THE PROPOSED UPGRADES TO THE BULK WATER SUPPLY FOR KAKAMAS ACROSS VARIOUS PROPERTIES IN KAKAMAS AND THE SURROUNDING VILLAGES



DRAFT BASIC ASSESSMENT REPORT

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(Volume)

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Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of 07 April 2017. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	~~YES~~	**NO**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. ACTIVITY DESCRIPTION

a) Describe the project associated with the listed activities applied for

The proposed Kakamas Bulk Water Supply includes *inter alia* the construction of the following infrastructure:

- New Orange River Raw Water Abstraction Pump Station (120 liters per second) located 50m downstream of the existing railway bridge.
- New 450mm diameter uPVC Raw Water Rising Main pipe x 3 300m from Raw Water Pump Station to the proposed new Kakamas Water Purification Plant .
- New Kakamas Water Purification Plant with treatment capacity of 10 500m^3/day.
- A new 315mm diameter uPVC Class 9 Rising Main x 1 150m from new Kakamas Water Purification Plant to the existing Kliprand Reservoir.
- A new 250mm diameter Class 9 uPVC Rising Main x 1 903m from the new Kakamas Water Purification Plant to the existing Langverwag Reservoir.
- A new 160mm uPVC Class 9 diameter Rising Main x 2 150m from the new Kakamas Water Purification Plant to the new Kakamas East Reservoir.
- New 725 kiloliter reinforced concrete Kakamas East Reservoir.
- Upgrade of the mechanical and electrical infrastructure at the existing Kliprand Hi-Lift Pump Station and the existing Langverwag Hi- Lift Pump Station.
- Construction of a new 20 Megaliter Storage Reservoir at Rhenosterkop.
- Construction of a 350mm diameter pipeline x 1 200m from Kakamas Water Purification Plant to the new 20 Megaliter Reservoir
- New uPVC bulk connector pipes to each village's reservoir (Alheit Reservoir, Marchand Reservoir, Augrabies Reservoir): total pipe length of 6.80km (1.15km x 315mm diameter to new Rhenosterkop Reservoir, 1.70km to Alheit and Marchand Reservoirs, 3.45km to Augrabies Reservoir).
- Augrabies Bulk Supply pipeline from new Rhenosterkop Reservoir to Farm No.15 Rooipad 36km x 250mm diameter reducing to 160mm diameter pipe.
- Schroder Bulk Supply pipeline from the new Kakamas Water Purification Plant over the Orange River using the existing railway bridge to cross: 11.32km x 200mm diameter reducing to 110mm diameter pipe.
- Lutzburg Bulk Supply pipeline from Orange River railway bridge to Farm No.474 Baviaanz Krantz: 3.87km x 160mm diameter pipe.
- Kakamas East Bulk Supply pipeline from new Kakamas Water Purification Plant to the R359 at Kakamas South Settlement Erf 431: 9.40km x 125mm diameter pipe.
- New 22kV Electrical Power Supply Line x 3.95km from Kakamas Substation to the new River Abstraction Pump Station site.
- New Electrical Power Supply Line x 1.0km from Kakamas Substation to the new Kakamas Water Purification Plant.
- New high speed Radio Telemetry System to help control River Abstraction Pump Station and Reservoir Levels.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listing Notice 1 (GN327)	Description of project activity
Activity 9, *"The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or* *(b) where such development will occur within an urban area*".	The proposed development requires that a pipeline of more than 1000m for the bulk transportation of water be installed and the internal diameter of the pipeline exceeds 0.36m. In addition, the location of the proposed pipeline is partly outside of the urban area.
Activity 12, *"The development of;* *(iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size;* *(xii) infrastructure or structures with a physical footprint of 100 square metres or more;* *where such development occurs;* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;* *— excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in Activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads, road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be*	The proposed development includes infrastructure with a total development footprint bigger than 100m^2 within 32m of some watercourses.

removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared".	
Item 13 *"The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014".*	The total capacity of all the proposed reservoirs exceeds 50 000m^3
Activity 19, *"The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse"*	The proposed development includes excavation and moving of more than 10m^3 of material within 32m of some watercourses.
Activity 27, *"The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan*"	The proposed development includes a pumpstation, reservoirs and a Water Purification Plant whose total development footprint exceeds 1ha
Activity 28, *"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes*".	The establishment of the proposed Water Purification Plant requires that more than 1ha and less than 20ha of indigenous vegetation be cleared on land zoned Agriculture
Listing Notice 3 (GN324)	**Description of project activity**
Item 3 *"The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.* ***g. Northern Cape*** *I. In an estuary;* *II. In a protected area identified in terms of NEMPAA, excluding conservancies;* *iii. Outside urban areas, in:*	The total capacity of the proposed reservoirs exceeds 250m^3 within a CBA located outside an urban area

a) National Protected Area Expansion Strategy Focus areas; *b) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *c) Sites or areas identified in terms of an International Convention;* *d) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *e) Core areas in biosphere reserves;* *f) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;* *g) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined".*	
Activity 12 "*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* ***g. Northern Cape*** *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within critical biodiversity areas identified in bioregional plans;* *iii. Within the littoral active zone or 100 metres inland from high-water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or* *iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning*".	The proposed development requires that more than 300m^2 of indigenous vegetation be cleared from some areas identified as a Critical Biodiversity Area.
Activity *14*, *"The development*	The proposed development requires that infrastructure exceeding 10m^2 in size be

of— *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or* *(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* ***g. Northern Cape*** *"i. In an estuary;* *ii. Outside urban areas:* *(aa) A protected area identified in terms of NEMPAA, excluding conservancies;* *(bb) National Protected Area Expansion Strategy Focus areas;* *(cc) World Heritage Sites;* *(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(ee) Sites or areas identified in terms of an international convention;* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *(gg) Core areas in biosphere reserves;* *(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;* *(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or* *ii. Inside urban areas:* *(aa) Areas zoned for use as public open space;* *(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or*	established outside the urban area and within 32m of some watercourses

(cc) Areas seawards of the development setback line".	

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014.Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Alternative 2 (Least preferred alternative)		
The least preferred site for the proposed Bulk Water Supply ("BWS") is located on both the southern side and the northern side of the Orange River and traverses various erven and farms in Kakamas and the nearby surrounding villages. This site alternative entails the pipeline that conveys potable water to the Augrabies Village extending from the Kakamas Water Purification Plant ("WPP") to southwards of most of the landuses that exist southwards of the Orange River in the Kakamas South Settlement. Please refer to the red line on the locality map attached hereto as Appendix A1.1 and the associated coordinates in Appendix A1.2.	Lat (DDMMSS)	Long (DDMMSS)

Alternative 1 (Preferred Alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
The Preferred Site for the BWS is also located on both the southern side and the northern side of the Orange River and traverses various erven and farms in Kakamas and the nearby surrounding villages. However, this alternative entails the pipeline that conveys potable water to the Augrabies Village extending northwards from the Kakamas WPP to within the road reserve of the N14 National Road. The pipeline then branches off into the road reserve of the R359 Regional Road and continues westwards within the road reserve on its way to the Augrabies Village and to the farming areas located further to the west. The other parts of the proposed site for the BWS are identical to those described for the less preferred alternative. Please refer to the light blue line on the locality map attached hereto as Appendix A1.1 and the associated coordinates in Appendix A1.2.		
Alternative 3 (Less preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
The less preferred site for the proposed Bulk Water Supply ("BWS") is located on both the southern side and the northern side of the Orange River as well and traverses various erven and farms in Kakamas and the nearby surrounding villages. However, this alternative entails the pipeline that conveys potable water to the Augrabies Village extending northwards from the Kakamas WPP to Truter Road East. The pipeline then extends westwards along the edge of Truter Road and crosses a tributary of the Orange River before continuing to extend along the edge of Truter Road West on the other side of the tributary before ultimately extending southwards to the R359 Regional Road. The pipeline continues westwards within the road reserve of the R359 Regional Road to the farming areas located further to the west. The other parts of the proposed site for the BWS are identical to those described for the Preferred Alternative as well as the less preferred alternative. Please refer to the orange line on the locality map attached hereto as Appendix A1.1 and as well as the associated coordinates in Appendix A1.2.		

In the case of linear activities:

Alternative:

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity
- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity
- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the layout map provided in Appendix A of this form.

b) Layout alternatives

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Alternative 1 (Preferred Alternative)		
Please refer to the description of the proposed development in Section 1 above as well as the description of the Preferred Alternative. Please also refer to Appendix A1.1 and the associated coordinates in Appendix A1.2	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2 (Least) preferred alternative)		
Please refer to the description of the proposed development in Section 1 above and refer to Appendix A1.1 as well as the associated coordinates in Appendix A1.2	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Please refer to the description of the proposed development in Section 1 above and refer to Appendix A1.1 and the associated coordinates in Appendix A1.2	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
The technology alternative employed is the usage of gravitation where the slope of the land allows for water to flow downhill to the delivery point. It is only when a delivery point is located upslope that the water will be moved by usage of an electric pump. This alternative helps in keeping the cost of electricity for pumping water to delivery points as low as possible. In addition, horizontal directional drilling is a technology alternative that was considered for enabling the pipelines of the proposed upgraded BWS to traverse watercourses significantly deeper underground than the bed of the watercourse so that watercourses are crossed with minimal disturbance. This technology alternative is included as a recommendation in the Freshwater Study Report. However, the bedrock in the Northern Cape is typically shallow and the common rock formations in the area such as dolerite, granite and calcrete if encountered, will make horizontal directional drilling infeasible. Horizontal directional drilling will therefore not be used and it is open trench excavations followed by rehabilitation will be used instead.
Alternative 2
Alternative 3

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)		
N/A		
Alternative 2		
Alternative 3		

e) No-go alternative

This would mean that the BWS for Kakamas and the nearby surrounding villages and farms would be abandoned, and the proposed site would remain in its current state.

The BWS for Kakamas and the nearby surrounding villages was last upgraded in 1987 and the population of Kakamas and its associated surrounding villages has grown significantly since then. The water demand outstrips the potable water supply to the extent that the residents of Kakamas and the surrounding nearby villages frequently endure up to three days at a time without any piped municipal potable water. The BWS therefore requires an upgrading in order for the water supply needs of the area to be met at present and well into the future. In addition, the state of the BWS has deteriorated over the decades such that lots of potable water is lost via leaks and some of the water purification equipment tends to malfunction. A great need therefore now exists for the current BWS to be upgraded

The ‘no-go’ alternative is clearly undesirable, when considering that authorising the Preferred alternative or less preferred alternative will make it possible for the Kai !Garib Local Municipality to meet the potable water supply needs of the community of Kakamas and the nearby surrounding villages with the potential negative impacts of the proposed development remaining Medium to Low.

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[1] (preferred activity alternative)	Approximately 115 000m^2
Alternative A2 (if any)	Approximately 109 000m^2
Alternative A3 (if any)	Approximately 100 000m^2

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	m
Alternative A2 (if any)	m
Alternative A3 (if any)	m

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

4. SITE ACCESS

Does ready access to the site exist?	**YES**	~~NO~~
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

Access will be gained via existing roads in Kakamas and the nearby surrounding villages. No new access roads are required.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

[1] "Alternative A.." refer to activity, process, technology or other alternatives.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	~~YES~~	**NO**	Please explain
The pipelines only require that a servitude be registered on the proposed site. However, the reservoirs, pumphouse and water purification plant may require permission in terms of land use management legislation.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	**YES**	~~NO~~	Please explain
The proposed upgrade to the current BWS is a project that is too small to have any kind of significant bearing on the PSDF			
(b) Urban edge / Edge of Built environment for the area	**YES**	~~NO~~	Please explain
The proposed upgrade to the BWS has no bearing on the urban edge.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	**YES**	~~NO~~	Please explain
The Kai !Garib Local Municipality is the Applicant			
(d) Approved Structure Plan of the Municipality	**YES**	~~NO~~	Please explain
The Kai !Garib Local Municipality is the Applicant			

(e) An Environmental Management Framework (EMF) adopted by the Department (*e.g.* Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	**YES**	~~NO~~	Please explain
No EMF is known to exist for the area			
(f) Any other Plans (e.g. Guide Plan)	**YES**	~~NO~~	Please explain
The Kai !Garib Local Municipality is the Applicant			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	**YES**	~~NO~~	Please explain
The Kai !Garib Local Municipality is the Applicant. The BWS for Kakamas and the nearby surrounding villages was last upgraded in 1987 and the population of Kakamas and its associated surrounding villages has grown significantly since then. The available water supply capacity is outstripped by the demand and it is common for residents of the area to remain without water for two to three days at a time. In addition, the state of the 39 years old BWS infrastructure has deteriorated over the decades, as the BWS infrastructure was designed in the 1980s to remain reliable for approximately 20 years. The water purification equipment is fraught with leaks and is increasingly prone to malfunctions. A great need therefore exists for the BWS to be upgraded in order that the current quality and quantity of the water supplied to Kakamas and the nearby surrounding villages and nearby commercial farms becomes adequate to meet the needs of the community at present and well into the future. In addition, the construction phase of the proposed upgrading of the BWS for Kakamas and nearby surrounding villages and commercial farms will yield socio-economic benefits by providing construction employment opportunities to residents of the local area, thereby alleviating the unemployment situation in the municipal area. In addition, construction material will as much as possible be sourced from suppliers in the local area and this will boost business in the area, thereby strengthening the local economy.			

