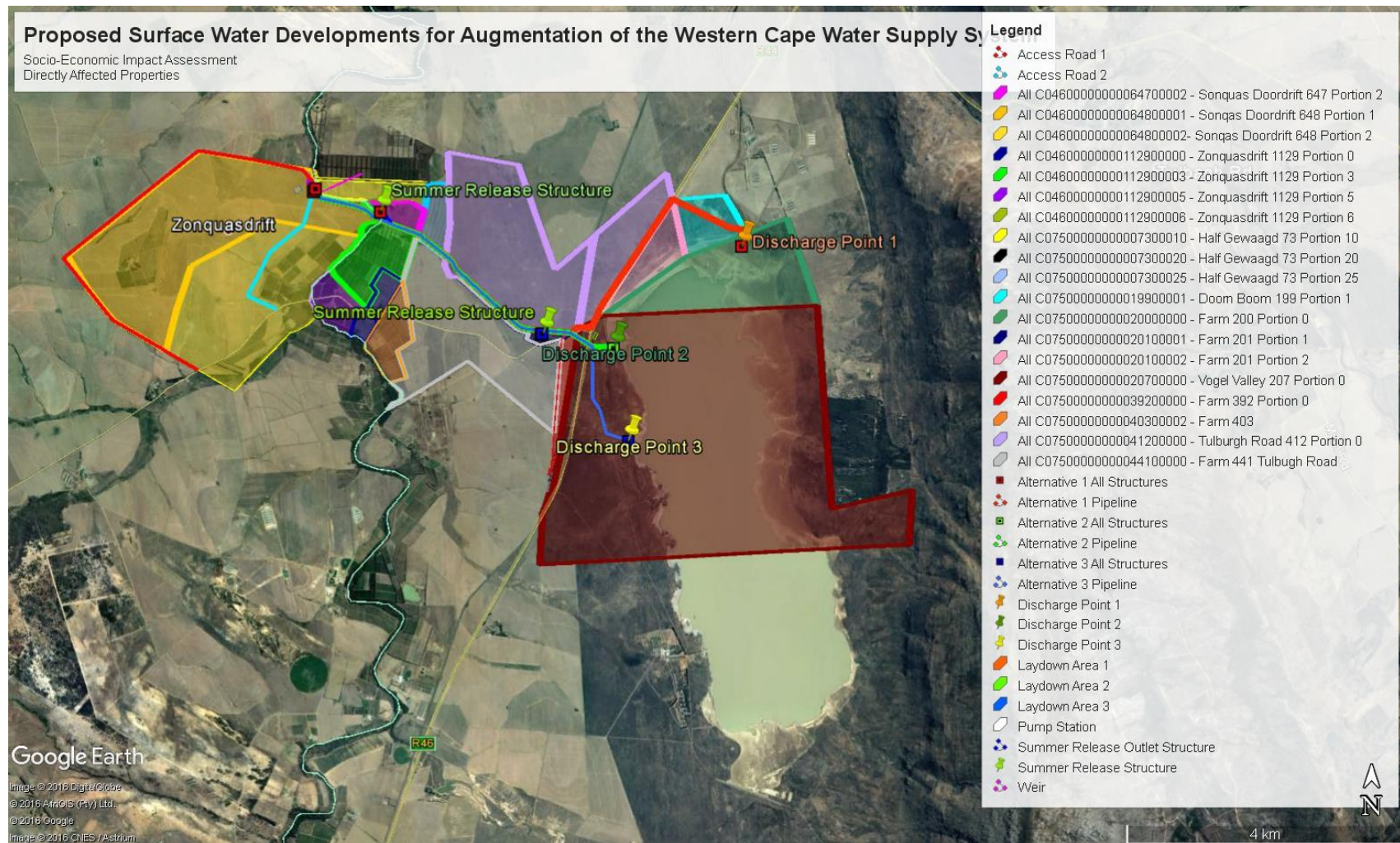


Figure 3: Directly affected properties

Table 2: List of properties affected by the project

Project Component	Farm Name	Portion	SG Code
Pipeline and associated Discharge Points	Half Gewaagd 73	21	C0750000000007300021
	Sonquas Doordrift 647	2	C04600000000064700002
	Tulburgh Road 441	0	C07500000000044100000
	Tulburgh Road 412	0	C07500000000041200000
	Tulburgh Road 412	0	C07500000000041200000
	Farm 201	2	C07500000000020100002
	Doorn Boom 199	1	C07500000000019900001
	Farm 200	0	C07500000000020000000
	Vogel Valley 207	0	C07500000000020700000
	Sonquas Doordrift 648	1	C04600000000064800001
	Zonquasdrijf 1129	3	C04600000000112900003
	Half Gewaagd 73	25	C0750000000007300025
	Farm 392	0	C07500000000039200000
	Farm 201	1	C07500000000020100001
Pump Station	Sonquas Doordrift 648	1	C04600000000064800001
Weir	Sonquas Doordrift 648	1	C04600000000064800001
Access Roads	Sonquas Doordrift 648	1	C04600000000064800001
	Sonquas Doordrift 648	2	C04600000000064800002
	Zonquasdrijf 1129	5	C04600000000112900005
	Zonquasdrijf 1129	0	C04600000000112900000
	Zonquasdrijf 1129	6	C04600000000112900006
	Farm 441 Tulbugh Road	-	C07500000000044100000
	Farm 392	0	C07500000000039200000
	Farm 422	0	C07500000000042200000
Construction Camps	Farm 92	2	C0750000000009200002
	Vogel Valley 207	0	C07500000000020700000
	Sonquas Doordrift 648	1	C04600000000064800001

4 METHODOLOGY

Socio-Economic Impact Assessment (SEIA) is an interactive process by nature which relies on both desktop research as well as input from the community. SEIA assist the community to be part of the environmental decision-making process, and empower communities to participate in decisions that will affect their livelihoods (DEAT, 2006).

The Australian Government Department of the Environment and Heritage (2005:5) states that Socio-economic Impact Assessment is a useful tool to help understand the potential range of impacts of a proposed change, and the likely responses of those impacted on if the change occurs.

An SEIA is used during the EIA process to identify and evaluate potential social, economic or cultural impacts of a proposed development. The SEIA recognises the important relationship between the economic, social and biophysical environment.

The SEIA will look at minimising adverse impacts of the proposed development while aiming to maximise the beneficial impacts. The SEIA sets out the socio-economic baseline, predicts impacts and makes recommendations for mitigation.

4.1 Sourcing of Information and Data Analysis

The socio-economic baseline level is based on both primary and secondary data. Primary data was collected directly from community members. Secondary data was accessed through South African Databases, available reports and articles, internet searches and are referenced in the text and in the reference section of this report.

The profile of the baseline conditions includes determining the current status quo of the community, including information on a number of social and economic issues such as Demographic factors; Socio-economic factors such as income and land tenure; and Statutory and Regulatory Environment.

The required information will be collected using different sources Statistics South Africa Census data; Quantec Research EasyData; through the review of municipal, district and private sector reports.

The Final Scoping Report for the proposed project provided the context for this report. The report assisted in provided the need and desirability of the project, the land use and information on the alternatives that required assessment. The Comments and Response Report which forms part of the Scoping Report highlighted the concerns from the community. The report was compiled using information from public meetings and correspondence.

The discussion of the demographics and the development profile of the municipality were carried out using Census 2011 data, produced by Statistics South Africa.

The Census 2011 data is the most comprehensive dataset available for the area, and it is currently the best data at hand. The analysis will be conducted using the Census 2011 municipal data as the project area is vast. The ward and municipal data have been extracted using the project GIS, and the data for the affected areas will be presented in the table and figures.

Quantec Research (Pty) Ltd is a South African based consultancy which focuses on the marketing, distribution and support of economic and financial data, country intelligence and quantitative analytical software. Quantec Research maintains and distributes a comprehensive set of data collections covering macro and regional socio-economic, industry and international trade data. Data such as gross value added and the unemployment rate were sourced from Quantec Research.

