PROPOSED TOWNSHIP DEVELOPMENT, PLOT 1890, REMAINDER OF FARM 144 AND REMAINDER OF FARM 142, BOEGOEBERG, !KHEIS LOCAL MUNICIPALITY

APPLICANT: !Kheis Local Municipality

COMMENT AND RESPONSE REPORT

(DENC Ref. No: NC/EIA/12/ZFM/!KHE/BOE1/2020)

No.	Comment Date, Comment Format, Organisation/I&AP	Comment	Response from EAP/Applicant/Specialist/Project Manager
Comment on Initial Public Participation			
1	**Date:** 17/06/2020 **Format**: Email Letter **I&AP:** Gariep Watch (Chairman: Mr Ferdie Botha/ Technical Advisor: Mr Fritz Bekker)	Gariep Watch is a civic society organisation that endeavours to protect the lower Orange River through effective monitoring and data collection, improved communication by role-players and the enhancement of public participation. We noted your abovementioned NEMA Public Participation Process (Ref. 0512) for a new township development at Topline, with much concern.	**Respondent: EAP** Noted. Thanks for your comment.
		Gariep Watch performs quarterly water quality studies and a risk assessment procedure at various localities in the lower Orange River including the river reach flowing through the !Kheis Local Municipalities jurisdiction. Our water quality results show that a number of point and diffuse sources of sewerage pollution may be affecting the surface and ground water resources in the vicinity of these townships and beyond. Furthermore, recent site visits to sewerage water infrastructure at these !Kheis townships showed that much of the sewerage water infrastructure is not being maintained or used for it intended purpose. Pump stations to the oxidation dam systems are not working, sewerage infrastructure is being vandalized, oxidation dam linings are damaged or removed and raw sewerage is being disposed into the veld or towards dry water courses.	**Respondent: EAP** Noted. Current water supply, sewage and solid waste management issues have been identified and detailed in the Engineer's Services Report (Appendix 4B). Construction and upgrades to existing sewage management infrastructure has been recommended by the Engineer to service the proposed development.

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		The photographs in Figure 1 show some of the oxidation dam systems encountered at !Kheis Local Municipality during 2019.  Figure 1: Oxidation dam systems at !Kheis Local Municipality (2019) The extension of existing townships that already have inadequate, unmaintained or unused sewerage infrastructure will only aggravate their pollution risk towards the downstream environment. We therefore object to any new township development in the !Kheis Local Municipality and request the following information: 1. A list of all new proposed township developments in the !Kheis Local Municipality where EnviroAfrica CC is the appointed environmental practitioner. 2. Details pertaining to new sewerage infrastructure that are planned for these developments.	1. *Requested information has been sent to the I&AP.* 2. Noted. Please refer to the Engineer's Services Report (Appendix 4B) regarding recommended construction / upgrade to existing sewage infrastructure. Recommended sewage infrastructure as per the Engineer's Services Report (Appendix 4B) for the proposed development includes; • Construction of two (2) new sewer pump stations capable of delivering 26.4 l/s and 15.7 l/s, respectively direct to the Waste Water Treatment plant. Self priming centrifugal pumps to be used.

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			• Construction of two (2) new Huber screens at both Sewer Pump stations. • New 250mm diameter pipelines (1610m) between the pump station no. 1 and the Waste Water Treatment Plant. • New 200mm diameter pipelines (450m) between the pump station no. 2 and the new rising main from pump station no. 1. • Construction of a 80m x 160m Oxidation Pond.
		Please also register Gariep Watch as an I&AP for these new township developments.	Noted, Gariep Watch has been registered as an I&AP.
2	**Date:** 19th May 2020 **Format**: Email Letter **I&AP:** Kobus Buys (KYTO Operations)	1. Herewith our registration as I&AP to abovementioned. 2. Information of our company as follow : Name : KYTO Operations (Abattoir located next to development) Address: Portion 16 of Farm Boegoeberg Settlement no.46 Contact Details: kobus@k2o.co.za or 054-8330041	**Respondent: EAP** Noted. KYTO Operations have been registered as an I&AP.
3	**Date:** 29th June 2020 **Format**: Email Letter **I&AP:** Maryna Heese	We Daniel, Friedrich Johan Heese of ID 5804195040084 and Maryna Heese of ID 5910030127083 owners of Lot 586 and 1464, part of Lot 1028 of the Boegoeberg Settlement, would like to register as Interested &Affected Parties regarding the proposed Township Development. We would like to affirm our personal and financial interest in the development. Kindly contact us on the following e-mail addresses: marynaheese@gmail.com and dh58zar@gmail.com. This is our preferred avenue of communication.	**Respondent: EAP** Noted. You have been registered as an I&AP.
4		As Interested and Affected individuals we like to comment on the new Township referenced above. Your company name allowed me to have hope that behind this new development we might find a group of people that earnestly are interested in developing a sustainable environment. The words in quotation marks come from a study of the use of earth-pipes to cool air.	**Respondent: EAP** Noted with thanks. This application for Environmental Authorisation is in line with the National Environmental Management Act (NEMA).