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	**YES**	~~NO~~	Please explain
The BWS for Kakamas and the nearby surrounding villages was last upgraded in 1987 and the population of Kakamas and its associated surrounding villages has grown significantly since then. The available water supply capacity is outstripped by the demand and it is common for residents of the area to remain without water for two to three days at a time. In addition, the state of the 39 years old BWS infrastructure has deteriorated over the decades, as the BWS infrastructure was designed in the 1980s to remain reliable for approximately 20 years. The water purification equipment is fraught with leaks and is increasingly prone to malfunctions. A great need therefore exists for the BWS to be upgraded in order that the current quality and quantity of the water supplied to Kakamas and the nearby surrounding villages and nearby commercial farms becomes adequate to meet the needs of the community at present and well into the future. In addition, the construction phase of the proposed upgrading of the BWS for Kakamas and nearby surrounding villages and commercial farms will yield socio-economic benefits by providing construction employment opportunities to residents of the local area, thereby alleviating the unemployment situation in the municipal area. In addition, construction material will as much as possible be sourced from suppliers in the local area and this will boost business in the area, thereby strengthening the local economy.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain
The proposed development does not require any municipal services. In fact, the proposed BWS is an upgrade of the existing BWS of the municipality.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	**YES**	~~NO~~	Please explain
The Kai !Garib Local Municipality is itself the Applicant			
7. Is this project part of a national programme to address an issue of national concern or importance?	**YES**	~~NO~~	Please explain
The provision of basic services that include *inter alia*, adequate water supply is a national concern and a constitutional right.			

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	**YES**	~~NO~~	Please explain

The proposed site for the upgraded BWS is located close to the Orange River where the water to be purified is to be sourced and the town of Kakamas with its associated cluster of villages to be supplied with potable water is also close to the said river. This helps in avoidance of the higher financial costs and higher ecological disturbance associated with a BWS that extends great distances from the water source to where the water is required.

The preferred route for the pipeline that will deliver potable water to the Augrabies Village and commercial farming area located further west (Blue line on the Locality map, refers) is kept as much as possible within the road reserve of the N14 National Road and the R359 Regional Road. The potential environmental impacts of establishing the Augrabies pipeline along this preferred route will therefore remain largely contained within the said road reserves. This helps in avoidance of the higher levels of ecological disturbance that would have resulted if the pipeline to the Augrabies Village were to be established along the less preferred route (Red line on Locality map, refers).

In view of the above, the location of the proposed upgraded BWS wherein the Augrabies pipeline remains mostly within the road reserve is highly favourable.

9. Is the development the best practicable environmental option for this land/site?	**YES**	~~NO~~	Please explain

The Kai! Garib Local Municipality wishes to upgrade the BWS for Kakamas and the nearby surrounding villages where residents frequently endure up three days at a time without piped potable municipal water. The proposed upgrade to the BWS will significantly benefit the community of Kakamas and the nearby surrounding villages and commercial farms by helping to end the water supply shortages at present and well into the future.

In addition, the construction phase of the proposed BWS upgrade will yield socio-economic benefits by providing employment opportunities to local residents during the construction phase, thereby alleviating the unemployment situation in the municipal area. In addition, the merchandise for construction that will be sourced from the suppliers of building materials in the area will provide a boost to business in the area, thereby strengthening the local economy.

The proposed site for the upgraded BWS is close to the Orange River where the water to be purified is to be sourced and the town of Kakamas with its associated cluster of villages and commercial farms to be supplied with potable water is also close to the said river. This helps in the avoidance of the higher financial costs and higher ecological disturbance associated with a BWS that extends great distances from the water source to where the water is required.

The preferred route for the pipeline that will deliver potable water to the Augrabies Village and commercial farming area located further west (Blue line on the Locality map, refers) is kept as much as possible within the road reserve of the N14 National Road and the R359 Regional Road. The potential environmental impacts of establishing the Augrabies pipeline along the preferred route will therefore remain largely contained within the said road reserves. This helps in avoidance of the higher levels of ecological disturbance that would have resulted if the pipeline to the Augrabies Village were to be established along another route that is located less within road reserves as is the case with the less preferred alternative next to Truter Road and largely outside of the road reserve as is the case with the least preferred alternative (Red line on Locality map, refers).

The potential negative impact of the proposed upgrading of the existing BWS for Kakamas and its associated nearby villages on terrestrial biodiversity is of Medium significance and will decline to Medium-low upon the implementation of the recommended impact mitigation measures. This is confirmed in the Terrestrial Biodiversity Study Report attached hereto as Appendix D1. The potential negative impact of the proposed development on freshwater resources is low upon implementation of the recommended impact mitigation measures as is confirmed in the Freshwater Study Report attached hereto as Appendix D2. The potential negative impact of the proposed development on heritage-related resources is low upon the implementation of the recommended impact mitigation measures as confirmed in the Heritage Impact Study Report attached hereto as Appendix D3. The potential negative impact of the proposed development on agriculture is Low as confirmed in the Agricultural Compliance Statement attached hereto as Appendix D4.

In light of the significant socio-economic benefits of the proposed upgrading of the BWS for Kakamas and its associated cluster of villages, the Low to Medium potential negative impacts anticipated upon implementation of the mitigation measures contained in the EMPr, the proposed upgrading of the BWS on the proposed site is arguably the best practicable environmental option.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES**	~~NO~~	Please explain

Please refer to the answer given in Section 9 above

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	~~YES~~	**NO**	Please explain

The proposed upgrades to the BWS for Kakamas and its associated cluster of villages is intended to help end the potable municipal water supply cuts that the residents of the aforesaid areas frequently experience for up to three days at a time.

It is noteworthy that the proposed BWS is aimed at meeting the potable water supply needs of Kakamas and the surrounding nearby villages at present and well into the future and that applying for the required legal permits, establishing and then operating a BWS is very costly. In view of this, it is very unlikely that other organisations or individuals will consider the establishment of the proposed BWS as encouragement to each pursue their own BWS in the area.

12. Will any person's rights be negatively affected by the proposed activity/ies?	~~YES~~	**NO**	Please explain

The Kai !Garib Local Municipality wishes to establish an upgraded BWS for Kakamas and the nearby surrounding villages to help end the cuts in municipal potable water supply that residents of the area frequently face for two to three days at a time. The proposed upgrade to the BWS will significantly benefit the community of Kakamas and the nearby surrounding villages by helping to end the water supply shortages at present and well into the future. This is in keeping with the following constitutional right:

27. Health care, food, water and social security -
(1) Everyone has the right to have access to—
(a) health care services, including reproductive health care;
(b) sufficient food and water; and
(c) social security, including, if they are unable to support themselves and their dependants, appropriate social assistance.
(2) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights".

13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	~~YES~~	**NO**	Please explain

The Kai !Garib Local Municipality is the Applicant and the proposed upgrading of the BWS for Kakamas and the nearby surrounding villages has no bearing on the urban edge.

14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	~~YES~~	**NO**	Please explain

The proposed upgrading of the BWS is not included in the list of Strategic Infrastructure Projects.

15. What will the benefits be to society in general and to the local communities?	Please explain

The Kai! Garib Local Municipality wishes to upgrade the BWS for Kakamas and the nearby surrounding villages and commercial farms where residents frequently face cuts in the water supply that last up to three days at a time. The proposed upgrade to the BWS will significantly benefit the community of Kakamas and the nearby surrounding villages by helping to end the water supply shortages at present and well into the future.

In addition, the construction phase of the proposed BWS upgrade will yield socio-economic benefits by providing employment opportunities to local residents during the construction phase, thereby alleviating the unemployment situation in the municipal area. In addition, the merchandise for construction that will be sourced from the suppliers of building materials in the area will provide a boost to business in the area, thereby strengthening the local economy.

16. Any other need and desirability considerations related to the proposed activity?	Please explain
No. Please see above answer to Question 15.	

17. How does the project fit into the National Development Plan for 2030?	Please explain

The proposed upgrade to the BWS for Kakamas and the nearby surrounding villages aligns with *inter alia,* the following objectives that are contained in the National Development Plan for 2030[2]:

- Economy and Employment
    - The proposed BWS upgrade will provide socio-economic benefits by means of construction employment opportunities and by providing business to local suppliers of building materials in the during the construction phase. In addition, the proposed BWS upgrade will yield socio-economic benefits by providing *inter alia*, a water supply that is no longer typified by residents frequently enduring a lack of piped municipal water for two to three days at a time.

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

The general objectives of Integrated Environmental Management, namely, to promote sustainable development through the integration of social, economic and ecological considerations as well as the maintenance of inter- and intra-generational equity have been taken into account through the following:

- The actual and potential impacts of the proposed activity on the environment, socio-economic conditions, and cultural heritage, relative to the proposed site have been identified and evaluated. The proposed mitigation measures, with a view to minimising negative impacts on the environment, socio-economic conditions, and any cultural heritage, while maximising benefits and promoting compliance with the principles of environmental management, were assessed.
- The potential environmental impacts of the establishing the proposed upgrading of the BWS for Kakamas and the surrounding nearby villages have been identified, assessed and measures proposed to avoid or minimise the negative impacts.
- A public participation process that meets the minimum legal requirements has been followed for the Basic Assessment application to help ensure that the decision-making process takes into account the comments of members of the public and commenting authorities.

The environmental features of the proposed site have been considered and evaluated in the management and decision-making of the activity. An EMPr has been compiled (Appendix G, refers) for the proposed upgrading of the BWS and in the EMPr, the potential impacts with impact avoidance and mitigation measures to be adhered to during the implementation phase are specified.

[2]National Development Plan, 2030. Accessed at https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.
The principles of environmental management, as per Section 2 of the NEMA have been taken into account. The principles include: – **Socio-economic development**: People and their needs have been placed at the forefront while serving their physical, psychological, developmental, cultural, and social interests – the proposed upgrade to the BWS will provide employment opportunities for local residents and business opportunities for local entrepreneurs during the construction phase. This will help to alleviate the problem of poverty that is caused by unemployment in the administrative area of the Kai !Garib Local Municipality. – **Sustainable development**: Development must be socially, ecologically and economically sustainable. The potential negative environmental impacts associated with the proposed upgrade to the BWS are of Medium to Low significance as indicated by the terrestrial biodiversity specialist in the specialist report attached hereto as Appendix D1, freshwater specialist report attached hereto as Appendix D2, heritage impact specialist in the report attached hereto as Appendix D3 and Agricultural Compliance Statement attached hereto as Appendix D4. The recommendations contained in the specialist study reports are included in the EMPr and will be implemented to help ensure that the potential negative impacts identified in the said reports are avoided or minimised. The potential impacts of the proposed upgrade to the BWS will be minimised further through the implementation of the impact avoidance and mitigation measures contained in the EMPr (Appendix G, refers). In this way, the benefits associated with the proposed upgrade to the BWS that have been detailed in this Draft BAR will be kept outweighing the potential negative impacts. – **Transparent Public Participation Process:** The public participation process followed gives I&APs an opportunity to view and provide comment on the Draft BAR before the BAR is finalised and submitted to the competent authority. The decision of the competent authority will be forwarded to all I&APs so that whomsoever wishes to appeal the decision may appeal.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act (NEMA), Act No. 107 of 1998 and the Environmental Impact Assessment (EIA), Regulations of 2014 (as amended)	Applications for environmental authorisation must comply with the requirements specified in the NEMA and in the EIA Regulations	Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	
National Water Act	Water Use Licence	Department of Water and Sanitation	
Northern Cape Nature Conservation Act, Act 9 of 2009	NCNCA Protected plant species located on the site	Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	
National Heritage Resources Act (NHRA), Act 25 of 1999	A permit giving permission to develop is required according to Section 38(1) of the NHRA of 1999	South African Heritage Resources Agency (SAHRA)	

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	~~YES~~	**NO**
If YES, what estimated quantity will be produced per month?		m^3

How will the construction solid waste be disposed of (describe)?