A Geographic Information System (GIS) was used to conduct a thorough analysis of the area. The use of GIS brings together the demographic and economic data into graphic form enables a thorough and more accurate analysis.

4.2 Impact Assessment

Impact assessments allow for an estimate of the significance of the identified social and economic impacts to those who will be affected. In addition, the response of the affected parties to such impacts also needs to be clarified (Centre for Good Governance, 2006). All impacts will be analysed with regard to their nature, extent, magnitude, duration, probability and significance (Barbour, 2007). Section 8 lists the definitions that apply to the impact assessment.

The determined impacts are clustered around a common issue and are assessed before and after mitigation. The identification of the socio-economic impacts associated with the project is issues-based, with the main headings referring to a common theme addressing several related impacts. Under each of these issues the specific impacts and potential mitigation strategies are discussed for pre-construction, construction, operation and decommissioning phases.

4.3 Assumptions and Limitations

- It is assumed that information obtained during the interviews provide an honest account of the community and community relationship to the dam. It must be noted, however, that meetings are not statistically representative.

- It must be assumed that all the interview reports are based on reflections provided by those present and may or may not necessarily be a reflection of future conditions.
- The study was done with the information available to the specialist at the time of executing the study, within the available time frames and budget. The sources consulted are not exhaustive, and additional information which might strengthen arguments, contradict information in this report and/or identify additional information might exist. However, the specialist did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude information relevant to the assessment.

5 SITUATIONAL ANALYSIS

The following section provides a detailed description of the social and economic environment. In this section, demographics such as population and gender, education, and utilities are discussed. An economic overview follows with information on employment and industry is also outlined.

There is a geographical impact related to the physical infrastructure. A vast majority of the impacts that are likely to occur from the proposed project will be geographically bound. The closer the proximity to the bulk infrastructure, the higher the impact will be. In order to assess this geographical impact, the Statistics South Africa 2011 Municipal Ward boundaries has been used to analyse data. Majority of the project falls within Ward 31 of Drakenstien LM and Ward 12 of Swartland LM (**Figure 5**).

5.1 Land use

The project is located adjacent to the Voëlvlei Dam and is part of the Berg River Catchment which is approximately 9 000 km² in size (DWAF, 2007). Land use within the Berg River catchment comprises mainly of dryland wheat farming, livestock farming, plantation forestry, commercial industry, fruit farming, urban areas and nature conservation. The major industries are agriculturally based (grapes and deciduous fruits) and includes wineries, canneries and other food processing factories (DWAF, 2007). Grain farming is also a dominant land use in the Catchment. The Voëlvlei Nature Reserve is located on the dam and in close proximity to the site.

The town of Gouda, located in Ward 31 is predominantly a rural town established in support of the agricultural activities in the surrounding area (Drakenstein Local Municipality, 2013) (**Figure 6**). Commercial activities in the town include fruit storage and packaging facility (Karsten Fruit Packers), five shopping facilities and a hotel located in the western portion of town.

Surrounding small towns to Gouda include Saron, located 10km north-east of the study area, Riebeek West is a hill side town approximately 14 km west of Gouda and Riebeek Kasteel, located 14 km west of Gouda. In Ward 12, Riebeek Kastaal is the main town. The town is one of the oldest in South Africa and houses the first South African hotel. The aesthetical appeal of Riebeek Kastaal attracts artists to the area.

Agriculture is the largest industry and main commercial use of land in the region. Each of the small towns listed above are surrounded by agricultural activity and in support the industry.

Access to the area is via rail and road. The R44 and R46 are the two main regional routes connecting the project area to urban centres. The R44 connects the project area to Piketburg in the north and Wellington in the south. The R46 connects the study area to Riebeeek Kastal in the west and Ceres in the East. Both roads carry commercial, tourist and residential traffic. In terms of rail access, there is a regular rail service connecting Gouda to the City of Cape Town.

The Voëlvlei dam, the Bergriver and Limietberg mountains has attracted a tourism industry to Gouda. Recreational facilities include swimming, fishing, canoeing and yacht sailing, hiking, bird watching and finding wild flowers like proteas and other rare and endangered species, including snakes, baboons, and cheetahs.

Use of Voëlvlei Dam

Water uses of the Voëlvlei Dam include the following:

Domestic Use

The primary purpose of Voëlvlei Dam is to provide domestic water to West Coast DM and City of Cape Town. There is a planned augmentation scheme to increase the capacity of the Dam.

Irrigation

The Dam also provides some water for irrigation to farmers in the Lower Berg River. Water is released for irrigation up to the Estuary. Many of the directly affected landowners are farms who obtain water from the dam.

Land use at the dam: DWS have a staff quarters on the dam where they currently are a discharge point.

Recreational Use

The main recreational clubs that make use of the Dam are the Vogelvlei Yacht Club (VYC), Western Province Artificial Lure Angling Society (WPALAS), Western Province Freshwater Angler's Association (WPFSA), Tulbagh Angling Club (TAC); Witzenberg Angling Club (WAC) and the Cape Piscatorial Society (CPS).

The following recreational activities commonly take place at the Voëlvlei Dam:

- Bird-watching;
- Fishing from shore;
- Boardsailing/windsurfing;
- Fishing from boats;
- Swimming;
- Yachting; and

- Picnicking and sunbathing.

A number of events are held at the dam including various angling competitions (for Bass and Carp) as well as a number of Regattas. VYC has also organised a triathlon at the Dam in recent years. The Stanford Bird Club has also visited the dam for their bird fairs in the past.

A water treatment works and staff residents are located at the proposed summer release structure 2. Additional DWS staff houses are located at the alternative 2 discharge point. The staff manage the dam.