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		"Rational use of energy and power is a key to the economic development of human society and to achieve sustainable environment." https://www.sciencedirect.com/science/article/pii/S1876610214032664 Some areas for consideration is cooling and heating of houses in an area known for very hot summers and very cold winters. If the energy exerted in digging trenches for pipes, that will form part of the water reticulation infrastructure can double up for eco-friendly earth cooling and heating systems as explained in the above link, it can be a worthwhile economic model. I am hoping that an overarching management function will form part of the project and that all these elements of development can be co-ordinated, overseen and all opportunities to incorporate cost-effective and ecologically sustainable solutions utilized. For example, when the foundations for homes are being dug, the alternative cooling systems installed. Boegoeberg development can become a pilot project for arid community development. Parks, Sport and recreational space, bigger plots and proper roads are some other concerns. I do not have any experience in the above, but do have experience in waterless sanitation options. I have compiled some thoughts, experience from others and links pertaining to waterless sanitation for your consideration. Do forgive me if the sanitation document is far too simplistic or lay-men orientated, but I have no idea who will read this letter and the document. Interested and Affected Individuals, from lot 586/and 1464 that from part of lot 1018, as part of the Boegoeberg Community, one of the closest lots to the new proposed Township. Kind regards Daniel and Maryna Heese	Noted. Thank you for your research into the subject. An Engineering Report detailing existing and recommended services, has been appended as Appendix 4B. Noted. Thank you for your comment.
5		Regarded members of the Municipality, Re. Toilets	**Respondent: EAP**

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		I would like to share some thoughts with you regarding the proposed new development. 1. TOILETS. We live in a water-scarce country and the water-sources needed to have flush toilets is simply not sustainable in the long run. I have been involved with a KZN NGO in a deep rural area of South-Africa in the Umkhanyakude District. We also have severe water challenges. We in collaboration with Oxfam Australia experimented with alternatives to Flush toilets and Long-Drop Pit latrines. That was my first introduction in waterless technology. We tested two models, one a commercial self-contained unit from Enviro-loo (pictured below) that was costly and a combination of a urine-diversion seat with self-constructed chamber options. I am happy to share our limited experience with you, but highly recommend the far superior functioning model for thousands of people, that can be found with Durban Municipality (eThekwini Municipality). They had been busy with waterless sanitation technology for over 12 years. I have supplied links to websites that explain technically on various levels, **the challenges faced with introduction,** the success and the research done with various options. So I have pasted both the success and failures and the reason for the failures. 2. I will attempt to explain in layman's terms the principle behind different sanitation systems. • In pit latrines the urine and faeces are mixed and seepage into the groundwater a reality. Apart from its environmental danger, it is often times not accepted as an option and seen as an insult to a person's humanity. The aspiration of the average person is for a flush toilet as shown in some or the articles in the websites quoted. • Flush toilets in a water-scares country is not a long term solution in any community and all communities should re-consider the cost of using cleaned water to flush toilets. • Ablution blocks for communal use of facilities is not an option. Most people would not feel safe to walk to a communal ablution at night and	Noted with thanks. The Engineer's Service Report (Appendix 4B) has made recommendations on the construction / upgrades to existing sewage infrastructure to service the proposed development.