The general solid waste generated during construction will be consolidated on site during construction and disposed of at the nearest suitability licensed waste disposal site.

Where will the construction solid waste be disposed of (describe)?

The general solid waste generated during construction will be consolidated on site during construction and disposed of at the nearest suitably licensed waste disposal site.

Will the activity produce solid waste during its operational phase?	~~YES~~	**NO**
If YES, what estimated quantity will be produced per month?		m^3

How will the solid waste be disposed of (describe)?

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?	~~YES~~	**NO**

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?	~~YES~~	**NO**

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	**NO**
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	~~YES~~	**NO**

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	~~YES~~	**NO**

If YES, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		**Cell:**	
E-mail:		**Fax:**	

Describe the measures that will be taken to ensure the optimal reuse or recycling of wastewater, if any:

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?	~~YES~~	**NO**
If YES, is it controlled by any legislation of any sphere of government?	YES	NO

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	~~YES~~	**NO**

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?	**YES**	~~NO~~
If YES, is it controlled by any legislation of any sphere of government?	YES	NO

Describe the noise in terms of type and level:

The construction phase of the proposed upgrading of the BWS is expected to produce noise comparable to the noise that prevails on most construction sites. The noise will be limited to normal working hours and will remain close to the road reserve where drowning out by the noise of regular road traffic is likely. This will help to keep the construction noise unlikely from reaching significant levels. Furthermore, potential noise-related impacts associated with the proposed upgrading of the BWS will be dealt with in the manner described in the EMPr.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

~~Municipal~~	~~Water board~~	~~Groundwater~~	**River,** ~~stream, dam or lake~~	~~Other~~	~~The activity will not use water~~

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	315 x 10^6 litres	
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	**YES**	~~NO~~

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

14. ENERGY EFFICIENCY

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

The proposed upgraded BWS will utilise gravitation as much as is possible to move water to where the water is required. This will assist in minimising the usage of electricity to pump the water upslope.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Please see above.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): [ ]

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? ~~YES~~ **NO**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Northern Cape
District Municipality	ZF Mgcawu District Municipality
Local Municipality	Kai !Garib Municipality
Ward Number(s)	
Farm name and number	Various properties and road reserves in Kakamas and the nearby surrounding villages
Portion number	
SG Code	

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

Agriculture and road reserve

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? **YES** ~~NO~~

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

Alternative S2 (if any):

Flat	1:50 – 1:20	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain	**X**
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain		2.9 Seafront	
2.10 At sea					

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:		**Alternative S2 (if any):**		**Alternative S3 (if any):**	
Shallow water table (less than 1.5m deep)	**YES**	~~NO~~	**YES**	~~NO~~	**YES**	NO
Dolomite, sinkhole or doline areas	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**
Seasonally wet soils (often close to water bodies)	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**
Unstable rocky slopes or steep slopes with loose soil	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**
Dispersive soils (soils that dissolve in water)	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**
Soils with high clay content (clay fraction more than 40%)	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**
Any other unstable soil or geological feature	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**
An area sensitive to erosion	~~YES~~	**NO**	~~YES~~	**NO**	~~YES~~	**NO**

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

~~Natural veld - good condition~~[E]	**Natural veld with scattered aliens**[E]	**Natural veld with heavy alien infestation**[E]	~~Veld dominated by alien species~~[E]	~~Gardens~~
~~Sport field~~	**Cultivated land**	~~Paved surface~~	~~Building or other structure~~	**Bare soil**

Please see Appendix B for Site Photographs and further descriptions of site vegetation.

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	**YES**	~~NO~~	UNSURE
Non-Perennial River	**YES**	~~NO~~	UNSURE
Permanent Wetland	**YES**	~~NO~~	UNSURE
Seasonal Wetland	~~YES~~	**NO**	UNSURE
Artificial Wetland	~~YES~~	**NO**	UNSURE
Estuarine / Lagoonal wetland	~~YES~~	**NO**	UNSURE

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The proposed site is within 32m of some of the typical non-perennial drainage lines and their tributaries that exist in most parts of the Northern Cape.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	~~Dam or reservoir~~	~~Polo fields~~
~~Low density residential~~	~~Hospital/medical centre~~	~~Filling station~~[H]
Medium density residential	~~School~~	~~Landfill or waste treatment site~~
~~High density residential~~	~~Tertiary education facility~~	~~Plantation~~
~~Informal residential~~	~~Church~~	**Agriculture**

~~Retail commercial & warehousing~~	~~Old age home~~	River, stream or wetland
~~Light industrial~~	~~Sewage treatment plant~~[A]	~~Nature conservation area~~
~~Medium industrial~~ [AN]	Train station or shunting yard [N]	~~Mountain, Koppie or ridge~~
~~Heavy industrial~~ [AN]	Railway line [N]	~~Museum~~
~~Power station~~	~~Major road (4 lanes or more)~~ [N]	~~Historical building~~
~~Office/consulting room~~	~~Airport~~ [N]	~~Protected Area~~
~~Military or police base/station/compound~~	~~Harbour~~	Graveyard
~~Spoil heap or slimes dam~~[A]	~~Sport facilities~~	~~Archaeological site~~
~~Quarry, sand or borrow pit~~	~~Golf course~~	~~Other land uses~~ (describe)

If any of the boxes marked with an "[N] "are ticked, how this impact will / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	**YES**	~~NO~~
Core area of a protected area?	~~YES~~	**NO**
Buffer area of a protected area?	~~YES~~	**NO**
Planned expansion area of an existing protected area?	~~YES~~	**NO**
Existing offset area associated with a previous Environmental Authorisation?	~~YES~~	**NO**
Buffer area of the SKA?	~~YES~~	**NO**

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	**YES**	~~NO~~

According to the Heritage Impact Assessment (Appendix D3 of the Draft BAR, refers), the following heritage resources exist on or close to the proposed site:

A railway bridge, constructed of metal and concrete, is located at coordinates (28º 45' 24.7″ S 20º 37' 12.2" E) near the Supply Line to WTP and forms part of the existing railway network. The bridge is older than 60 years. A new pump station is proposed to be constructed adjacent to the bridge, located just to the west of the existing structure. This resource is given a 'Local Protection B (Field Rating IIIB) and considered to be of medium significance. Destruction is not advised. A 10m buffer is recommended around the bridge at KSS/001.

- An old stone-walled house constructed from granite stones was identified. The structure consists of a single dwelling and is used for agricultural purposes. It is located at (28º 44' 26.3" S, 20º 33' 28.8" E) in close proximity to an existing farmhouse. This resource is given a 'General' Protection B (Field Rating IVB) and considered to be of medium significance. The site/resource should be recorded before destruction (medium significance). A 15m x 20m buffer zone is recommended. Alternatively, a destruction permit can be obtained from NBKB (Northern Cape Provincial Heritage Authority).

A total of four cemeteries were identified. Each cemetery contains a variety of headstones, generally aligned east–west. The cemeteries at KSS/176/004 and KSS/1500/F/19/006 each cover approximately 2 hectares, while KSS/399/19/007 extends over roughly 3 hectares, and KSS/1181/008 over approximately 4 hectares. All four cemeteries are established municipal burial grounds.

All graves are considered to be of high significance and should be mitigated. These cemeteries are given a 'Local Grade Protection' (Field Rating IIIA) and are of local importance and worthy of conservation.

o The cemetery at KSS/1500/F/19/006 is located approximately 10 m north of an existing road and the proposed Augrabies main supply line. A 15 x 30 m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection.
o The cemetery at KSS/1181/008 is located approximately 11 m south of an existing road. A 20m x 25m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection.
o The cemetery at KSS/176/004 is located approximately 65 m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50 m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection.
o The cemetery at KSS/399/19/007 is located approximately 107m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50 m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection.

The cemeteries should be demarcated and avoided by personnel and equipment. Gravesites should remain accessible to all descendants and family members during all phases of the project. Grave relocation can be undertaken by accredited Grave Relocation Specialists with permits from SAHRA (BGG).

The cemeteries are beyond the development footprint of the proposed BWS. However, should the proposed development somehow impact the cemeteries, the rating of the impact is rated High. The implementation of the above-mentioned mitigation measures for each cemetery reduces the potential impact to Low

Based on desktop research, it is concluded that fossil heritage of scientific and conservational interest in the study area is unlikely.

The construction of the development may thus be permitted in its whole extent, as the development

footprint is not considered sensitive in terms of paleontological resources. It is consequently recommended that no further Paleontological heritage studies, groundtruthing, and/or specialist mitigation are required pending the discovery of new fossil.

If fossil remains are uncovered during any phase of construction, whether exposed on the surface or revealed through excavation, the Environmental Control Officer (ECO) or the responsible site manager
must immediately contact SAHRA. All fossil discoveries must be safeguarded and reported to the South African Heritage Resources Agency (SAHRA) at 111 Harrington Street, Cape Town, PO Box 4637, Cape Town 8000, South Africa; Tel: 021 462 4502; Fax: 021 462 4509; Web: www.sahra.org.za. This ensures that recording and collection can be undertaken by a qualified palaeontologist.

Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for Paleontological impact studies proposed by SAHRA (2012). It is consequently recommended that no further Paleontological heritage studies, ground truthing, and/or specialist mitigation are required pending the discovery of new fossils. These recommendations should be included in the EMPr.

A Medium paleontological Significance has been allocated for the construction phase of the development pre-mitigation and a low significance post-mitigation.

The potential heritage-related impact of upgrading the BWS for Kakamas and the nearby surrounding villages is therefore of low significance upon implementation of the required impact mitigation measures.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

N/A

Will any building or structure older than 60 years be affected in any way?	~~YES~~	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**YES**	~~NO~~

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

According to the Kai !Garib Local Municipality Integrated Development Plan 2020 – 2021, the working age population in Kai !Garib in 2018 was 51 000, increasing at an average annual rate of 1.21% since 2008. For the same period the working age population for ZF Mgcawu District Municipality increased at 1.81% annually, while that of Northern Cape Province increased at 1.68% annually. South Africa's

working age population has increased annually by 1.50% from 32.1 million in 2008 to 37.2 million in 2018.

In 2018 the labour force participation rate for Kai !Garib was at 68.1% which is slightly lower when compared to the 71.5% in 2008. The unemployment rate is an efficient indicator that measures the success rate of the labour force relative to employment. In 2008, the unemployment rate for Kai !Garib was 11.2% and increased overtime to 12.0% in 2018. The gap between the labour force participation rate and the unemployment rate increased which indicates a positive outlook for the employment within Kai !Garib Local Municipality.

Economic profile of local municipality:

According to the Kai !Garib Local Municipality Integrated Development Plan 2020 – 2021, has a GDP of R 5.62 billion in 2018 (up from R 3.05 billion in 2008), the Kai !Garib Local Municipality contributed 22.80% to the ZF Mgcawu District Municipality GDP of R 24.6 billion in 2018 increasing in the share of the ZF Mgcawu from 23.60% in 2008. The Kai !Garib Local Municipality contributes 5.72% to the GDP of Northern Cape Province and 0.12% the GDP of South Africa which had a total GDP of R 4.87 trillion in 2018 (as measured in nominal or current prices). It's contribution to the national economy stayed similar in importance from 2008 when it contributed 0.13% to South Africa, but it is lower than the peak of 0.13% in 2008.

Level of education:

According to the Kai !Garib Local Municipality Integrated Development Plan 2020 – 2021, the number of people without any schooling decreased from 2008 to 2018 with an average annual rate of -3.17%, while the number of people within the 'matric only' category, increased from 6,420 to 8,920. The number of people with 'matric and a certificate/diploma' increased with an average annual rate of 1.35%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 0.07%. Overall improvement in the level of education is visible with an increase in the number of people with 'matric' or higher education (Table 1).