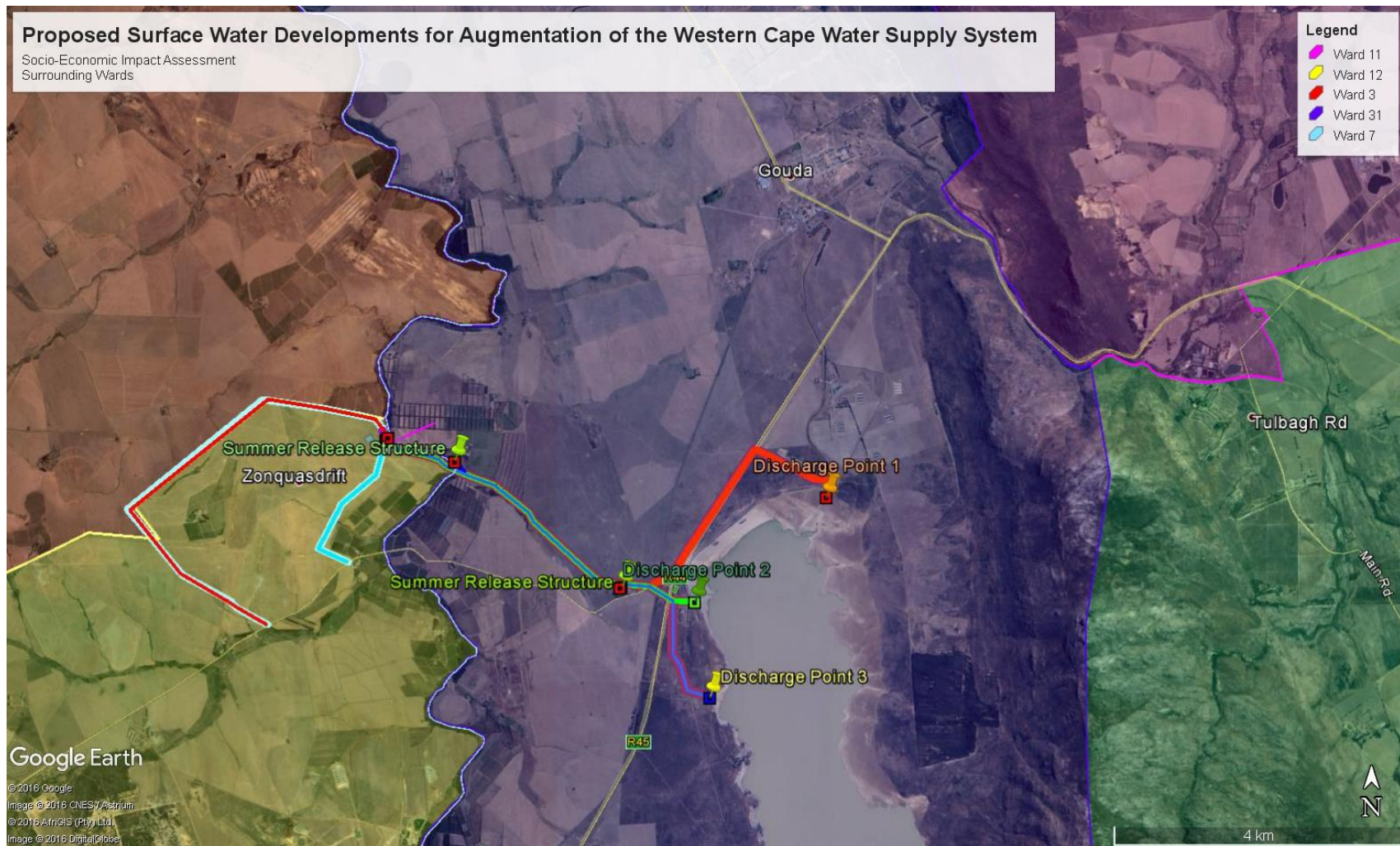


Figure 4: Google Earth image of the wards surrounding the development

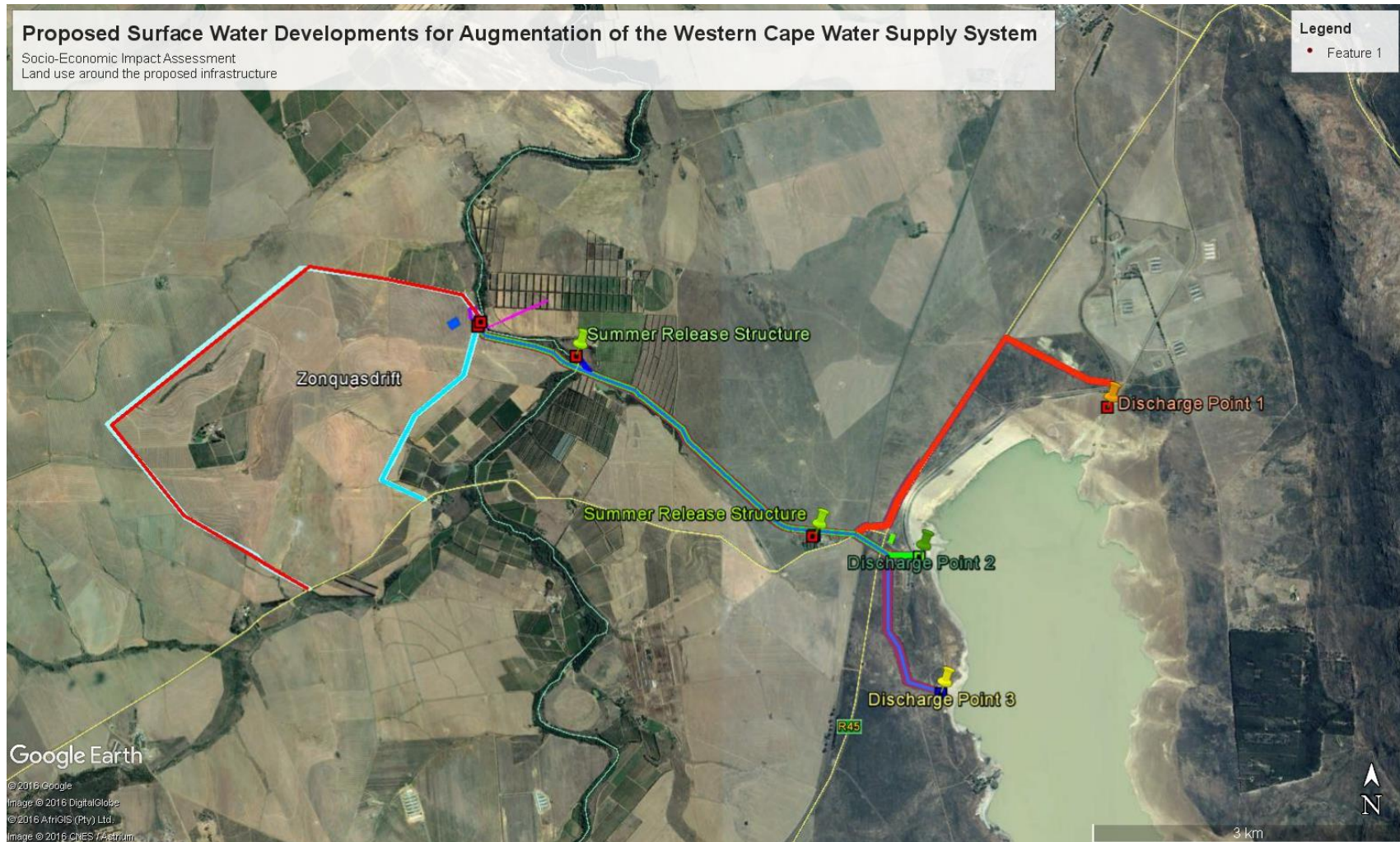


Figure 5: Google Earth Image of the surrounding land use to at the project components