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		I personally feels that dealing with your own bodily waste and household waste makes us responsible humans. • Urine separating systems. An extract from a document The UDDTs provide the following benefits: (1) waterless operation; (2) no odour when correctly used and maintained; (3) treated faecal matter is dry, odourless and less offensive; (4) does not attract flies or other vectors; (5) treated faecal matter is partially sanitised and safer to handle; (6) aboveground design or use of containers in belowground vaults makes emptying simple; (7) minimal risk of contamination of ground and surface water resources; (8) possibility of aboveground design facilitates construction in challenging environments; and (9) possibility of construction in close proximity to or inside of the home adds security and convenience for users (Rieck *et al.* 2012). https://iwaponline.com/washdev/article/7/1/111/30518/Urine-diversion-dry-toilets-in-eThekwin URINE SEPERATING TOILETS. This is the system I would like to propose. Separating urine from faeces allows the faeces to **dry out completely**, **killing pathogens (harmful micro-organisms) and make it manageable.** The faeces dries like dog poop in the sun and become small and brittle and whitish. Because it is a waterless system, water is used for household and garden growing. There are various methods to separate urine and faeces. **1. ENVIRO-LOOS** The **Enviro loos** system allow both urine and faeces to enter the chamber together and then the content falls on a sloped perforated surface…a hard plastic sheet with holes at an angle, that allows the urine to seep through the holes into the bottom enclosed chamber, with a pipe that leads to a urine soak-away pit nearby. The faeces then dries out, needs to be raked to the back of the box from time to time and then the hard dry faeces needs to be collected after a year or more to be disposed of. The challenge with this system is that the holes can block and the angle is not steep enough for the faeces to slide down. They	

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		remain wetter longer and there is an extraction fan at the top of the chimney to eliminate most smells. It needs a **full sun site**, additional **power for the extraction fan** and people living higher might still get a whiff from the extraction fans, but the biggest deterrent is possibly the **cost, it is more expensive**. It is the best application for schools and community halls as seen in the photo below. The two glass tops are for the urinals. It is a very good method of coping with the urine. The urine dries into crystals. https://www.greenloo.org/enviro-loo-urinal.php **2. URINE SEPERATION TWO CHAMBER SYSTEM** a. An attempt is made to **separate urine from faeces before the faeces drops down** the seat. It is important for the success and acceptance of the systems to buy white high **quality urine separation pedestals/seats.** As can be seen in the photo below the system can be incorporated into the bathroom. It is advised to incorporation of a urinal against the wall in the blue bathroom picture as well. The urine can be collected in the same container the seat urine is diverted to. b. **Build a two chamber system**. Faeces are collected in one chamber until it is full, the seat is then removed and placed over the new empty chamber. The seal of the empty chamber is placed over the full chamber. The full chamber is left like it is until the second chamber is almost full. By now the faeces should be dried out. The dried out faeces is accessed through the sealed back wall and either disposed of or ground up and used as fertilizer in agricultural applications. The municipality can collect and dispose of the dried faeces. c. The selection of the site: It is vital for the optimal drying of the faeces that the back wall of the bathroom **unit face North**. To increase the absorption of the sun rays the back panel and the chimney should be painted black or be manufactured from hard black plastic. Place a mosquito net above the chimney. The bigger the chimney the greater the up draft and reduced smell.	

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		d. The **urine can be diverted to a soak away, or a solar evaporation** site similar to the environ system or utilized in a diluted form in agriculture. It is important to be aware of the hesitance of local communities to use human waste in any form as part of a greater agricultural system and extensive community awareness activities should accompany such use. e. By placing a **bucket of sand, ash or sawdust** next to the toilet with a little scoop, visual unpleasantness and smell will be further reduced. In addition, the material like ash or sand can accelerate the drying time. f. Should flies find their way into the system, they would try to get out and the only light will be at the top of the chimney that is sealed with a mosquito net. The **flies will then fly up and down the chimney until they die**. It is highly unlikely if the seat remains closed. In the image above the toilet stool is a porcelain seat, that can also stand on its own, going straight downward without the u-trap of standard toilet seats. To the right on the photo is a urinal, for the use of men, with an outlet that joins the urine caught with the separate division in the seat. This photo was sourced form https://en.wikipedia.org/wiki/Urine-diverting_dry_toilet, an example from Peru. This is what a urine separation seat can look like. The front chamber catches the urine and the dark blue is where the faeces drops down into the chamber. In this photograph there is a division that is not there. It is a pipe that have straight sides. This is local, South-African manufactured urinals on the market. It is advisable that the pipes should take the shortest route out, but protected from sun and damage. Additional resources: 1.http://www.wrc.org.za/wpcontent/uploads/mdocs/Demonstrating%20New%20Sanitation%20Solutions%20through%20the%20Engineering%20Field%20Testing%20Platform%20in%20eThekwini.pdf	