Table 1: Highest level of education : Age 15+ Kai !Garib, ZF Mgcawu, Northern Cape and National Total, 2018 [Numbers]

	Kai !Garib	ZF Mgcawu	Northern Cape	National Total	Kai !Garib as % of district municipality	Kai !Garib as % of province	Kai !Garib as % of national
No schooling	3,430	11,600	65,300	2,250,000	*29.5%*	*5.3%*	*0.15%*
Grade 0-2	1,500	4,750	19,300	685,000	*31.7%*	*7.8%*	*0.22%*
Grade 3-6	7,620	21,500	97,800	3,110,000	*35.4%*	*7.8%*	*0.25%*
Grade 7-9	14,500	43,300	177,000	6,060,000	*33.6%*	*8.2%*	*0.24%*
Grade 10-11	11,600	38,900	170,000	8,620,000	*30.0%*	*6.8%*	*0.14%*
Certificate / diploma without matric	194	748	3,740	178,000	*26.0%*	*5.2%*	*0.11%*
Matric only	8,920	43,900	197,000	10,700,000	*20.3%*	*4.5%*	*0.08%*
Matric certificate / diploma	1,470	6,780	37,900	2,200,000	*21.7%*	*3.9%*	*0.07%*
Matric Bachelors degree	505	3,250	19,500	1,600,000	*15.5%*	*2.6%*	*0.03%*
Matric Postgrad degree	138	934	6,130	726,000	*14.8%*	*2.3%*	*0.02%*

Source: IHS Markit Regional eXplorer version 1692

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 350 000 000	
What is the expected yearly income that will be generated by or as a result of the activity?	The proposed upgraded BWS is not for generating income	
Will the activity contribute to service infrastructure?	**YES**	~~NO~~
Is the activity a public amenity?	**YES**	~~NO~~
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	20 skilled and 60 unskilled	
What is the expected value of the employment opportunities during the development and construction phase?	R4 000 000	
What percentage of this will accrue to previously disadvantaged individuals?	75%	
How many permanent new employment opportunities will be created during the operational phase of the activity?	20 skilled and 25 unskilled	
What is the expected current value of the employment opportunities during the first 10 years?	R60 000 000	
What percentage of this will accrue to previously disadvantaged individuals?	75%	

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category				**If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan**
Critical Biodiversity Area (CBA)	**Ecological Support Area (ESA)**	~~Other Natural Area (ONA)~~	~~No Natural Area Remaining (NNR)~~	The proposed site overlaps a CBA 1 and an ESA identified on SANBI BGIS

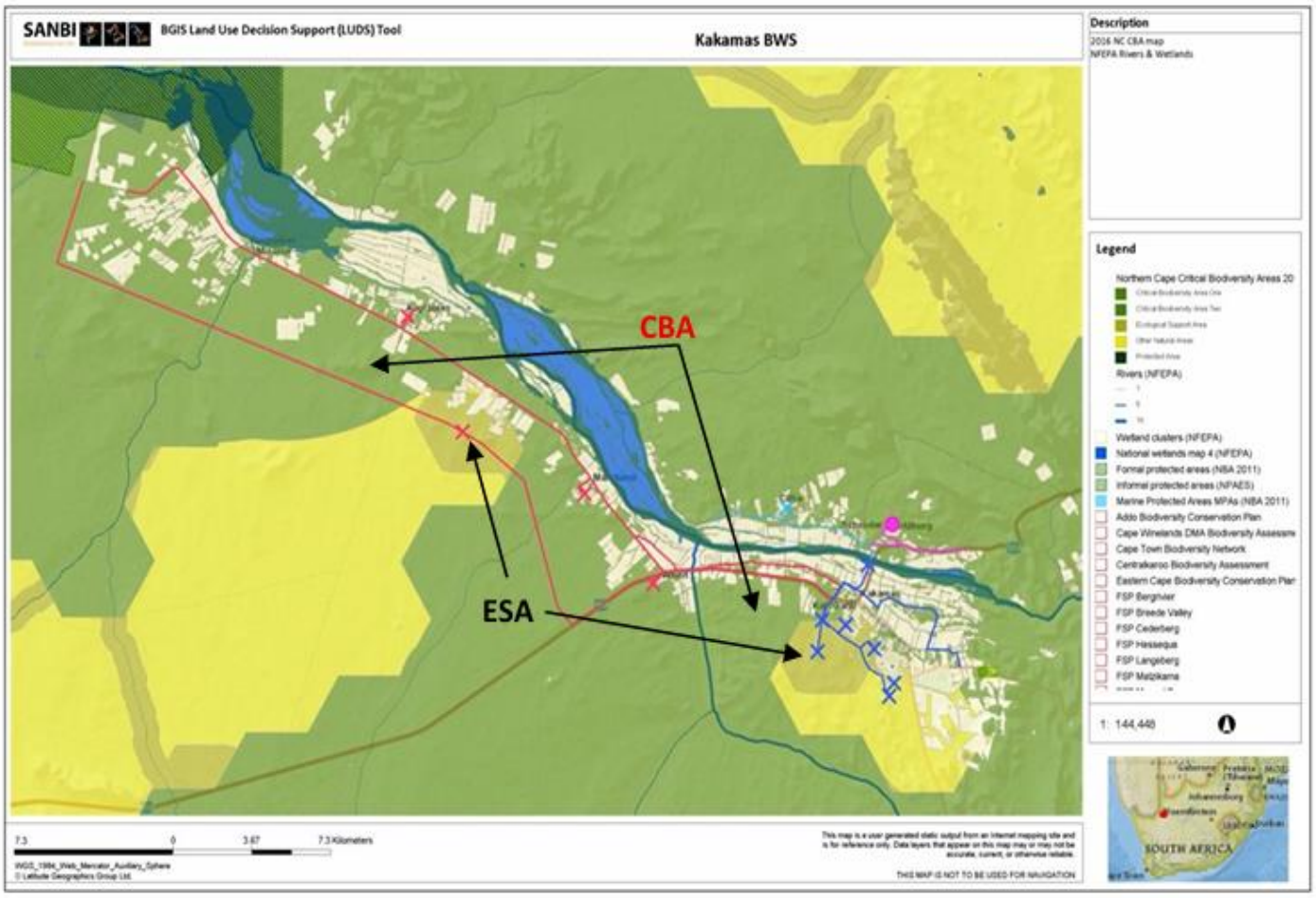


Figure 1: SANBI BGIS image of the CBAs in and around Kakamas

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	%	
Near Natural (includes areas with low to moderate level of alien invasive plants)	80%	Please refer to Terrestrial Biodiversity Compliance Statement (**Appendix D1**).
Degraded (includes areas heavily invaded by alien plants)	%	

Transformed (includes cultivation, dams, urban, plantation, roads, etc)	20%	Please refer to Terrestrial Biodiversity Compliance Statement (**Appendix D1**).

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

-

Terrestrial Ecosystems		**Aquatic Ecosystems**						
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
	Endangered							
	Vulnerable							
	Least Threatened	**YES**	~~NO~~	~~UNSURE~~	~~YES~~	**NO**	~~YES~~	**NO**

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

TERRESTRIAL BIODIVERSITY

VEGETATION TYPE & STATUS

According to the South African Vegetation map (VegMap 2024, beta), the proposed pipelines and infrastructure will mainly impact on Bushmanland Arid Grassland but may also impact on Lower Gariep Alluvial vegetation (next to the Orange River) and Lower Gariep Broken Veld (to the south of Kakamas) (Figure 3) (Mucina & Rutherford, 2006 as updated). All three of these vegetation types are classified as "Least Threatened"

SPECIAL HABITAT CONDITIONS

The landscape is relatively homogenous and does not contain any significant biophysical feature that might have resulted in special habitats for fauna or flora, apart from larger rocky hills ("koppies") at Kakamas and towards Augrabies – which will not be impacted.

VEGETATION ENCOUNTERED

Site verification confirmed that the proposed pipelines and infrastructure will mainly impact on Bushmanland Arid Grassland with a slight intrusion into Lower Gariep Broken Veld (to the south of Kakamas) (Figure 3).

The vegetation in the road reserves and urban edge is disturbed or transformed, but often still support protected tree species (especially along the Augrabies route and the Schroder- and Lutzburg routes). In general the impact on vegetation is expected to be of low significance (least threatened ecosystems), but because the development overlaps CBA1 and ESA areas and may impact on SoCC the impact on vegetation & flora combined is considered be Medium Sensitive, which can be reduced to Medium-Low Sensitive if impact mitigation recommendations are implemented.

CONSERVATION PRIORITY AREAS

According to the 2016 Northern Cape critical biodiversity areas maps the proposed Kakamas WTP will fall within an ESA (the property still supports large unfragmented portions of natural veld). However, most of the pipeline routes overlaps areas mapped as CBAs. Where the pipeline will be located in the road reserve or urban edge, the impact on ecosystem functioning (and thus the CBA) will be of low significance.

Where the pipeline route overlaps natural veld the impact should still be temporary and localised. The reasons for the CBA status is because of it falls within a FEPA Sub catchment and may impact on the NPAES and the SANParks PAES (2025). The northwestern part of the proposed development (near Rooipad and Augrabies Town) will be in close proximity to the Augrabies Falls NP (and its focus areas for expansion) (Figure 10), but does not overlap the proposed expansion areas. In addition, the temporary nature of the impacts associated with the construction of the pipeline routes should not result in any long term impacts on connectivity or vegetation. As a result, the potential impact on the National Protected Areas expansion strategy is expected to be of Low Significance.

THREATENED AND PROTECTED PLANT SPECIES

According to the DFFE Screening report, the plant species theme sensitivity is considered High Sensitive, because of the potential impact on two sensitive plant species of which one, Sensitive species 151, is considered High Sensitive. • Sensitive species 151 is a a very hardy and relatively widespread aloe from the arid regions of South Africa and Namibia, restricted to the lower reaches of the Gariep River (Orange River). It has a red-list status of “Least Concern”. This species was not observed during the study, but may be encountered. • Sensitive species 143 is one of the best know plants of the family Aspodelaceae in the Northern Cape. It has a red-list status of “Vulnerable”. Current projections show that climate change is a significant factor affecting this species. Climate models estimate that by 2070, the species may lose between 33% and 67% of its suitable bioclimatic range. Several Species of Conservation Concern (SoCC) were observed including two red-listed species, one of which is also protected in terms of NEM:BA. Three NFA protected tree species were observed as well as several species protected in terms of the Northern Cape Nature Conservation Act (NCNCA). • Most of the NCNCA protected species are common widespread species with a red list status of Least Concern (Table 9); • No individuals of Boscia albitrunca, Euclea pseudebenus or Sensitive species 143 are expected to be impacted (they will be easy to avoid). • However, depending on the pipeline route selected, some individuals of Vachellia erioloba are likely to be impacted (Refer to Heading 8 for the proposed mitigation recommendations). With mitigation a sensitivity rating of Medium-Low to Low Sensitive can be achieved.

FAUNA & AVI FAUNA

According to the DFFE Screening tool report for the site (Appendix 1), the Animal Species Theme Sensitivity is considered HIGH SENSITIVE because the footprint overlaps the known distribution range of five sensitive bird- and one sensitive mammal species. SABAP2 confirms the presence of 4 of these species, but not that of the Caspian tern (Hydroprogne caspia). The project entails the transformation of small areas of land (e.g, for the WTP and new reservoirs near the urban edge), but most of the pipelines will be underground – which relates to a shortish construction period with a temporary impact. Because of the degraded status and anthropogenic activity associated with most of the sites it is considered unlikely that the proposed development will result in any significant additional impact on the breeding or feeding patterns of these species. With regards to this project an animal sensitivity rating of Low Sensitive is considered appropriate.

MAIN CONCLUSION

The DFFE Environmental Screening Report gives the relative Terrestrial Biodiversity theme sensitivity as Very High Sensitivity because the study area overlaps both critical biodiversity areas (CBA1) and ecological support areas (ESA) areas. The reasons for the CBA status are discussed below in terms of the proposed development after site verification. The proposed development will result in the transformation of land for the construction of the new Kakamas Waste Treatment Plant (WTP) (>1.5ha), the new Renosterkop Storage Reservoir (20 Megalitre) (>0.5ha), the new Kakamas East Reservoir (725 Kiloliter) (>0.5ha) and the new Augrabies Reservoir (>0.5ha). The connecting pipelines will be located in disturbed road reserves or within the urban edge (about 50-55km of pipeline if the Kakamas Alternative 1 is used), but some of the pipelines routes will impact on natural veld (up to 40km, if the Kakamas Alternative 2 options is used). The disturbance or impact is expected to be temporary, localized, and reversible, but it is likely to impact on protected plant species (especially several Vachellia erioloba trees). Because the pipeline is located within existing road reserves, most impacts are expected to be temporary, localized, and reversible. With good environmental control— avoidance of sensitive habitats, rescue or protection of plant SoCC, erosion control, pollution prevention, and rehabilitation of disturbed areas—the long-term impacts are generally expected to be Low. Particular attention should be given to watercourse crossings, protected flora, and preventing the spread of invasive alien plants. No fatal flaws or any other obstacles

were found with respect to the flora, vegetation, fauna, and terrestrial biodiversity. With mitigation it is considered highly unlikely that the development will contribute significantly to any of the following:
• Significant loss of vegetation type and associated habitat.
• Loss of ecological processes (e.g., migration patterns, pollinators, river function etc.) due to construction and operational activities.
• Loss of local biodiversity and threatened species.
• Loss of ecosystem connectivity. The findings of this assessment suggest that the relative terrestrial biodiversity theme sensitivity should be Medium Sensitive (not Very High Sensitive as suggested in the DFFE screening report). With mitigation impacts can be reduced to low sensitive.