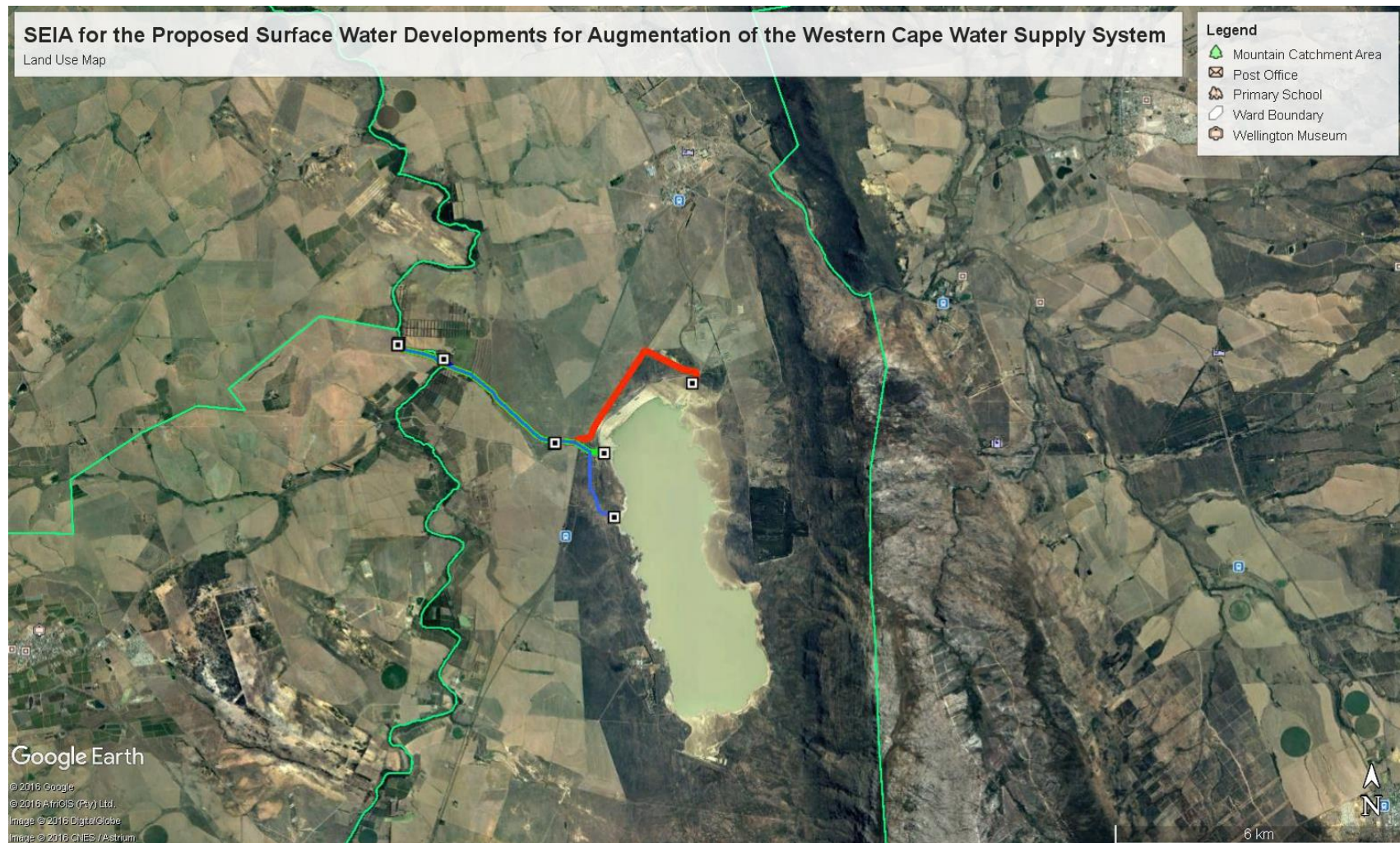


Figure 6: Google Earth image of surrounding land use

5.2 Population, Age and Gender

The total population for the two wards is 18 729 persons. Ward 31 has a population of 8 301 persons while Ward 12 has a larger population of 10 428. Majority of the people live in the towns of Gouda (Ward 31) and Riebeeck Kastaal (Ward 12).

Table 3: Population, Age and Gender in 2011

Age and Gender	Ward 31		Ward 12		Total
	Male	Female	Male	Female	
00 - 14	1 074	1 236	1 461	1 335	5 106
15 - 34	1 671	1 314	1 932	1 749	6 666
35 - 64	1 257	1 371	1794	1 692	6 114
65+	159	219	213	252	843
Total	4 161	4 140	5 400	5 028	18 729
	8 301		10 428		
00 - 14	13%	15%	14%	13%	27%
15 - 34	20%	16%	19%	17%	36%
35 - 64	15%	17%	17%	16%	33%
65+	2%	3%	2%	2%	5%
Total	50%	50%	52%	48%	100%

The age group 15 – 64 is defined as the working age population. In total, this group accounts for sixty-nine percent of the population in the study area. The population is fairly young, with over sixty percent below the age of 35.

There are more males than females in the Ward 12, and of working age population which differs to South Africa in general, where there are more females than males. In Ward 31 there is no overall difference in the gender ratio.

5.3 Education

Education levels are assessed in order to understand the potential grade or level of employment as well as livelihood of the community. Furthermore, it indicates the functional literacy and skill level of a community. The table below shows the highest level of education reached by persons over age 20 in the study area in 2011(**Table 4**).

Table 4: the highest level of education reached by persons over age 20 in the study area in 2011

Education	Ward 31	Ward 12
No schooling	6%	6%
Some primary	27%	28%
Completed primary	9%	8%
Some secondary	31%	24%
Grade 12/Std 10	10%	9%
Higher	3%	5%
Unspecified	0%	0%
Not applicable	14%	19%

Education levels in the are quite low with less than 15 percent of the population over age 20 having received a matric or higher qualification.

Approximately a forty percent of the population have no education or have not completed primary education and are considered to be functionally illiterate. Functional illiteracy is defined as a person who has received skills to read and write that are inadequate to manage daily living and employment tasks that require reading skills beyond a basic level. Usually persons who have a low level of education, up to primary education, are classified as functionally illiterate.

Economic theory proves that education improves the level and quality of human capital, in turn increasing the productivity of individuals. Thus increasing the output generated per worker. Education facilitates long term growth and is critical to escape the poverty trap.

Economic theory is proven in practice in a study conducted by Altbeker and Storme (2013). The study shows that while the number of graduates in South Africa has more than doubled in the past fifteen years; the unemployment rate amongst graduates has declined to around five percent.

Furthermore, the study shows that the change of employment increases as the years of education increase. **Figure 8** below is a graph taken from the Altbeker and Storme study that shows the labour force participation (LFP), employment and unemployment rates by years of education in 2007 (Evelien & Altbeker, 2013).

Figure 8 demonstrates that only thirty-three percent of those who had less than secondary education (eleven years or fewer) had jobs. This rose by twenty percent on completion of secondary school. With one extra year of education after secondary school, employment increased to seventy-one percent. Those with higher education again enjoyed ten percent rise in employment while post-graduate degree holder's employment was the highest at ninety-six percent (Evelien & Altbeker, 2013).

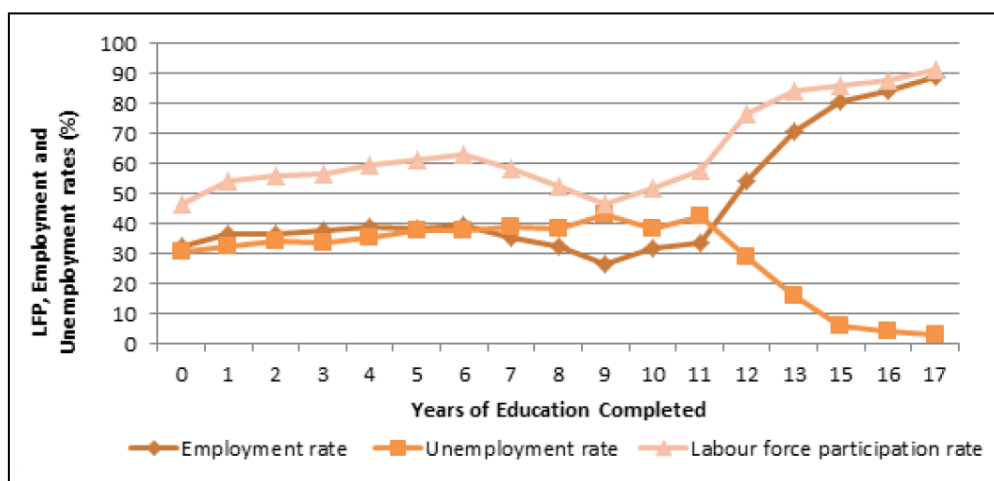


Figure 7: Labour force participation, employment and unemployment rates by years of education (2007) (Evelien & Altbeker, 2013)

The Altbeker and Storme study, in conjunction with the data shown above, reveal that education levels in the study area are so low that the communities in these two wards are structurally geared towards unemployment and thus poverty. The community is economically dependent on the less than fifteen percent of the population who have completed high school or higher education. It is only this group that is likely to earn an income in the middle or high income bracket, resulting in a perpetuating cycle of low education and low income levels.

The intervention of an external entity is required to improve current education levels. A generation of youth with some form of higher education is required to break the poverty cycle in this area.

5.4 Dwelling

The characteristics of the dwellings in which households live and their access to various services and facilities provide an important indication of the well-being of household members. It is widely recognised that shelter satisfies a basic human need for physical security and comfort.

According to the Statistics South Africa household classification, the following definitions apply to formal and informal housing (**Table 5**):

- **Formal dwelling** refers to a structure built according to approved plans, i.e. house on a separate stand, flat or apartment, townhouse, room in backyard, rooms or flatlet elsewhere. Contrasted with informal dwelling and traditional dwelling; and
- **Informal dwelling** is a makeshift structure not erected according to approved architectural plans, for example shacks or shanties in informal settlements or in backyards.

Table 5: Type of Dwelling, 2011

Type of Dwelling	Ward 31	Ward 12
Formal Dwellings	94%	90%
House or brick/concrete block structure on a separate stand or yard or on a farm	78%	83%
Traditional dwelling/hut/structure made of traditional materials	0%	0%
Flat or apartment in a block of flats	1%	2%
Cluster house in complex	0%	0%
Townhouse (semi-detached house in a complex)	0%	0%
Semi-detached house	14%	4%
House/flat/room in backyard	0%	0%
Room/flatlet on a property or larger dwelling/servants quarters/granny flat	0%	0%
Traditional dwelling/hut/structure made of traditional materials	0%	0%
Informal Dwelling	4%	9%
Informal dwelling (shack; in backyard)	4%	7%
Informal dwelling (shack; not in backyard; e.g. in an informal/squatter settlement or on a farm)	0%	1%
Other	2%	1%
Caravan/tent	0%	0%
Other	2%	0%

Majority of the households in the wards have formal dwellings with close to eighty percent of dwellings being houses on a separate stand or yard on a farm. Fourteen percent of households in Ward 31 are semi-detached houses. In Ward 12, seven percent of the population live in informal dwelling structures.