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		This is a very comprehensive study for waterless Sanitation options as done in eThekwini (DURBAN) 2. http://www.susana.org/_resources/documents/default/2-874technology-review-of-uddts-18-june-2013.pdf A comprehensive document filled with options and diagnostic fault finding. 3.https://iwaponline.com/washdev/article/7/1/111/30518/Urinediversion-dry-toilets-in-eThekwini Introduction challenges faced in eThekweni (Durban) 4.http://ccaa.irisyorku.ca/2011/07/flushing-out-the-realities-of-urine-diversion-toilets-in-south-africa%E2%80%99s-ethekwini-municipality/ 5. https://researchspace.csir.co.za/dspace/handle/10204/839 6. https://www.fsmtoolbox.com/assets/pdf/269_-_Complete.pdf 7. https://www.greenloo.org/enviro-loo-urinal.php	

Respondent: !Kheis Local Municipality Response on Initial PP (Appendix 3E.1.9)

!Kheis Municipality exercises its executive functions within its boundaries in terms of Section 151 of the Constitution of the Republic of South Africa as a local authority. As such the Constitution enjoins the Municipality to adhere to the objectives in accordance with Section 152 and the development within its boundaries in terms of Section 153.

The Municipality must exercise its rights and duties in terms of Section 4 of the Municipal Systems Act 32 of 2000 to ensure that the communities are consulted properly and that the needs are addressed. To fulfil these obligations the Municipality consulted the community annually to compile the master strategic plan (Integrated Development Plan).

The need for housing within the Municipality is currently critical and needs to be addressed. Some of the applicants are on a waiting list for a house since 2013. It is essential to ensure that these people on the backlog list be assisted to restore dignity and fulfil the obligations as a local authority. The consolidated respond of !Kheis Municipality on the comments from various individuals and organizations on the housing projects are as follows:

1. The purpose of the whole exercise is to obtain correct information from professionals to address the shortcomings and comply with legislation to render basic services to our communities.

2. That this Council adhere to the call of its poor residents to avail land for housing purpose.

3. The Technical reports will address the needs and will serve as business plans to obtain financial support from Government institutions.

3. To obey to the course of restoring dignity to poor people and correct the imbalances of the past.

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Comments Received on Draft Scoping Report			
6	**Date:** 28th August 2020 **Format**: Email Letter **I&AP:** SAHRA	Interim Comment: SAHRA requires the draft EIA documents before further comments can be issued. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.	**Respondent: EAP** Noted, thank you. The draft EIR will be made available to SAHRA for comment.
7	**Date:** 1st October 2020 **Format**: Email Letter **I&AP: Gariep Watch**	The July 2020 EnviroAfrica draft Scoping Report and Plan of Study for the above-mentioned development has reference. Thank you for registering Gariep Watch as an Interested and Affected Party and incorporating our correspondence of 17 June 2020 in the draft Scoping Report. This letter highlighted our concerns that pertain to the lack of wastewater infrastructure and maintenance of existing infrastructure at the !Kheis local municipality. We agree that housing is necessary to promote socioeconomic development and to provide the basic needs of the Brandboom community. However, the process of urbanization and population growth, if not handled carefully, may result in increased surface and ground water pollution towards the Orange River. Intensive urban growth far from job opportunities can also lead to greater poverty with local governments unable to provide services for all people. Gariep Watch takes note of the assertion in paragraph 6.2 of the draft Scoping Report that sewer availability and the capacity thereof will be investigated to determine whether new sewerage infrastructure is required. We also agree with the conclusion that an EIA will be required, including specialist biodiversity and freshwater assessments. Our further comments pertaining to this application are as follows:	**Respondent: EAP** Noted. Please refer to the Engineer's Services Report (Appendix 4B) stipulating recommended sewage infrastructure construction / upgrades to service the proposed development. Noted. As per the EMPr (Appendix H), the construction of the proposed development must comply with conditions stipulated in the EMPr, Specialist Reports, and the EA (if granted). This aids in avoiding, mitigation, and / or rehabilitating impacts (in accordance with the Mitigation Hierarchy) identified by the Specialists, EAP, and/ or I&APs. Noted. Please refer to the Engineer's Services Report (Appendix 4B). The Engineer's Services Report details existing (relative to water supply, sewage infrastructure, solid waste management, roads, electricity, and stormwater management) and recommended infrastructure to service the proposed development. Please note that the Botanical Impact Assessment (Appendix 6A), Heritage Impact Assessment (Appendix 6B), Freshwater Impact Assessment (Appendix 6C), and Geotechnical Investigation (Appendix 6D) have been apexed to the Draft EIR.
		1. The proposed 550 erven on 49 hectares next to the Brandboom settlement straddles two drainage lines. Plot 1890 covers the upper	1. Noted. Alternative design layouts, incorporating environmentally sensitive areas (including watercourses and botanical features as