AQUATIC ECOLOGY

According to the freshwater study report, the study area within the Northern Cape represents drainage of surface water across a wide hydrological spectrum and the diversity of streams and rivers are classified based on surface flow duration, flow predictability and geomorphic position. The different drainage systems include wash sheets and hillslope, ephemeral streams and rivers, seasonal rivers and permanent or perennial rivers. The ecological integrity of a river is based on the concept of biological integrity that is "the ability to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity and functional organisation comparable to that of natural habitat of the region" (Karr and Dudley 1981).

During the desktop investigation, several aquatic resources were identified that may be impacted by the construction and/or authorised activities. Most however are unnamed streams (wash sheets and ephemeral channels) with poorly defined channels or riparian vegetation. Most of these ephemeral channels drain into the Hartbees, Brabees and Slang rivers, all tributaries of the Lower Orange River (receiving environment)

Rivers in the lower Orange River catchment are largely rated as having a C and D PES category. The water resources in this catchment are dominated by depression, seep and unchanneled valley bottom wetlands which cover approximately 2% of the catchment area. The Orange River from Upington to Hartbees River confluence show changes to water quality, with a PES category of D/E (decline). The reach dominated by intensive agricultural activity and includes the Neusberg weir and WMS monitoring point (important for monitoring the proposed project). From the Hartbees (Kakamas) further west (to Augrabies Waterfall) the mainstem of the Orange River is dominated by intensive agricultural activity. Flow and water quality is similarly impacted with the PES predominantly a C/D category. This section of the river is an important fish sanctuary with a number of red data species present (Moodley et al., 2025).

The different systems were characterised as follows:

- Class 1 streams (wash sheets) with no discernible or visible drainage line and includes the wash sheet and ephemeral channels.
- Class 2 ephemeral drainage lines with some marginal vegetation (referred to as xeroriparian vegetation).
- Class 3 systems with a clearly defined ephemeral drainage line and defined riparian vegetation component.
- Class 4 systems with an obvious, discernible drainage line and a clear sign of sediment transportation (seasonal rivers).
- Class 5 systems with a well-defined river channel and riparian vegetation component (perennial rivers).

After the assessment the number of aquatic resource crossings mapped (total 207 sites):

Route	Class 1	Class 2	Class 3	Class 4	Class 5
All Routes Combined	147	46	10	3	1
Total	207				

Site Sensitivity Verification Statement for the Aquatic Biodiversity Theme

The Screening Tool Report (STR) related to the Aquatic Biodiversity Theme shows that the resources in the study area are rated **very high sensitivity**. This includes the abstraction point in the Orange River and the pipeline crossings of the Hartbees, the Slang and the Brabees rivers.

The STR protocol requires a review of the environment to confirm or dispute the rating. To comply to the regulations a specialist impact assessment was conducted to evaluate the aquatic ecosystem integrity. The ephemeral and seasonal systems are fragile alluvial and riparian ecological systems that function as critical ecological corridors in the arid environment. In these stochastic stream systems, the dynamic flood scouring, sediment transportation and bank erosion may directly threaten their linear infrastructure integrity.

After the review of the study area, it is recommended that the **very high sensitivity rating for the aquatic biodiversity** theme, as reflected in the STR **is maintained.** This recommendation is based on the assessment during the site visit and desktop review that indicated that current and historic activities have a negative impact on the ecosystem. The pressure on the water resources and the receiving environment need to sensitise developers, regulators and society of the fragility of the arid environments. Cumulative downstream risks related to the trenching activities during pipeline construction will be low (negligible), if all recommendations and mitigation strategies are rigorously employed.

Construction and Engineering Mitigation

- It is important to minimise the footprint near the sensitive areas. It is critical to only use the approved corridor width when working on the streambed and streambanks. Restrict all laydown areas, vehicle staging and fuel storage to areas outside the riparian boundary of any ephemeral wash or riverbed. It is recommended that existing construction yards are used for the project.
- The use of rock-pack gabions instead of hard concrete liners to protect stream banks and channels is recommended. The gabions reduce flow velocity and movement of water through the structure which reduces erosion downstream.

  - Only clear areas where construction will take place. This will lower the risk of erosion (wind and water) in exposed areas where no work is taking place.
  - Areas must be rehabilitated immediately after the installation of the pipeline is completed.
  - If large areas are exposed, geotextiles can be used to stabilise soils – prevent wind and water erosion.
- Construction (trenches) must be limited to the dry, winter months. On larger crossings the use of temporary diversions with flow velocity dissipaters to manage any unexpected flow must be employed. It will be important to have effective sediment screens to ensure no impacts downstream of the site.

Ecological and Rehabilitation Protocols

- It is critical that the top 30cm of biologically active alluvial soil (topsoil) is stripped and stockpiled. Once activities are completed, the topsoil must be backfilled immediately to preserve local seed banks and soil bacteria.
- In addition, alien vegetation eradication must be cleared within the working corridor. It is important to implement a 24-month follow-up weed control program after completion of the work at a site.
- After completion of the work, micro-topography restoration is critical and re-contour of the ephemeral stream bed and banks must match the pre-construction cross-sections to avoid the diversion of water that can impact on the natural flood scouring patterns, especially the stream banks.

Monitoring and Surveillance Strategies

- Pre- and post-rainfall inspections must be carried out by the Environmental Control Officer (ECO) to evaluate changes at all crossings before forecasted summer thunderstorms and immediately after initial seasonal flow events. All impacts must be recorded and rehabilitated immediately.
- As an additional monitoring option, erosion and scour tracking can be done with ground-level photo monitoring points at crossing points to detect bed lowering or lateral bank erosion.
- It is recommended to do two-year (annually after completion) integrity audits. The ecologist can assess the crossing points and advise the client on the effective maintenance of the impacted areas.

“Although temporary disturbances to the aquatic environment are anticipated during construction and implementation activities, these impacts are expected to be limited in extent and duration if best-practice environmental management measures are effectively applied. Potential risks include increased sedimentation, localised erosion, vegetation disturbance, alteration of surface water flow patterns, and deterioration of water quality. However, with appropriate planning, construction controls, rehabilitation, and ongoing environmental oversight, these impacts can be minimised to negligible or low significance levels”.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Gemsbok	
Date published	17 April 2026	
Site notice position	**Latitude**	**Longitude**
Date placed	17 April 2026	

Include proof of the placement of the relevant advertisements and notices in Appendix E3.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Pre-application PPP (Refer to Appendix E)

- An initial register of possible interested and affected parties (I&APs) was compiled (Appendix E1)
- A site visit was conducted on 17 April 2026 to familiarise with the proposed site and nearby surrounding area and identify environmental sensitivities associated with the proposed site (Appendix B).
- On 17 April 2026, posters were placed on site as well as at the Kakamas Agrimark, Kai !Garib Kakamas Municipal Building (Appendix E2, refers).
- An advertisement was placed in a local newspaper *i.e*., the *Gemsbok* which was published on 17 April 2026 (Appendix E3).
- On 20 April 2026 an initial email notifying them of the intent to develop was sent to all I&APs (Appendix E4).
- The comments received in response to the initial lapsed application and the responses thereto are included in the Comments-Responses Report attached to this Draft BAR.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E4. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
Please refer to Appendix E5	Please refer to Appendix E5

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E5.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel.:	e-mail	Postal address
Department: Cooperative Governance, Human Settlements and Traditional Affairs	Ms Gladys Botha	053 830 9513	gbotha@ncpg.gov.za	Private Bag X5005, Kimberley, 8300
Department: Health Services:	Ms Gugulethu Matlaopane	053 830 2148	nchealthhr@ncpg.gov.za	Private Bag X5049, Kimberley, 8300
Department: Roads and Public Works:	M. Kgomongwe	0538392241	mkgomongwe@ncpg.gov.za	P. O. Box 3132, Kimberley, 8300
Department: Transport, Safety and Liaison:	Mr Lesego Wolfe	053 839 1702	lwolfe@ncpg.gov.za	Private Bag X1368, Kimberley, 8300
Chief Forester: NFA Regulations Dept of Forestry and Environment	Ms J. Mans	082 808 2737	Jmans@dffe.gov.za	26 Olien Street, Louisvaleroad, Upington, 8801
Dept of Water and Sanitation	Ms A. Hlengani	053 7731239	HlenganiA@dws.gov.za	Private Bag X6101, Kimberley, 8300
SAHRA	Ms Natasha Higgitt		nhiggitt@sahra.org.za	
Agri NC	Ms Nicole Jansen	053 832 9595	henning@agrink.co.za	2 Bebington St, Monument Heights, Kimberley, 8301

DFFE Biodiversity Conservation	Mr Seoka Lekota		BCAdmin@environment.gov.za	
Eskom	Mr John Geeringh	011 516 7233	john.geeringh@eskom.co.za	Eskom Transmission, Megawatt Park P.O. Box 1091, Johannesburg, 2001
South African National Roads Agency	Ms Nicole Abrahams	021 957 46 02	AbrahamsN@nra.co.za	1 Havenga Street, Oakdale, Bellville, 7530
Civil Aviation Authority (CAA)	Ms Evelyn Shogole	083 451 2663	environment@caa.co.za	North Wing, 2nd Floor, Oval Business Park, Freight Road, Cape Town International Airport, Cape Town, 7525
ZF Mgcawu District Municipality	Tinus Galloway		tgalloway@zfm-dm.gov.za	

Include proof that the Authorities and Organs of State received written notification of the proposed activities as Appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as Appendix E1.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
Alternative 1 (Preferred Alternative)			
	Direct impacts:		
	Terrestrial biodiversity	Significance after mitigation	Proposed mitigation
	Loss of vulnerable or endangered vegetation and associated habitat.	Low (Negative)	• All construction should be done in accordance with an approved construction phase Environmental Management Plan (EMP) approved by the Northern Cape Department of Environmental Affairs • A suitably qualified Environmental Control Officer should be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies • Before any work is done the footprint must be clearly demarcated. The demarcation must aim at minimisation of the impact on SoCC. • The "Search & Rescue" recommendations given in Table 9 of the Terrestrial Biodiversity Study Report must be implemented: • A botanist or a suitably qualified ECO must inspect the demarcated routes for plants SoCC that need to be searched for & rescued . • Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • In addition, all efforts should be made to protect all other mature indigenous trees (e.g., Pappea capensis individuals). • A Northern Cape Nature Conservation Act permit must be obtained for the potential impacts on the NCNCA protected species.
	Potential impact on protected areas, CBAs, ESAs or Centres of Endemism. The vegetation itself is not vulnerable or endangered	Medium (Negative)	
	Potential loss of ecological migration corridors.	Low (Negative)	
	Potential impact on threatened or protected plant species.	Medium (Negative)	
	Potential impact on mammals, reptiles, amphibians	Low (Negative)	
	Potential impact on Avifauna	Low (Negative)	

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• A NEM:BA permit must be obtained, should any of the Hoodia gordonii individuals had to be re-planted. • Care must be taken at watercourse crossings – they must be managed to minimise disturbance to the watercourse, prevent erosion and sedimentation. • All river crossings must be rehabilitated. • Erosion control measures must be implemented. • Care must be taken to prevent the spread of alien invasive species. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. • Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of these species due to incorrect eradication methods); • Care must be taken to dispose of alien plant material responsibly. An integrated waste management approach must be implemented during construction and all waste within the footprint area must be removed and disposed to the local Municipal waste disposal site. • Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
	Freshwater Resources	Significance after mitigation	Proposed mitigation
	Soil erosion	Low (Negative)	• Progressive surface stabilisation and wind barriers • At sites where runoff is expected, construct temporary berms or diversion channels to protect the active stream bed from heavy winds and direct runoff