5.5 Annual Household Income

Annual household income is important to assess as it provides information on the poverty level of the community. Unskilled communities tend to generate low incomes to the household, which contributes to poverty.

Table 6: Annual Household Income per Ward for 2011

Annual Household Income	Ward 31	Ward 12
No income earning households	6%	6%
Low income earning households	72%	71%
Middle income earning households	21%	21%
High income earning households	1%	2%

Annual household income on the two wards are very similar, with over seventy percent of households earning in the low-income category. A further six percent of households earn no income at all resulting in close to eighty percent of the population living in or close to poverty.

5.6 Access to piped water

Understanding the water supply provides insight into the municipal level of service of a community as well on the standard of living.

Access to piped (tap) water is important to understand the level of health and standard of living in an area. In each of the wards, while household have access to piped water within the basic level of service, there is a need for improvement of water services in the study area as four percent households have no access to water services.

Table 7: Household access to piped water

Household access to piped water	Ward 31	Ward 12
Piped water inside dwelling/institution	73%	83%
Piped water inside yard	25%	12%
Piped water on community stand: distance less than 200m from dwelling/institution	1%	3%
Piped water on community stand: distance between 200m and 500m from dwelling/institution	0%	0%
Piped water on community stand: distance between 500m and 1000m (1km) from dwelling/institution	0%	1%
Piped water on community stand: distance greater than 1000m (1km) from dwelling/institution	0%	0%
No access to piped water	0%	1%

All formal households and nearly all informal households in the ward have access to piped water at ninety-eight percent of households in Ward 31 and ninety-five percent of households in Ward 12. One percent of households in Ward 1 have no access to piped water.

5.7 Employment

The official unemployment definition or strict definition of unemployment is as follows:

- The person did not work during the seven days prior to the survey interview, and does not have any job attachment.
- The person wants to work and is available to start work within 2 weeks.
- The person has taken active steps to look for work or to start own business in the 4 weeks prior to the interview (Quantec Research Ltd Pty, 2013).

Discouraged workers are defined as:

- The person did not work during the seven days prior to the survey interview, and does not have any job attachment.
- The person wants to work and is available to start work within 2 weeks (Quantec Research Ltd Pty, 2013)

The labour force comprises all persons who are employed plus all persons who are unemployed. Ward 31 has a labour force of 4 407 and Ward 12 has a labour force of 3 093 (**Table 8**).

Table 8: Labour Force

Labour Force	Ward 31	Ward 12
Employed	35%	40%
Unemployed	2%	2%
Discouraged work-seeker	1%	0%
Other not economically active	29%	26%
Not applicable	32%	31%

There are 106 030 economically active (employed or unemployed but looking for work) people in the municipality, and of these 17.6% are unemployed (**Figure 52**). Of the 50 279 economically active youth (aged 15–34) in the municipality, 24.6% are unemployed.

According to the municipal IDP, the unemployment rate for the Drakenstien LM twenty-three percent. In Swartland LM at twenty-five percent in 2010 with thirty-two percent of the population living in poverty.

5.8 Public Participation

During the application and scoping phases, extensive public engagement took place and included:

1. Notification to all directly affected landowners of the proposed development;
2. Identification of IAPs;
3. Distribution of a background information document;
4. Placement of on-site notices
5. A public meeting held on 04 October 2016; and
6. Focus groups held on 27 September 2016.

A site visit and engagement with directly affected farmers took place on 25 May 2017.

Overall, the public engagements were encouraging as affected parties understood the need for the project and its desirability. Farmers encouraged the supply of water in the summer months. Currently the area is undergoing a draught. At such a time, it is expected that little resistance to any project that will increase water security would be objected to.

There was one strong objection to the project raised from one farmer who was concerned that the project affect the water supply on his land. Currently the farmer abstracts water from a wetland located on his property. The farmer is of the opinion that the wetland will no longer be fed through the canal as this project diverts the water away from the canal. Thus the runoff from the canal system would not reach the dam located on his property and he will not be able to abstract water from the wetland, leaving him with less water than required for irrigation. Hence, he is concerned of the impact on his farm where principle activities include the export of fruits and farming of 35ha of citrus.

Furthermore, a new pump station and associated infrastructure will be required to abstract water from the Berg River.

It is noted that an aquatic and wetland study was commissioned as part of the EIA. The results of the wetland study indicate that the wetland, which is largely manmade, will not dry up as a result of this project.

On the main, other feedback from the farmers related to the technical aspects of the project such as not abstracting polluted water from the first floods, the monitoring of overflow from the Dam; the redundancy of the existing canal etc.

That said, impacts that have related to the feasibility of agricultural practices were raised and include:

- How the project will impact of long term agricultural plans were raised. Some farmers have stated that the;
- The impact of dust on crops;
- During the first flood, the river becomes polluted and therefore the water from the first flood should not be abstracted;
- The impacts of the proposed developments on the water quality of the Dam and the Berg River;
- The infrastructure is to avoid existing buildings;
- Impact on property;
- Impact on the construction of infrastructure;
- The impact of access roads on existing properties; and
- That the project should cater for existing downstream users of the Berg River.

6 IDENTIFICATION OF IMPACTS

The methodology for the identification of impacts was threefold. Firstly, an assessment of the scoping phase took place. This was followed a desktop analysis. Finally a stakeholder and site analysis was conducted.

The assessment of the scoping phase was important to understand the project details, location and possible impacts. In this section, the Geographic Information System was used to conduct a thorough analysed of the area. Project details were understood and located.

The second aspect to the identification of impacts was a desktop study. Data on the community such as population statistics; health; education; and services were analysed using Census 2011 data. The economic environment of the community was also analysed. A desktop study is important to understand the social and economic conditions of the area. It also allows

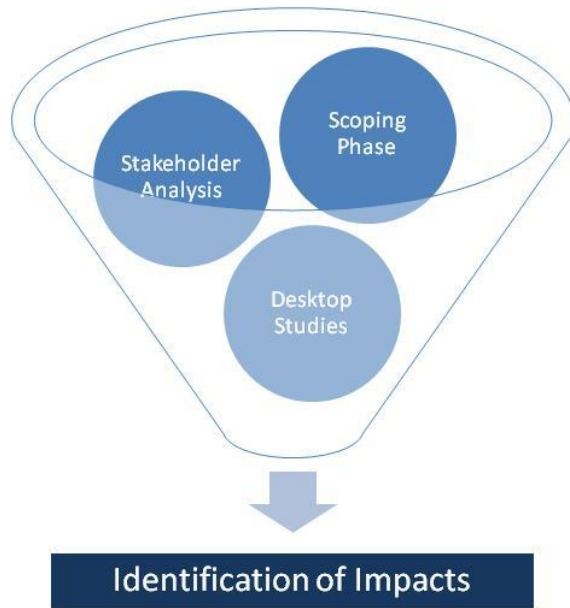
one to identify the challenges faced by the community. Not only does the desktop study facilitate site visits; it also directs the discussion during interviews. Finally, stakeholder engagements as per the scoping report were analysed.

Using this methodology, aspects were identified from the activities that proposed. These aspects have triggered impacts which will be discussed in Section 7. In order to contextualise the impacts, the activity and aspects have been outlined and discussed below.

According to ISO 14001-2004 4.3.1 Environmental Aspects; the Organisation shall establish, implement and maintain a procedure(s)

- To identify the environmental aspects of its activities, products and services within the defined scope of the environmental management system that it can control and those it can influence taking into account planned new developments or new or modified activities, products and services, and
- To determine those aspects that have or can have significant impact(s) on the environment (i.e. significant environmental aspects) (International Organization for Standardization, 2011).