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		50% of a dry watercourse and Farm 142 overlays the two main branches of a dry watercourse. No alternative development sites away from drainage lines have been identified in the draft Scoping Report. Changes to the site layout should be considered.	identified by the Freshwater Specialist and Botanical Specialist, respectively), have been appended as Appendices 2A-D. Design Alternative 4 (Appendix 2D) is the preferred layout and incorporates the aforementioned drainage lines – zoning these areas as Open Space II and Undetermined Zone. Therefore, this mitigates impacts associated with the proposed housing development in close proximity to the identified watercourses.
		2. These drainage lines close to a township development may be used for illegal dumping and ablutions with rainfall that washes pollutants to the nearest body of water, i.e. the Orange River. Stormwater contamination should be investigated with cognisance of the expected run-off from these catchments and new development areas. It should, however, be endeavoured to avoid any development close to watercourse.	2.Noted, please refer to response above. Illegal dumping was noted during the site visit and identified as an impact to watercourses and surrounding environment (e.g. Appendix 6C). Illegal dumping has been addressed in the Specialist Reports and Engineer's Services Report where a solid waste management plan should be compiled and implemented for the proposed development. Mitigation measures and recommendations stipulated by the Specialists and Engineer (and as included in the EMPr – Appendix H) must be complied with. In addition to parameters stipulated in the Engineer's Services Report (Appendix 4B), a Stormwater Management Plan (SWMP) must be designed and compiled to address concerns raised by the I&AP - namely the potential flow of sewage- and/or solid waste-contaminated stormwater runoff from the development into the drainage lines and subsequently the Orange River. Therefore, it is recommended that the proposed development be supported/ authorized subject to the compilation of a SWMP which includes required engineering parameters (Appendix 4B) and the management of potentially sewage- and/or solid waste-contaminated stormwater runoff.
		3. Raw sewerage is currently being disposed of in a dry watercourse next to the existing Brandboom settlement with the locality shown on Plate 1. Sewerage water mixes with stormwater run-off in an impoundment and overflows into the Orange River during rainfall events. Children also swim in this impoundment, which poses a serious risk to public health. The existing adverse impact pertaining to sewerage disposal should be addressed before embarking on any new developments.	3. Issues relating to water quality and sewerage infrastructure have been addressed in the draft EIR, Specialist Reports (Appendix 6A-D), and Engineer's Services Report (Appendix 4B). As per the Engineer's Services Report, the Engineer has detailed existing services capacity and recommended the construction / upgrade of sewage management infrastructure to service the proposed development. As per the Draft EIR, the proposed development is supported subject to the implementation of the recommended mitigation measures proposed by specialists, and stipulated in the EMPr, and the compilation and effective implementation of a waste management plan. In addition to parameters stipulated in the Engineer's Services Report (Appendix 4B), a Stormwater Management Plan (SWMP) must be designed and compiled to address concerns raised by the I&AP - namely the potential flow of sewage- and/or solid waste-contaminated stormwater runoff from the development into the