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• The use of biodegradable erosion control blankets to protect against scouring caused by wind and water flows. • Limit vegetation clearance and restrict clearance to the absolute minimum footprint required Refer to EMPr for further mitigation measures
	Chemical spillage prevention	Low (Negative)	• Changing of oil, servicing, repairs, refuelling and lubricating of equipment should only be carried out in the designated area as approved for the project. • Daily inspections of machinery for leaking oils must be done. If any leaks are observed found a drip trays must be placed under the machinery/vehicle, the incident must be reported and the leak fixed before use on the construction site. • A specific area must be designated for the storage of hazardous chemicals such as fuel. • Construction materials that are prone to spillage are to be stored in suitable containers with impermeable flooring to prevent pollution of the environment. • Oil and fuel storage areas should be surrounded by a bund wall in order to contain spillages. In the case where soil becomes contaminated with oil, it must be removed for proper disposal or treatment (e.g. bioremediation). Refer to EMPr for further mitigation measures
	Habitat loss and clearing of vegetation	Low (Negative)	• Stabilisation of the riverbank should be implemented at sections of the river with a high probability of being affected by the construction activities. The stabilisation methods should ensure that adequate marginal vegetation is available for aquatic biota (specifically Class 4 and 5 rivers)

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Re-vegetation with functional indigenous species on accessible margins of the river should be actioned during the rehabilitation process and will ensure adequate habitat rehabilitation and ensure succession of indigenous plant species over alien species • Vegetation clearing must be done by hand. Vegetation clearing shall be removed and disposed of correctly, especially alien species (prevent seed distribution). Refer to EMPr for further mitigation measures
	Contamination – hazardous, general and human waste	Low (Negative)	• Construction vehicles must be monitored daily for oil and fuel leaks. Any spillage must be immediately mitigated with the appropriate methods and leaks repaired before the vehicles are used on the construction sites. • Under no circumstances should hazardous materials and wastes be stored or temporary placed in the delineated riparian zones or outside the designated storage zones. Refer to EMPr for further mitigation measures
	Resuspension and introduction of sediment/materials	Low (Negative)	• The ECO and staff should monitor and report any benthic disturbances on account of stormwater inputs and surface run-off. • The contractor is to ensure that should there be any excessive quantities of sand, silt and silt-laden water, it does not enter the natural water resources. • Maintain Excavated material should be placed on the upstream side of the trench so that should any excavated material be displaced during rainfall; it will flow back into the trench rather than towards the watercourse Refer to EMPr for further mitigation

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			measures
	Heritage	Significance after mitigation	Proposed mitigation
	Potential impact on historically significant structures	Low (Negative)	• Maintain buffer zone of at least 15m X 20m between development proposal and old stone-walled house of granite located at (28º 44' 26.3"S, 20º 33' 28.8"E) in close proximity to an existing farmhouse • Maintain a buffer zone of at least 10m to separate the old railway bridge of metal and concrete at coordinates (28º 45' 24.7″S 20º 37' 12.2"E) from the proposed pumphouse supply line to WTP.
	Potential impact on Graves	Low (Negative)	• The cemetery at KSS/1500/F/19/006 is located approximately 10m north of an existing road and the proposed Augrabies main supply line. A 15 x 30m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection • The cemetery at KSS/1181/008 is located approximately 11 m south of an existing road. A 20m x 25m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection. • The cemetery at KSS/176/004 is located approximately 65 m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection. • The cemetery at KSS/399/19/007 is located approximately 107m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50 m precautionary no-

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection. • The cemeteries should be demarcated and avoided by personnel and equipment.
	Palaeontology	Low (Negative)	• If Palaeontological resources are uncovered on the proposed site, the Chance Find Protocol must be implemented immediately. Fossil discoveries must be protected and the ECO/site manager must report to the South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out. • Before any fossil material can be collected from the development site, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). .
	Agriculture	Significance after mitigation	Proposed mitigation
	Loss of future agricultural production potential.	Low (Negative)	• No high-value or perennial crops (e.g. table-grape vineyards, orchards, date palms) may be disturbed. Routes must be micro-sited around such crops; where unavoidable, alignment must follow existing road reserves, farm tracks or servitudes. • Construction must be confined to a working width of 10m. No stockpiling, turning or laydown outside the demarcated corridor • Topsoil (upper horizon) must be stripped separately, stockpiled apart from subsoil, and replaced in original sequence on backfill to preserve the soil profile and rooting medium. This should only be implemented on soils deeper than 500mm which is not expected to be much in the area.

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Trenching across irrigated land should, where practicable, be scheduled outside peak growing and harvest periods to limit production loss. • Disturbed land must be re-contoured, decompacted (ripped) and re-established so that it returns to its pre-construction agricultural state within two years of completing construction • Compaction caused by machinery must be relieved across the trench line; cross-drainage and irrigation furrows interrupted during construction must be reinstated • Disturbed soil must be monitored and cleared of declared weeds and alien invasive species during the rehabilitation period.
	Visual	Significance after mitigation	Proposed mitigation
	Site may not be aesthetically appealing against natural background.	Low (Negative)	This impact cannot be avoided. Mitigation measures as per the EMP.
	Noise	Significance after mitigation	Proposed mitigation
	Noise will be generated during the construction phase.	Low (Negative)	• Any noise generated by construction activities will be a temporary impact far off from most residential homes however, the following mitigation measures will be implemented: • A complaint register to be maintained on-site. Any complaints received must be responded to and rectified accordingly. The ECO must be notified of any complaints. • All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors. • Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00).

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
	Dust	Significance after mitigation	Proposed mitigation
	Dust will be generated during the construction of the proposed development.	Low (Negative)	The following mitigation measures must be implemented: • Stockpiled material must be covered with a plastic sheet, tarp or similar material in windy conditions; • The proposed site and the roads leading to the proposed site must be sprayed with water to reduce construction related dust;
	Indirect impacts:		
	Socio-economic	Significance after mitigation	Proposed mitigation
	• Reliable municipal bulk water supply for Kakamas and the nearby surrounding nearby villages until well into the future • Creation of employment opportunities and enhancement of business opportunities for building supplies companies.	High (Positive)	Mitigation is not required
	Traffic	Significance after mitigation	Proposed mitigation
	Increase in trucks and other construction vehicles.	Medium-High (Negative)	• The site must be made easily accessible to all construction traffic travelling along main routes; • If required, point's men must be in attendance to direct traffic when heavy vehicles are accessing or leaving the site to ensure that there are no accidents.
	Cumulative impacts:		
	Biodiversity	Significance after mitigation	Proposed mitigation
	Cumulative impact associated with proposed activity.	Medium-High (Negative)	As above Biodiversity impact mitigation measures
	Freshwater Resources	Significance after mitigation	Proposed mitigation
	Orange River and tributaries conservation value, considering the extent, duration, severity and likelihood of impact	Medium (Negative)	As above freshwater impact mitigation measures
	Drainage lines conservation value	Medium (Negative)	As above freshwater impact mitigations

Alternative 1 (Preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
	considering the extent, duration, severity and likelihood of impact		
	Heritage	Significance after mitigation	Proposed mitigation
	Cumulative impact associated with proposed activity.	Medium (Positive)	Cumulatively, there will not be a drastic loss to heritage resources for the region if the impact mitigation measures contained in the EMPr are adhered to.
	Socio-economic	Significance after mitigation	Proposed mitigation
	- Enhanced supply of bulk municipal water	High (Positive)	No mitigation required.

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
Alternative 1 (Preferred Alternative)			
	Direct impacts:		
	Terrestrial biodiversity	Significance after mitigation	Proposed mitigation
	Loss of vulnerable or endangered vegetation and associated habitat.	Low (Negative)	• All construction should be done in accordance with an approved construction phase Environmental Management Plan (EMP) approved by the Northern Cape Department of Environmental Affairs • A suitably qualified Environmental Control Officer should be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies • Before any work is done the footprint must be clearly demarcated. The demarcation must aim at minimisation of the impact on SoCC. • The "Search & Rescue" recommendations given in Table 9 of
	Potential impact on protected areas, CBAs, ESAs or Centres of Endemism. The vegetation itself is not vulnerable or endangered	Medium (Negative)	
	Potential loss of ecological migration corridors.	Low (Negative)	
	Potential impact on threatened or protected plant species.	Medium (Negative)	
	Potential impact on mammals, reptiles, amphibians	Low (Negative)	
	Potential impact on Avifauna	Low (Negative)	

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			the Terrestrial Biodiversity Study Report must be implemented: • A botanist or a suitably qualified ECO must inspect the demarcated routes for plants SoCC that need to be searched for & rescued . • Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • In addition, all efforts should be made to protect all other mature indigenous trees (e.g., Pappea capensis individuals). • A Northern Cape Nature Conservation Act permit must be obtained for the potential impacts on the NCNCA protected species. • A NEM:BA permit must be obtained, should any of the Hoodia gordonii individuals had to be re-planted. • Care must be taken at watercourse crossings – they must be managed to minimise disturbance to the watercourse, prevent erosion and sedimentation. • All river crossings must be rehabilitated. • Erosion control measures must be implemented. • Care must be taken to prevent the spread of alien invasive species. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. • Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of these species due to incorrect eradication methods);

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Care must be taken to dispose of alien plant material responsibly. An integrated waste management approach must be implemented during construction and all waste within the footprint area must be removed and disposed to the local Municipal waste disposal site. • Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
	Freshwater Resources	Significance after mitigation	Proposed mitigation
	Soil erosion	Low (Negative)	• Progressive surface stabilisation and wind barriers • At sites where runoff is expected, construct temporary berms or diversion channels to protect the active stream bed from heavy winds and direct runoff • The use of biodegradable erosion control blankets to protect against scouring caused by wind and water flows. • Limit vegetation clearance and restrict clearance to the absolute minimum footprint required Refer to EMPr for further mitigation measures
	Chemical spillage prevention	Low (Negative)	• Changing of oil, servicing, repairs, refuelling and lubricating of equipment should only be carried out in the designated area as approved for the project. • Daily inspections of machinery for leaking oils must be done. If any leaks are observed found a drip trays must be placed under the machinery/vehicle, the incident must be reported and the leak fixed before use on the construction site. • A specific area must be designated for the storage of hazardous chemicals such as fuel.

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Construction materials that are prone to spillage are to be stored in suitable containers with impermeable flooring to prevent pollution of the environment. • Oil and fuel storage areas should be surrounded by a bund wall in order to contain spillages. In the case where soil becomes contaminated with oil, it must be removed for proper disposal or treatment (e.g. bioremediation). Refer to EMPr for further mitigation measures
	Habitat loss and clearing of vegetation	Low (Negative)	• Stabilisation of the riverbank should be implemented at sections of the river with a high probability of being affected by the construction activities. The stabilisation methods should ensure that adequate marginal vegetation is available for aquatic biota (specifically Class 4 and 5 rivers) • Re-vegetation with functional indigenous species on accessible margins of the river should be actioned during the rehabilitation process and will ensure adequate habitat rehabilitation and ensure succession of indigenous plant species over alien species • Vegetation clearing must be done by hand. Vegetation clearing shall be removed and disposed of correctly, especially alien species (prevent seed distribution). Refer to EMPr for further mitigation measures
	Contamination – hazardous, general and human waste	Low (Negative)	• Construction vehicles must be monitored daily for oil and fuel leaks. Any spillage must be immediately mitigated with the appropriate methods and leaks repaired before the vehicles are used on the construction sites. • Under no circumstances should hazardous materials and wastes be stored or temporary placed in the

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			delineated riparian zones or outside the designated storage zones. Refer to EMPr for further mitigation measures
	Resuspension and introduction of sediment/materials	Low (Negative)	• The ECO and staff should monitor and report any benthic disturbances on account of stormwater inputs and surface run-off. • The contractor is to ensure that should there be any excessive quantities of sand, silt and silt-laden water, it does not enter the natural water resources. • Maintain Excavated material should be placed on the upstream side of the trench so that should any excavated material be displaced during rainfall; it will flow back into the trench rather than towards the watercourse Refer to EMPr for further mitigation measures
	Heritage	Significance after mitigation	Proposed mitigation
	Potential impact on historically significant structures	Low (Negative)	• Maintain buffer zone of at least 15m X 20m between development proposal and old stone-walled house of granite located at (28º 44' 26.3"S, 20º 33' 28.8"E) in close proximity to an existing farmhouse • Maintain a buffer zone of at least 10m to separate the old railway bridge of metal and concrete at coordinates (28º 45' 24.7"S 20º 37' 12.2"E) from the proposed pumphouse supply line to WTP.
	Potential impact on Graves	Low (Negative)	• The cemetery at KSS/1500/F/19/006 is located approximately 10m north of an existing road and the proposed Augrabies main supply line. A 15 x 30m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection • The cemetery at KSS/1181/008 is located approximately 11 m south of

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			an existing road. A 20m x 25m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection. • The cemetery at KSS/176/004 is located approximately 65 m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection. • The cemetery at KSS/399/19/007 is located approximately 107m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50 m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection. • The cemeteries should be demarcated and avoided by personnel and equipment.
	Palaeontology	Low (Negative)	• If Palaeontological resources are uncovered on the proposed site, the Chance Find Protocol must be implemented immediately. Fossil discoveries must be protected and the ECO/site manager must report to the South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out. • Before any fossil material can be collected from the development site, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). .