For the purposes of this section, ISO 14001-2004 definitions as applicable to the project include:



Activity	Activity” is defined as a distinct process or risks undertaken by an organisation for which a responsibility can be assigned activities also include facilities or pieces of infrastructure that are possessed by an organisation.
Aspect	Elements of an organisation’s activities or products or services that can interact with the environment. There are two types of aspects namely; <ul style="list-style-type: none">• Direct Environmental Aspect: Activities over which a company can be expected to have an influence and control; and• Indirect Environmental Aspect: Actual or Potential activities over which the organisation can be expected to have an influence, but no control (International Organization for Standardization, 2011).
Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s environmental aspects”

The proposed development will include the construction of various infrastructure more than 100m² in size within 32m within the Berg River. The proposed development involves the transfer of approximately 23 million cubic metres per annum between the Berg River and the existing Voëlvlei Dam. Water from the Dam is abstracted by West Coast District Municipality and City of Cape Town. The infrastructure includes:

- Low level weir which extends well onto the right bank and will also exceed 100m².; A new rising main pipeline will be constructed in order to transfer water from the Berg River to the existing Voëlvlei Dam. The pipeline will be between 5000 and 8115m in length and will have a diameter of 1.7m;
- Pump station with a footprint in the order of 80 x 30m (~2400m²) on the left bank (looking downstream).
- The exact dimensions of the Pump Station are not known however together with weir, clearing will likely exceed 1 ha.
- The footprint of the pump station alone will be in the order of 80 x 30m (~2400m²) on the left bank (looking downstream). The weir footprint extends well onto the right bank and will also exceed 100m².
- The main access road is proposed to be via the existing Sonquasdrift Road, from where access would then be via existing farm roads (the farm roads would need widening). Sonquasdrift Road currently crosses the Berg River in the direction of Riebeeck Kasteel. That road is wide enough (6m surface and 15-20m servitude). From the existing Sonquasdrift Road to the abstraction / pump station site there may be small watercourses to cross (depending on which of the three possible access routes on Goudklip Farm are selected).
- The on-farm roads will have required widening and wearing courses – conceptual designs not available yet.

6.1 Physical infrastructure

The purpose of the physical infrastructure is to ensure that the capacity of the Voëlvlei Dam, which never reaches full capacity, is maintained. The physical infrastructure of this project has both social and economic implications on both a local and regional scale.

The project will ensure water security for all users of the Voëlvlei Dam and the Berg River. On a regional scale, this will allow continued domestic, agricultural and commercial use of water without disruption.

Locally, directly affected farmers and downstream users of the Berg River will have water security, allowing for the continued abstraction of water during the summer months. Water security allows for sustained agricultural activities to take place. In an area where agriculture is the dominant sector, it is critical that the industry is supported. The West Coast DM SDF states that agriculture is considered the primary economic growth sector in majority of the town in the district. This project therefore is directly part of the districts mandate to provide water to communities and industries for continued support of agricultural activity.

The infrastructure does however bear some burden on farmers, though the impact may be small. The access roads will alter the land use as arable land will be lost to create access. Additionally, structures such as pump stations cannot be erected within the infrastructure servitude area. Thus, there will be alteration of land use and a loss of arable land to lay down the required infrastructure.

In terms of water quality, the infrastructure will allow for greater mixing of water, thereby improving the water quality of the Berg River. This means that farmers will abstract cleaner water from a river which has a stigma for the poor quality of water. Improved water quality will improve the quality of crops and improve agricultural practices.

Additionally, the improved water quality will improve the river health system which has a public health impact. An improved river health system has a direct impact on the quality of water and fish consumed by humans, and places less strain on the health system as human health improves.

6.2 Sense of Place

Sense of place is a concept that is difficult to quantify. The concept is primarily used to describe the emotions experienced or the association made with a geographical location. Although it appears to be a subjective concept, an exploration of various definitions can begin to narrow the concept sufficiently for analysis.

Taun (1977) believed that a space or geographic location can gradually move from being otherwise undifferentiated from other spaces into a unique location through the build-up of

emotion associated with that place. In this process the place begins to be assigned emotional value.

With this background two definitions are offered for sense of place, those of Stokes, Watson, and Mastran, (1997) and of Ryden (1993). Stokes et al believe sense of place is.

“Those things that add up to a feeling that a community is a special place, distinct from anywhere else”

Whilst Ryden is of the view that sense of place results from:

“... gradually and unconsciously ... inhabiting a landscape over time, becoming familiar with its physical properties, accruing history within its confines.”

From these definitions is it clear that sense of place covers the aspects of a place that has emotional meaning to the inhabitants. These may range from the physical environment, the climate, the layout of the streets, location of the commercial centres, a particular lifestyle, the friends and neighbours that develop over time and a sense of shared history. This shared history would develop through informal folklore and personal narrative, not through official histories. In this respect the defining of a sense of place is best left to a long term resident who is intimate with the history and culture associated with the place in question.

Owing to the nature of the above definitions, which rely on an emotional and human response to a geographic area, it is likely that the sense of place will differ according to experiences of the place. As people have different experiences of the place, so will the sense of place differ. This variation in response to a place adds a further level of complexity to an already difficult concept.

From the above discussion, a definition of the sense of place to be used for the purposes of the study can be derived. At the outset, it should be stated that the concept should be defined according to the dominant socio-cultural group inhabiting the geographic area. In the case of study area; the study area has a mix of income groups as the farmers are middle income and the low-income communities who works there. The sense of place in these areas can be said to have the following components:

- The location of the surrounding communities
The study area is situated in Drakenstien LM and and Swartland LM. It falls outside the urban edge. The dominant land use agriculture and tourism. The Voëlvlei dam, the Bergriver and Limietberg mountains has attracted a tourism industry.
- The physical environment; including the natural environment

The proposed area is used for residential and commercial farming. There is both economic and social value placed on the land, thus the ecological value to the land is important. The area is not built up and is rural in nature.

- The layout of the streets; locations; and infrastructure in relation to the residential areas
The area is formalised with a road rural network. The R44 and R46 serve as the main roads that traverses through the area connecting the site to the City of Cape Town, Paarl and other towns within the Western Cape Province.
Internal road networks are gravel based on the rural – like nature of the area. The internal roads are primarily used by residents of the area and connect farms.
- The socio-economic characteristics of the inhabitants
The site area is dominated by commercial farming activity. These farms are aesthetically pleasing and have a high reliance on Berg River for water supply. The community are long term residents with a shared history of the area. There is an aging population. While living in largely formalised areas, the communities in the study area are rural, live in poverty and remain unskilled
- The sense of instability in the various facets of the study area
The area is isolated and rural in nature. It is characterised by high levels of poverty and low education levels. Unemployment is high and there are limited economic opportunities available given the rural environment.

Mitigation measures and monitoring of sense of place on its own is difficult. The impact on Sense of Place is derived from a large number of variables. In this context, the mitigation measures for sense of place take place through education; employment and other forms.

6.3 Job Creation and Skills Development

It is anticipated that there will be a positive impact on job creation during the construction phase. The construction itself will generate temporary employment as workers will be required. Potential secondary employment impacts can result as small business employs more persons to sell goods to labourers during the construction phase.

It is anticipated that the operation phase will not give rise to employment or skills development opportunities. DWS have staff quarters on the dam and it is assumed that the current staff base will maintain the project infrastructure as it is not extensive.

Employment is a sensitive issue and this project has the potential to positively impact upon the skills levels during the construction phase. However, low levels of education stunt the employment of local job seekers. Education affects the employability of an individual.

Education levels also indicate the level of skill one may have and the degree to which one can be skilled. In a study area where only fifteen percent of the population over age 20 have

matriculated or attained higher education, it is not likely that many people are skilled and highly skilled.

Attempts to break the poverty cycle of the area require more than secondary school education. Higher education or further skills training is required. Thus, it is important that the community under-go's skills development where possible

Local employment should be encouraged to reduce the unemployment rate in the area. Furthermore, the local community will be able to benefit from a project that directly affects them.