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		 **Figure 2. Sewerage disposal site in drainage line.**	drainage lines and subsequently the Orange River. Therefore, it is recommended that the proposed development be supported/ authorized subject to the compilation of a SWMP which includes required engineering parameters (Appendix 4B) and the management of potentially sewage- and/or solid waste-contaminated stormwater runoff.
		4. Ground water quality down-slope from the proposed development and the existing settlement should be investigated. It is believed that, in the absence of adequate wastewater services at Brandboom, much sub-surface pollution may reach neighbouring boreholes. These down-slope boreholes are being used for irrigation, livestock watering and potable purposes and may pose a serious risk to public health.	4. Noted. Existing capacity of services have been detailed in the Engineer's Services Report as well as recommendations for the construction / upgrade to sewage management infrastructure to service the proposed development.
		5. Paragraph 2.2.2 on p. 10 of the draft Scoping Report states that the proposed development will tie in with the existing services. It is put forward that the existing wastewater services are inadequate and are inefficiently maintained. New infrastructure should be designed, built and maintained to prevent any sewerage water from polluting the groundwater or Orange River.	5. Noted. The Engineer's Services Report (Appendix 4B) have detailed the existing status/ condition of services infrastructure as well as recommended construction / upgrade to the existing services to service the proposed development. The capacity of existing services (water supply, sewage management, solid waste management, electricity, roads, and stormwater management) have been detailed in the Engineer's Services Report. The Engineer has recommended construction / upgrade to existing services which may be required should the proposed development be authorised.

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		6. River health indices as noted in Part 7.2 of the draft Scoping Report will not be feasible on the ephemeral drainage lines but could be conducted in the Orange River up-stream and down-stream from the proposed development.	6. Noted. Watercourses present within the proposed development footprint are non-perennial watercourses which are mostly dry throughout the year. The Freshwater Impact Assessment (Appendix 6C) includes biomonitoring of the Orange River at different sampling points. As per the Freshwater Assessment, biomonitoring was conducted at eleven (11) sampling points along the Lower Orange River, namely Augrabies Lair trust, Groblershoop, Kakamas Triple D, Hopetown Sewer, Hopetown Sewer, Keimoes Housing, Upington Erf 323, Upington Affinity, Styerkraal, Grootdrink Bridge, and Turksvy Dam. These sites were sampled based on elucidating the combined impact of the propose developments on the Orange River. Biomonitoring was carried out according to the description of Dickens and Graham, (2002). Impacts on the Orange River, associated with the proposed development, have been included in the Freshwater Assessment.
		The Orange River is used for many purposes downstream from this development, including potable use by communities, often directly from the river and without treatment. All necessary measures must be put in place to prevent pollution from entering the Orange River.	Noted. Mitigation measures, as per the Specialist Reports (Appendices 6A-D), have been included in the EMPr and Draft EIR. These mitigation measures, as well as conditions of the Environmental Authorisation (should the EA be granted) must be complied with.
Acceptance / Approval of Final Scoping Report			
8	**Date:** 11th December 2020 **Format**: Email Letter **I&AP: DENC (Mr. Olebile Seshupo (Case Officer)**	The final scoping report for the Environmental Impact Assessment which was submitted by you in respect to the above-mentioned application and received by the Department in 11th October 2020 has been accepted by the Department. You may accordingly proceed with the undertaking of the environmental impact assessment in accordance with tasks that are outlined in the plan of study for environmental impact assessment.	**Respondent: EAP** It is noted that the Final Scoping Report has been accepted / approved. The next phase is to submit the Draft EIR (this report) and notify the registered I&APs of the availability of this report for comment.
9		I would like to also highlight two things, one being that a traffic impact assessment be conducted for all the proposed townships that are adjacent to the N10, also liaise with the Traffic Department for any comments or recommendations. Secondly, please include biodiversity impact assessment on all the proposed townships so that both fauna and flora are assessed. The reason for this is because I have noticed that in some instances you have only mentioned botanical impact assessment which will only focus on vegetation/plants.	**Respondent: EAP** Noted. Please note that the proposed development is not located adjacent to the N8 or N10. Letter submitted to the Department of Road and Public Works (DRPW) has been attached as Appendix 3E.2.1 and response from DRPW as Appendix 3E.2.2. The undertaking of a Traffic Impact Assessment (TIA) must be made a condition on granting the Environmental Authorisation. Please note that the fauna (and avi-fauna) information has been included as part of the Botanical Assessment (Appendix 6A) – detailing the overall biodiversity of the proposed site for development.