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
	Agriculture	Significance after mitigation	Proposed mitigation
	Loss of future agricultural production potential.	Low (Negative)	• No high-value or perennial crops (e.g. table-grape vineyards, orchards, date palms) may be disturbed. Routes must be micro-sited around such crops; where unavoidable, alignment must follow existing road reserves, farm tracks or servitudes. • Construction must be confined to a working width of 10m. No stockpiling, turning or laydown outside the demarcated corridor • Topsoil (upper horizon) must be stripped separately, stockpiled apart from subsoil, and replaced in original sequence on backfill to preserve the soil profile and rooting medium. This should only be implemented on soils deeper than 500mm which is not expected to be much in the area. • Trenching across irrigated land should, where practicable, be scheduled outside peak growing and harvest periods to limit production loss. • Disturbed land must be re-contoured, decompacted (ripped) and re-established so that it returns to its pre-construction agricultural state within two years of completing construction • Compaction caused by machinery must be relieved across the trench line; cross-drainage and irrigation furrows interrupted during construction must be reinstated • Disturbed soil must be monitored and cleared of declared weeds and alien invasive species during the rehabilitation period.
	Visual	Significance after mitigation	Proposed mitigation
	Site may not be aesthetically appealing against natural background.	Low (Negative)	This impact cannot be avoided. Mitigation measures as per the EMP.

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
	Noise	Significance after mitigation	Proposed mitigation
	Noise will be generated during the construction phase.	Low (Negative)	• Any noise generated by construction activities will be a temporary impact far off from most residential homes however, the following mitigation measures will be implemented: • A complaint register to be maintained on-site. Any complaints received must be responded to and rectified accordingly. The ECO must be notified of any complaints. • All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors. • Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00).
	Dust	Significance after mitigation	Proposed mitigation
	Dust will be generated during the construction of the proposed development.	Low (Negative)	The following mitigation measures must be implemented: • Stockpiled material must be covered with a plastic sheet, tarp or similar material in windy conditions; • The proposed site and the roads leading to the proposed site must be sprayed with water to reduce construction related dust;
	Indirect impacts:		
	Socio-economic	Significance after mitigation	Proposed mitigation
	• Reliable municipal bulk water supply for Kakamas and the nearby surrounding nearby villages until well into the future • Creation of employment opportunities and enhancement of business opportunities for building supplies companies.	High (Positive)	Mitigation is not required
	Traffic	Significance after mitigation	Proposed mitigation

Alternative 3 (Less preferred Alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
	Increase in trucks and other construction vehicles.	Medium-High (Negative)	• The site must be made easily accessible to all construction traffic travelling along main routes; • If required, point's men must be in attendance to direct traffic when heavy vehicles are accessing or leaving the site to ensure that there are no accidents.
	Cumulative impacts:		
	Biodiversity	Significance after mitigation	Proposed mitigation
	Cumulative impact associated with proposed activity.	Medium-High (Negative)	As above Biodiversity impact mitigation measures
	Freshwater Resources	Significance after mitigation	Proposed mitigation
	Orange River and tributaries conservation value, considering the extent, duration, severity and likelihood of impact	Medium (Negative)	As above freshwater impact mitigation measures
	Drainage lines conservation value considering the extent, duration, severity and likelihood of impact	Medium (Negative)	As above freshwater impact mitigations
	Heritage	Significance after mitigation	Proposed mitigation
	Cumulative impact associated with proposed activity.	Medium (Positive)	Cumulatively, there will not be a drastic loss to heritage resources for the region if the impact mitigation measures contained in the EMPr are adhered to.
	Socio-economic	Significance after mitigation	Proposed mitigation
	- Enhanced supply of bulk municipal water	High (Positive)	No mitigation required.

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
.....	***Direct impacts:***		
	Terrestrial biodiversity	Significance after mitigation	Proposed mitigation
	Loss of vulnerable or endangered vegetation and associated habitat.	Low (Negative)	• All construction should be done in accordance with an approved construction phase Environmental Management Plan (EMP) approved by the Northern Cape Department of Environmental Affairs. • A suitably qualified Environmental Control Officer should be appointed to monitor the construction phase in terms of the EMPr and any other conditions pertaining to specialist studies. • Before any work is done the footprint must be clearly demarcated. The demarcation must aim at minimisation the impact on SoCC. • The "Search & Rescue" recommendations given in Table 9 of the Terrestrial Biodiversity Study Report must be implemented: • A botanist or a suitably qualified ECO must inspect the demarcated routes for plants SoCC that needs to be searched & rescued . • Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. • In addition, all efforts should be made to protect all other mature indigenous trees (e.g., Pappea capensis individuals). • A Northern Cape Nature Conservation Act permit must be obtained for the potential impacts on the NCNCA protected species. • A NEM:BA permit must be obtained, should any of the Hoodia gordonii individuals had to be re-planted.
	Potential impact on protected areas, CBAs, ESAs or Centres of Endemism. The vegetation itself is not vulnerable or endangered	Medium (Negative)	
	Potential loss of ecological migration corridors.	Low (Negative)	
	Potential impact on threatened or protected plant species.	Low (Negative)	
	Potential impact on mammals, reptiles, amphibians	Low (Negative)	
	Potential impact on Avifauna	Low (Negative)	

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Care must be taken at watercourse crossings – they must be managed to minimise disturbance to the watercourse, prevent erosion and sedimentation. • All river crossings must be rehabilitated. • Erosion control measures must be implemented. Care must be taken to prevent the spread of alien invasive species. • All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. • Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of these species due to incorrect eradication methods); • Care must be taken to dispose of alien plant material responsibly. • An integrated waste management approach must be implemented during construction and all waste within the footprint area must be removed and disposed to the local Municipal waste disposal site. • Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
	Freshwater Resources	Significance after mitigation	Proposed mitigation
	Soil erosion	Low (Negative)	• Progressive surface stabilisation and wind barriers, • At sites where runoff is expected, construct temporary berms or diversion channels to protect the active stream bed from heavy winds and direct runoff • The use of biodegradable erosion control blankets to protect against scouring caused by wind and water flows.

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Limit vegetation clearance and restrict clearance to the absolute minimum footprint required Refer to EMPr for further mitigation measures
	Chemical spillage prevention	Medium (Negative)	• Changing of oil, servicing, repairs, refuelling and lubricating of equipment should only be carried out in the designated area as approved for the project. • Daily inspections of machinery for leaking oils must be done. If any leaks are observed found a drip trays must be placed under the machinery/vehicle, the incident must be reported and the leak fixed before use on the construction site. • A specific area must be designated for the storage of hazardous chemicals such as fuel. • Construction materials that are prone to spillage are to be stored in suitable containers with impermeable flooring to prevent pollution of the environment. • Oil and fuel storage areas should be surrounded by a bund wall in order to contain spillages. In the case where soil becomes contaminated with oil, it must be removed for proper disposal or treatment (e.g. bioremediation) • Incidents to be reported, rehabilitated and monitored. Refer to EMPr for further mitigation measures
	Habitat loss and clearing of vegetation	Low (Negative)	• Stabilisation of the riverbank should be implemented at sections of the river with a high

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			probability of being affected by the construction activities. The stabilisation methods should ensure that adequate marginal vegetation is available for aquatic biota (specifically Class 4 and 5 rivers). • Re-vegetation with functional indigenous species on accessible margins of the river should be actioned during the rehabilitation process and will ensure adequate habitat rehabilitation and ensure succession of indigenous plant species over alien species • Vegetation clearing must be done by hand. Vegetation clearing shall be removed and disposed of correctly, especially alien species (prevent seed distribution). Refer to EMPr for further mitigation measures -
	Contamination – hazardous, general and human waste	Low (Negative)	• Construction vehicles must be monitored daily for oil and fuel leaks. Any spillage must be immediately mitigated with the appropriate methods and leaks repaired before the vehicles are used on the construction sites. • Under no circumstances should hazardous materials and wastes be stored or temporary placed in the delineated riparian zones or outside the designated storage zones. Refer to EMPr for further mitigation measures
	Resuspension and introduction of sediment/materials	Low (Negative)	• Appropriate measures such as the implementation of silt traps, or areas to contain silt before entering the watercourses, should be used. • The ECO and staff should monitor and report any benthic disturbances on account of

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			stormwater inputs and surface run-off. • The contractor is to ensure that should there be any excessive quantities of sand, silt and silt-laden water, it does not enter the natural water resources. • Excavated material is should be placed on the upstream side of the trench so that should any excavated material be displaced during rainfall; it will flow back into the trench rather than towards the watercourse Refer to EMPr for further mitigation measures
	Heritage	Significance after mitigation	Proposed mitigation
	Potential impact on historically significant structures	Low (Negative)	• Maintain a buffer zone of at least 10m to separate the old railway bridge of metal and concrete at coordinates (28º 45' 24.7″ S 20º 37' 12.2" E) from the proposed pumphouse supply line to WTP. • Maintain buffer zone of at least 15m X 20m between development proposal and old stone-walled house of granite located at (28º 44' 26.3"S, 20º 33' 28.8"E) in close proximity to an existing farmhouse
	Potential impact on Graves	Low (Negative)	• The cemetery at KSS/1500/F/19/006 is located approximately 10m north of an existing road and the proposed Augrabies main supply line. A 15 x 30m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection. • The cemetery at KSS/1181/008 is located approximately 11 m south of an existing road. A 20m x 25m no-go buffer is therefore recommended around the cemetery, and the cemetery should be fenced off to ensure its protection. • The cemetery at KSS/176/004 is located approximately 65 m west of

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection. • The cemetery at KSS/399/19/007 is located approximately 107m west of an existing road. Although no direct impact is anticipated, a precautionary buffer zone should be implemented to manage potential risks associated with heavy vehicle and equipment movement. A 50 m precautionary no-go buffer is therefore recommended around the cemetery, and the site should be fenced off to ensure its protection. • The cemeteries should be demarcated and avoided by personnel and equipment.
	Palaeontology	Low (Negative)	• If Palaeontological resources are uncovered on the proposed site, the Chance Find Protocol must be implemented immediately. Fossil discoveries must be protected and the ECO/site manager must report to the South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out. • Before any fossil material can be collected from the development site, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). .
	Agriculture	Significance after mitigation	Proposed mitigation
	Loss of future agricultural production potential.	Low (Negative)	• No high-value or perennial crops (e.g. table-grape vineyards, orchards, date palms) may be disturbed. Routes must be micro-sited around such crops; where unavoidable, alignment must follow existing road reserves, farm tracks or servitudes.

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• Construction must be confined to a working width of 10m. No stockpiling, turning or laydown outside the demarcated corridor • Topsoil (upper horizon) must be stripped separately, stockpiled apart from subsoil, and replaced in original sequence on backfill to preserve the soil profile and rooting medium. This should only be implemented on soils deeper than 500mm which is not expected to be much in the area. • Trenching across irrigated land should, where practicable, be scheduled outside peak growing and harvest periods to limit production loss. • Disturbed land must be re-contoured, decompacted (ripped) and re-established so that it returns to its pre-construction agricultural state within two years of completing construction • Compaction caused by machinery must be relieved across the trench line; cross-drainage and irrigation furrows interrupted during construction must be reinstated • Disturbed soil must be monitored and cleared of declared weeds and alien invasive species during the rehabilitation period.
	Visual	Significance after mitigation	Proposed mitigation
	Site may not be aesthetic amid natural background.	Low (Negative)	This impact cannot be avoided. Mitigation measures as per the EMPr.
	Noise	Significance after mitigation	Proposed mitigation
	Noise will be generated during the construction phase.	Low (Negative)	• Any noise generated by construction activities will be a temporary impact however, the following mitigation measures will be implemented: • A complaint register to be maintained on-site. Any complaints received must be responded to and rectified accordingly. The ECO must be notified of any complaints.