DWS must monitor the employment process at all times. Employment audits should be conducted and there should be full transparency of the process. It is important that women are also provided employment opportunities. Audits should pay attention to the employment process of women to ensure that exploitation does not take place.

Given the concerns by stakeholders that the CLO process is disruptive and inefficient to the project, DWS should manage the employment process in an alternative manner. However, it must be ensuring that the new method of employment does not disturb the implementation of the project or conflict with the law.

6.4 Construction activity

The construction phase will commence once the environmental and other approvals are authorised. The construction activity will impact the social environment both positively and negatively. Given the quiet pristine nature of the project area, construction activity is likely to cause a number of social nuisances as well as economic implications on the communities and farming activities.

6.4.1 SMME Development

The proposed development has the potential to create a number of job opportunities for existing and new local SMMEs. These range from site clearing, to fencing and construction, as well the supply of materials. There are also opportunities existing for community members to provide catering, accommodation and other services to the new workers.

Should these opportunities be realised the impact will be quite significant. Since these are local SMMEs, the profits generated will stay in the area raising the economic activity and increasing welfare. There is also potential for skills upgrade and further employment. In South Africa, most employment is generated through small and medium business. Given the size of the proposed project, it is unlikely that the contracts will be for a very long, however they can make a difference given the low levels of income in the wards.

SMME opportunities should be provided to everyone on an equal basis. Where possible, DWS should support and encourage the development of SMMEs and local or regional suppliers. Where possible, procurement should come from local or regional business so that the profits stay in the area, increasing economic activity.

6.4.2 Induced Migration

In a country facing high unemployment, there is a tendency for migration to areas of job opportunity. The migration is largely male dominated as people search of jobs and better living standards. Migration causes an imbalance in host community as there is a rise in the working male population compared to females of a working age.

It is unlikely that a project of this nature will lead to uncontrolled migration in the area, however in rural areas, even a small increase in the number of people can cause strain on infrastructure and disrupt social networks.

Migration can affect the host community in a number of ward. Firstly, more people are competing for the same jobs. This creates tension between the migrant community and the host community.

Not all job seekers entering the area will be employed, leaving a new population of idle workers in the area. Idleness and frustration of not finding work can result in a large number of social ills included crime; alcohol abuse and disturbance to the local community and community structure.

To mitigate the low numbers of available male workers, the proposed project should try increase the local workforce through employing women. This would lead to increases in the number of women working, which is low in the area. Also, this will affect the gender power distribution, providing women with more bargaining power in the households due to the reliance on their income.

The population in the study area is characterised by low education and skills level as shown in Section 5.2 where fifty percent of the population over 20 years of age are considered functionally illiterate. This decreases the employability of the population in the study area. Thus it will be necessary to rely on imported labour to fill the employment gap. Due the need of imported labour, there is expected to be influx of workers in the study area.

6.4.3 Impact on Road Conditions

Heavy duty trucks and construction vehicles will cause damage to the current road conditions as well as contribute to congestion on the roads.

The greater the number of trucks on the road, the greater the risk of road accidents occurring. It is important that the contractors are sensitive to the road conditions and ensure that

throughout the construction process that these roads are maintained and suitable for small vehicles.

Care should be taken to ensure that construction vehicles do not disturb sensitive crops. The EMPr must have a traffic plan to ensure vehicles avoid these areas.

6.4.4 Safety and Access Control

The construction phase will likely result in a restriction of access across the length of the pipeline corridor. This impact will be temporary in nature and may impact farmers and arable land. Mitigation measures recommended should ensure limited disruption to the landowners as well as ensure strict access control on private property.

6.4.5 Crime and Security

An increase in the risk of criminal activity due to additional traffic along the route as well a potential increase of job seekers in the area may arise during the construction phase. This risk is likely to decrease during the operation phase again.

Mitigation measures that apply include limiting access control, ensuring access gates are used and ensuring the safety of landowners and construction staff.

DSW can work with the local structures such as the local police and community organisations to monitor changes in crime during the construction phase

The South African legislation makes allowance for the establishment of Community Policing Forums where necessary. Where they do not exist in the affected areas the contractor should assist with facilitating the establishment of these forums.

6.4.6 Disturbance of Cultural, Spiritual and Religious Sites

The proposed infrastructure could impact physically on areas of cultural, traditional or religious significance and/or could interfere with access to these sites. As part of the EIA process a heritage impact assessment (HIA) was undertaken for the project. The HIA concluded that the proposed development will have low impacts on the heritage resources of the area and that it is recommended that the development may proceed. Mitigation measures as per the specialist study should apply.

6.4.7 Dust and Pollutants

During the construction phase, dust and various air born pollutants will be emitted from the use of machinery and equipment. During the operational phase vehicle traffic is also likely to contribute to the general overall exhaust emissions.

Dust not only impacts human and livestock health through inhalation, but it also bears on impact on the growth of crops. It is important that that dust suppression methods apply in

consultation with landowners and best practice to minimise the impact on humans, livestock and crops.

6.4.8 Impact on Health

An influx of workers is often characterised by higher health risks and social issues, particularly if the influx is male dominated. These include a higher disease burden and rise in HIV/AIDS rates, pressures on food and water security.

In terms of social insecurity, the increase in the local population may require an increase in policing. There should also be awareness and education campaigns on health and social risks such as HIV/AIDS and crime prevention. These programs should aim to gather support from the traditional authorities and local government to ensure that social problems that could arise can be resolved as early as possible.

The livelihood of workers into the area should be monitored. Hostels areas should be avoided and where possible, there should be provision made for families of employed workers during the construction phase.

Dust from trucks may impact those with lung problems such as asthma. The gravel on the R344 road will provide access to the project site will be a significant dust contributor as heavy duty construction trucks make use of the road. It is recommended that the road is tarred to mitigate against the dust levels.

The health and safety of workers must be ensured. During the construction phase, Health and Safety regulations must be adhered to. During the operational phase, workers must be provided with appropriate Personal Protection Equipment to avoid contact with toxic waste.

The impacts of construction can affect the health and safety of those working on the construction site; disturbance, health and income of the host communities; and disturbance to the environment and animals. These impacts can be mitigated for in the Environmental Management Programme and through adherence to the Occupational Health and Safety Act 85 of 1993.

7 IMPACT ASSESSMENT

The following definitions apply:

Nature	The project could have a positive, negative or neutral impact on the environment.
Extent	Local – extend to the site and its immediate surroundings. Regional – impact on the region but within the province. National – impact on an interprovincial scale. International – impact outside of South Africa.
Magnitude	Degree to which impact may cause irreplaceable loss of resources: Low – natural and social functions and processes are not affected or minimally affected. Medium – affected environment is notably altered; natural and social functions and processes continue albeit in a modified way. High – natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.
Duration	Short term – 0-5 years. Medium term – 5-11 years. Long term – impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention. Permanent – mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability	Almost certain – the event is expected to occur in most circumstances. Likely – the event will probably occur in most circumstances. Moderate – the event should occur at some time. Unlikely – the event could occur at some time. Rare/Remote – the event may occur only in exceptional circumstances.
Significance	Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows- 0 – Impact will not affect the environment. No mitigation necessary. 1 – No impact after mitigation. 2 – Residual impact after mitigation. 3 – Impact cannot be mitigated.
Mitigation	Information on the impacts together with literature from social science journals, case studies and field work will be used to provide mitigation recommendations to ensure that any negative impacts are decreased and positive benefits are enhanced.
Monitoring	Monitoring usually involves developing and implementing a monitoring programme to identify deviations from the proposed action and to manage any negative impacts. The recommended mitigation measures will also include monitoring measures.