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
			• All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors. • Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00).
	Dust	Significance after mitigation	Proposed mitigation
	Dust will be generated during the construction of the proposed development.	Low (Negative)	The following mitigation measures must be implemented: • Stockpiled material must be covered with a plastic sheet, tarp or similar material in windy conditions; • The proposed site and the gravel roads leading to the proposed site must be sprayed with water to reduce construction related dust;
	Indirect impacts:		
	Socio-economic	Significance after mitigation	Proposed mitigation
	• Enhanced supply of bulk municipal water • Creation of employment opportunities and enhancement of business opportunities for building supplies companies.	High (Positive)	Mitigation is not required
	Traffic	Significance after mitigation	Proposed mitigation
	Increase in trucks and other construction vehicles.	Low (Negative)	• The site must be made easily accessible to all construction traffic travelling along main routes; - • If required, point's men must be in attendance to direct traffic when heavy vehicles are accessing or leaving the site to ensure that there are no accidents.
	Cumulative impacts:		
	Biodiversity	Significance after mitigation	Proposed mitigation
	Cumulative impact associated with proposed activity.	Low (Negative)	As above Biodiversity impact mitigation measures
	Freshwater Resources	Significance after mitigation	Proposed mitigation

Alternative 2 (Least preferred alternative)			
Activity	**Impact summary**	**Significance**	**Proposed mitigation**
	Orange and Hartbees River conservation value considering the extent, duration, severity and likelihood of impact	Low (Negative)	As above freshwater mitigation measures
	Drainage lines conservation value considering the extent, duration, severity and likelihood of impact	Low (Negative)	As above freshwater mitigations
	Heritage	Significance after mitigation	Proposed mitigation
	Cumulative impact associated with proposed activity.	Low (Positive)	Cumulatively, there will not be a drastic loss to heritage resources for the region if the recommended impact mitigation measures contained in the EMPr are adhered to. The heritage resources recorded during the assessment add minimal understanding of the wider archaeological, historical, and cultural landscape, even though they are site-specific.
	Socio-economic	Significance after mitigation	Proposed mitigation
	Enhanced supply of bulk services	Low (Positive)	No mitigation required.
	Smell	Significance after mitigation	Proposed mitigation

No-go option			
	Direct impacts:		
	This would mean abandoning the proposal of upgrading the BWS for Kakamas and the nearby surrounding villages and the proposed site would remain in its current state. The water cuts that residents of the area frequently endure for two to three days at a time	High (Negative)	Adopt the Preferred alternative or the less preferred alternative

	would continue and probably worsen as the population grows and increases the water demand..		
	Indirect impacts:		
	Cumulative impacts:		

A complete impact assessment in terms of Regulation 19(3) of GN 733 must be included as Appendix F.

1. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative 1 (Preferred Alternative)

The upgrading of the BWS will assist in ending the water supply cuts that residents in Kakamas and the nearby surrounding villages frequently endure for up to three days at a time as a result of the current water supply that is significantly outstripped by the water demand and the state of disrepair of the existing BWS was last upgraded in 1987 to remain reliable for only another approximately 20 years. In addition, the upgrading of the BWS will provide employment opportunities during the construction phase, thereby helping to alleviate the unemployment situation in the area. The construction phase will also enhance business for building materials suppliers and benefit the local economy.

The potential negative impact on terrestrial biodiversity for the proposed upgrading of the BWS is Low upon implementation of the relevant impact mitigation measures (Appendix D1, refers). The overall potential impact on terrestrial biodiversity is lower in the case of the Preferred Alternative than in the case of both the less preferred alternative and the least preferred alternative, as the Preferred Alternative entails the Augrabies Village water supply pipeline remaining within road reserves more than is the case with the other two altenatives. However, the potential impact on plant species of conservation concern is higher in the case of the Preferred Alternative than in the case of the least preferred alternative. This is as a result of a higher number of plant species of conservation concern existing in close proximity to the route of the proposed pipeline that delivers potable water to the Augrabies Village in the reserves of the N14 National Road and R359 Regional Road than in the case of the least preferred alternative. The careful on-site placement of the pipeline away from plant species of conservation concern within the road reserves will greatly assist in keeping the potential harm to the protected plants minimal when the Preferred Alternative is implemented. The unavoidable impact on protected plants will be kept as low as possible by the implementation of the impact mitigation measures detailed in the EMPr (Appendix G, refers).

The potential negative freshwater ecological impacts relating to the proposed upgrading of the BWS are Low upon implementation of the relevant impact mitigation measures (Appendix D2, refers). The freshwater ecological impacts are significantly lower in the case of the Preferred Alternative than in the case of the least preferred alternative. This is as a result of the proposed pipeline that delivers water to the Augrabies Village traversing watercourse reaches that are much more transformed by human activities in the case of the Preferred Alternative than in the case of the least preferred alternative.

The proposed Augrabies Village water supply pipeline remains mostly within existing road reserves and traverses fewer private properties than in the case of the less preferred alternative and these traversed private properties are even fewer than in the case of the least preferred alternative. It will therefore be less onerous to register the necessary servitudes for the proposed pipeline in the case of the Preferred Alternative than in the case of the less preferred alternative and even less onerous than in the case of the least preferred alternative.

In view of the above, the likely benefits of the proposed upgrading of the BWS far outweigh the potential negative impacts and therefore the proposed upgrading of the BWS should be authorised by the competent authority. Furthermore, it is the Preferred Alternative that should be authorised, as the Preferred Alternative is associated with significantly lower overall negative potential impacts than the less preferred alternative and significantly lower negative potential impacts than the least preferred alternative.

Alternative 2 (Least preferred alternative)

The upgrading of the BWS will assist in ending the water supply cuts that residents in Kakamas and the nearby surrounding villages frequently endure for up to three days at a time as a result of the current water supply that is significantly outstripped by the water demand and the state of disrepair of the existing BWS that was last upgraded in 1987 to remain reliable for only another 20 years. In addition, the upgrading of the BWS will provide employment opportunities during the construction phase, thereby helping to alleviate the unemployment situation in the area. The construction phase will also enhance business for building materials suppliers and benefit the local economy.

The potential negative impact on terrestrial biodiversity for the proposed upgrading of the BWS is Low upon implementation of the relevant impact mitigation measures (Appendix D1, refers). The overall potential impact on terrestrial biodiversity is higher in the case of the least preferred alternative than in the case of the other two alternatives, as the least preferred alternative entails the Augrabies Village water supply pipeline traversing a much bigger area of natural vegetation. However, the potential impact on plant species of conservation concern is lower in the case of the least preferred alternative than in the case of the other two alternatives. This is as a result of a higher number of plant species of conservation concern existing close to the proposed Augrabies Village water supply pipeline in the reserves of the N14 National Road and R359 Regional Road than along the pipeline route in the case of the least preferred alternative.

The potential negative freshwater ecological impacts relating to the proposed upgrading of the BWS are Low upon implementation of the relevant impact mitigation measures (Appendix D2, refers). However, the freshwater ecological impacts are significantly higher in the case of the least preferred alternative than in the case of the other two alternatives. This is as a result of the proposed pipeline that delivers water to the Augrabies Village traversing watercourse reaches that are much more transformed by human activities in the case of the least preferred alternative than in the case of the other two alternatives.

The proposed Augrabies Village water supply pipeline traverses many more private properties than in the case of the least preferred alternative than in the case of the other two alternatives. It will therefore be much more onerous to register the necessary servitudes for the proposed pipeline in the case of the least preferred alternative than in the case of the other two alternatives.

In view of the above, the likely benefits of the proposed upgrading of the BWS far outweigh the potential negative impacts and therefore the proposed upgrading of the BWS should be authorised by the competent authority. Furthermore, it is clear from the above that the least preferred alternative is associated with the most significant disadvantages and is therefore the least desirable alternative for the competent authority to consider authorising.

Alternative 3 (Less preferred alternative)

The upgrading of the BWS will assist in ending the water supply cuts that residents in Kakamas and the nearby surrounding villages frequently endure for up to three days at a time as a result of the current water supply that is significantly outstripped by the water demand and the state of disrepair of the existing BWS that was last upgraded in 1987 to remain reliable for only another 20 years. In addition, the upgrading of the BWS will provide employment opportunities during the construction phase, thereby helping to alleviate the unemployment situation in the area. The construction phase will also enhance business for building materials suppliers and benefit the local economy.

The potential negative impact on terrestrial biodiversity for the proposed upgrading of the BWS is Low upon implementation of the relevant impact mitigation measures (Appendix D1, refers). The overall potential impact on terrestrial biodiversity is higher in the case of the less preferred alternative than in the case of the Preferred Alternative. This is as a result of the Augrabies Village water supply pipeline on the side of Truter Road traversing areas of natural vegetation outside of road reserves to a greater extent than in the case of the Preferred Alternative.

The potential negative freshwater ecological impacts relating to the proposed upgrading of the BWS are Low upon implementation of the relevant impact mitigation measures (Appendix D2, refers). The freshwater ecological impacts are significantly lower in the case of the less preferred alternative than in the case of the least preferred alternative. This is as a result of the proposed pipeline that delivers water to the Augrabies Village traversing watercourse reaches that are much more transformed by human activities in the case of the less preferred alternative than in the case of the least preferred alternatives.

The proposed Augrabies Village water supply pipeline traverses fewer private properties in the case of the less preferred alternative than in the case of the least preferred alternative. It will therefore be much less onerous to register the necessary servitudes for the proposed pipeline in the case of the less preferred alternative than in the case of the least preferred alternatives.

It must be conceded that the Augrabies water supply pipeline is shorter in the case of the less preferred alternative than in the case of the other two alternatives and that this makes the less preferred alternative more financially attractive. However, the financial savings alone do not outweigh how onerous it will be register servitudes for the pipeline on more private properties in the case of the less preferred alternative and how the less preferred alternative entails clearing vegetation outside of road reserves to a greater extent than n the case of the Preferred Alternative.

In view of the above, the likely benefits of the proposed upgrading of the BWS far outweigh the potential negative impacts and therefore the proposed upgrading of the BWS should be authorised by the competent authority. Furthermore, it is clear from the above that the less preferred alternative is associated with more disadvantages of significance than the Preferred Alternative. The less preferred alternative is therefore not as desirable as the Preferred Alternative for the competent authority to consider authorising. However, the less preferred alternative is indeed more desirable for the competent authority to consider authorising than the least preferred alternative.

No-go alternative (compulsory)

This alternative entails abandoning the proposal to upgrade the BWS for Kakamas and the nearby surrounding areas and allowing the proposed site to remain in its current state.

It is noteworthy that the existing BWS was last upgraded in 1987 and the lifespan of the BWS was approximately 20 years. Furthermore, the population of the area has grown significantly since1987 and this has significantly increased the water demand. The residents of the area frequently endure up to three days at a time without piped municipal water and this situation is likely to worsen as the population continues to grow and increase the water demand.

The ‘no-go’ alternative is clearly the most undesirable alternative, especially considering that authorising the Preferred alternative or any of the other two alternatives will assist in ending the water supply shortages in Kakamas and the surrounding nearby villages at present and well into the future and that the potential negative impacts of the authorised development are likely to remain Medium to Low upon the implementation of the impact mitigation measures contained in the EMPr.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	~~YES~~	**NO**

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

The Draft BAR must first be made available to Interested and Affected Parties for public participation as per the EIA Regulations of 2014 (as amended). The comments received during the public participation process must then be responded to adequately in a Comments-Responses Report and taken into account in the BAR before the BAR can be submitted to the competent authority for a decision on the application.

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

- All construction must take place in accordance with an approved construction and operational phase Environmental Management Programme (EMPr).
- A suitably experienced ECO must be appointed to ensure compliance with the conditions of the environmental authorisation and the EMPr.
- The recommendations contained in the Terrestrial Biodiversity Impact Report attached hereto as Appendix D1 must be implemented, except the recommendation of establishing the Augrabies Village water supply pipeline in keeping with the less preferred alternative.
- The recommendations contained in the Freshwater Impact Study Report attached hereto as Appendix D2 must be implemented, except for the recommendation of using horizontal unidirectional drilling when the pipelines of the proposed upgraded BWS traverse watercourses.
- The recommendations contained in the Heritage Impact Report attached hereto as Appendix D3
- The recommendations contained in the Agricultural Study Report attached hereto as Appendix D4
- All the conditions contained in the environmental authorisation must be complied with.

Is an EMPr attached?	**YES**	~~NO~~

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

Maboee Nthejane
NAME OF EAP

_____	_____
SIGNATURE OF EAP	DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information