7.1 Impact on the Economy

Environmental Feature		Impact on the Economy				
Project life-cycle		Pre-Construction phase, Construction Phase, Operational Phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
Water Security		<ul style="list-style-type: none"> The augmentation of water will ensure water security for all water users. Maintenance of the project infrastructure is critical to ensure that there is no disruption of water supply as this will have economic implications on the project. 				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Positive	Regional	High	Permanent	Likely	3
After Mitigation	Positive	Regional	High	Permanent	Likely	3
Agricultural impact		<ul style="list-style-type: none"> Directly affected farmers may experience a loss of agricultural land due to the construction of access roads. Farmers and landowners must be consulted in the design of the road to ensure that there is minimal impact on landowners. 				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Positive	Local	Low	Short Term	Likely	1
After Mitigation	Positive	Regional	High	Permanent	Likely	3

7.2 Impact on Infrastructure

Environmental Feature		Impact on Infrastructure				
Project life-cycle		Pre-Construction Phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
Access		<ul style="list-style-type: none"> Internal access routes expose the farmers to safety and security risks. Farms may choose to negotiated mitigation measures such as access gates to mitigate against the loss the livestock, damage to property and safety. The EMPr must enforce strict access control measures. 				
Land use		<ul style="list-style-type: none"> It is noted that the aquatic study stated that flooding and loss of water infrastructure on farms, caused as a result of the project infrastructure is not likely, however is of great concern to landowners. In order to mitigate against this a survey should be undertaken to document all pump stations and infrastructure that may be lost during the event of a flood. The survey should account for directly affected properties as well as downstream users. In the event of flooding, the survey should be used a basis for compensation claims against the project proponent. 				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Long term	Almost Certain	3
After Mitigation	Negative	Local	Low	Long term	Almost Certain	2

7.3 Construction Impacts

Environmental Feature	Construction Impacts
Project life-cycle	Construction Phase
Potential Impact	Proposed Management Objectives / Mitigation Measures
Skills transfer	<ul style="list-style-type: none"> • DWS must develop a skills development program for the duration of the construction activity. • Beneficiaries of educational programs should be residents who live close to the project area. • The selection process should be transparent. • In order to increase the size of local employment, women should also be employed in the construction phase.
Increased employment	<ul style="list-style-type: none"> • Preferential treatment to local job seekers before employing labour from outside. • One hundred percent of unskilled employment during the construction phase should come from local labourers who live in the study area. • In order to increase the size of local employment, women should also be employed in the construction phase. • The selection process should be transparent. • Where possible, labour intensive methods should be used. • In order to increase the size of local employment, women should also be employed in the construction phase.
Impact on SMMEs	<ul style="list-style-type: none"> • Construction and other materials to be sourced from local suppliers to boost the regional economic and drive the creation of more sustainable jobs. • SMME opportunities should be provided to everyone on an equal basis. Where possible, DWS should support and encourage the development of SMMEs and local or regional suppliers. • Where possible, procurement should come from local and regional business so that the profits stay in the area, increasing economic activity. • DWS should make use of existing council structures to identify beneficiaries of the program.
Impact on Traffic	<ul style="list-style-type: none"> • Ensure that the necessary signage and traffic measures are implemented for safe and convenient access to the site. • Measures must also be put in place to ensure that these roads and any access points do not get built up with mud or sand. • Construction machinery drivers are to travel at appropriate speeds and have flashing lights attached to the roofs of the vehicles. • Applicable speed limits as set on regional roads must be observed at all times. • The number of vehicles present on site must be limited to the minimum.
Impact on Access	<ul style="list-style-type: none"> • Access to the farmer's private land during construction must be controlled. An access control plan should be developed and must form part of the EMP. Landowners must be afforded the opportunity to comment on the plan. Contractors and sub-contractors must be forced to comply with the plan.

Environmental Feature	Construction Impacts					
Project life-cycle	Construction Phase					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
	<ul style="list-style-type: none"> Where necessary crossing points should be designed and sufficiently distributed for use of farmers and livestock if necessary. Crossing pointed should be planned with local authorities and landowners. 					
Increase in Dust	<ul style="list-style-type: none"> Dust and disturbance can be mitigated through the use of appropriate dust suppression mechanisms. Where sensitive crops are affected by dust, DWS should conduct a feasibility study to tar the roads. Mitigation measures management should be adhered to according the relevant specialist studies. The contractor must maintain the roads on an on-going basis to ensure that there is minimal dust from construction vehicles. 					
Induced Migration	<ul style="list-style-type: none"> DWS must make a public announcement that imported labour will not take place on the project. Contractors and sub-contractors must have strict conditions that prevent the importing of semi and unskilled labour without prior justification and approval Unless absolutely necessary, accommodation facilities should be avoided. Rather, facilities in Gouda should be made use of. Employment of females and youth is encouraged to ensure the empowerment of the most vulnerable to unemployment and poverty. 					
Safety and security	<ul style="list-style-type: none"> Erect signage and fences to deter theft. EMPr must have a safety plan to ensure the protection of humans and livestock. Farmers must be provided an opportunity to proposed mitigation measures. 					
Impact on Cultural Beliefs	<ul style="list-style-type: none"> Mitigation as per the relevant specialist studies apply. 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Short Term	Almost Certain	3
After Mitigation	Negative	Local	Low	Short Term	Almost Certain	2

7.4 Assessment of alternatives

Table 9: Assessment of alternatives

Project Component	Alternatives	Preferences	Comment
Rising main pipeline and associated Discharge Points from the Berg River to Voëlvlei Dam	Alternative 1: Northern Discharge Point = 8 115 m	✘	This is the least preferred route as the discharge point may be a nuisance factor to recreational facilities on the dam. It is however not a fatal flaw should this route be considered. Additionally, on a cost basis, this route will be the most expensive given the length of the pipeline.
	Alternative 2: Central Discharge Point = 5 000 m	✔	The pipeline route is the shortest, requiring less loss of arable land and disturbance to current activities surrounding the dam. It is therefore also the least costly option. However, the discharge point is located in close proximity to the staff houses and therefore there will be anticipated nuisance impact during construction and potentially during the operation of the scheme.
	Alternative 3: Southern Discharge Point = 6 300 m	✔	This route is slightly longer than alternative 2 and therefore costing more. However, as it is further away from the DWS staff houses, the route will have less of an impact on the community.
Access Roads	Alternative 1:	✔	This 6.7kilometer route follows an existing unnamed farm route. The construction of only 300 meters of road is required.
	Alternative 2:	✘	This route requires the construction of 2.3 kilometres of road on land used for agricultural purposes. This route will cut through farming activity and therefore it is not recommended that this route is constructed.

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Project Component	Alternatives	Preferences	Comment
Site laydown areas	Alternative 1: At discharge point of pipeline alternative 2	✘	The proposed laydown area is approximately 200 meters away from the DWS staff houses and therefore is the least preferred alternative.
	Alternative 2: At discharge point of pipeline alternative 2	✔	Situated 200m from DWS staff houses, this alternative will have less nuisance for the residents and it is therefore the preferred laydown area.
	Main site laydown area	N/A	

8 CONCLUSION

The West Coast DM is confronted by an increased demand for water. It is more difficult to address these demands efficiently due to capacity constraints in the existing distribution schemes and water sources. The Department of Water and Sanitation (DSW) identified the need for augmentation of the Western Cape Water Supply System (WCWSS) by 2019. The Berg River-Voëlvllei Augmentation Scheme, which forms part of the WCWSS was therefore commissioned to transfer approximately 23 million m³ per annum from the Berg River to the existing Voëlvllei Dam.

The Berg River-Voëlvllei Augmentation Scheme project area is situated in Western Cape in the Drakenstein Local Municipality (LM) of the Cape Winelands DMs as well as the Swartland LM of the West Coast DM (**Figure 1**). The project components and related alternatives are discussed include the pipeline, abstraction works; Rising main pipeline and pump station; Diversion weir; construction access roads and construction camp (**Figure 2**) (**Table 1**).

The project is located in a rural area where agriculture is the primary sector. In recognition of this, local government plans such as the IDPs have identified the need to support the industry. The support of the industry not only affected the commercial viability of the industry but also the livelihoods of those dependent on the sector for an income.

The socio-economic conditions of the surrounding town to the project are characteristic of rural communities in South Africa. These communities are poor, largely unskilled and have limited access to economic opportunities. Rather, migration to urban centres is required.

The project will improve access to cleaner water for the users of the Berg River, allowing for sustained provision of domestic and commercial water. In this light, the project should continue.

9 REFERENCES

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