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Comments Received on Draft EIR			
10	**Date:** 26th February 2021 **Format**: Email Letter **I&AP: Gariep Watch**	Gariep Watch reviewed the draft Environmental Scoping Reports as part of the public participation process and commented on each separate report on 22 September 2020. We note with disappointment that all our comments have not been incorporated into the specialist reports or draft EIR's. These raised issues remain unresolved. Our further comments on the draft EIR's have been narrowed down to apply to all six of these development proposals, and are provided below:	Thank you for your comments. Please note that issues raised by the Gariep Watch were addressed in the Draft EIR. **It must be further noted that this application is for the proposed housing development and <u>not</u> for the authorisation of a WWTW – in light of this, should the EA be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW.** Please see following for summary of responses to previous comments raised: 1. Findings of the Specialists, EAP and the Municipality were considered with regards to design alternative layouts (Appendix 2A-D). Design Alternative 4 (Appendix 2D) is the preferred layout and incorporates the aforementioned drainage lines – zoning these areas as Open Space II and Undetermined Zone and therefore, mitigating the impacts associated with the proposed housing development in close proximity to the identified watercourses. Moreover, proposed mitigation measures relative to the construction and operational phases have been included in the Final EIR, Specialist Reports and the EMPr, which must be complied with. 2. Illegal dumping was noted during the site visit conducted by the EAP and Specialists. Illegal dumping was identified as an impact to watercourses and surrounding environment (e.g. Appendix 6C) and mitigation measures were proposed. Illegal dumping has been addressed in the Specialist Reports and Engineer's Services Report where a solid waste management plan was recommended to be compiled and implemented for the proposed development as a condition should the EA be granted. Mitigation measures and recommendations stipulated by the Specialists and Engineer (and as included in the EMPr – Appendix H) must be complied with. 3. Issues relating to water quality and sewerage infrastructure have been addressed in the draft EIR, Specialist Reports (Appendix 6A-D), and Engineer's Services Report (Appendix 4B). As per the Engineer's Services Report, the Engineer has detailed existing services (including water supply, sewage

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			management, solid waste management, electricity, roads, and stormwater management) capacity and recommended the construction / upgrade of sewage management infrastructure to service the proposed development. As per the Draft EIR, the proposed development is supported subject to the implementation of the recommended mitigation measures proposed by specialists, and stipulated in the EMPr, and the compilation and effective implementation of a waste management plan. This waste management plan would include the construction of a Wastewater Treatment Works with the capacity to service the current and proposed housing development. 4. Watercourses (non-perennial watercourses) present within the proposed development footprint are mostly dry throughout the year. The Freshwater Impact Assessment (Appendix 6C) includes biomonitoring of the Orange River at different sampling points. As per the Freshwater Assessment, biomonitoring was conducted at eleven (11) sampling points along the Lower Orange River, namely Augrabies Lair trust, Groblershoop, Kakamas Triple D, Hopetown Sewer, Hopetown Sewer, Keimoes Housing, Upington Erf 323, Upington Affinity, Styerkraal, Grootdrink Bridge, and Turksvy Dam. These sites were sampled based on elucidating the combined impact of the proposed developments on the Orange River. Biomonitoring was carried out according to the description of Dickens and Graham, (2002). Impacts on the Orange River, associated with the proposed development, have been included in the Freshwater Assessment as well as the Final EIR. Proposed mitigation measures have also been included.
11		**PROTECTION OF DRAINAGE LINES, CORRIDORS AND RIPARIAN ZONES** Drainage lines, corridors and riparian zones close to these township developments are being used for illegal dumping and ablutions with rainfall that washes pollutants towards the lower Orange River. Measures to prevent and mitigate stormwater contamination should be investigated with cognisance of the expected run-off from these catchments, including the new development areas. It should, however,	Noted. Areas associated with watercourses have been zoned as open space – thereby incorporating a buffer from potential anthropogenic impact (Figure 3 below). Moreover, mitigation measures proposed by the Specialists have been included in the EMPr and Final EIR. Should the EA be granted by the competent authority, all mitigation measures must be complied with. In addition to parameters stipulated in the

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		be endeavoured to avoid any development close to watercourses/dry drainage lines.	Engineer's Services Report (Appendix 4B), a Stormwater Management Plan (SWMP) must be designed and compiled to address concerns raised by the I&AP - namely the potential flow of sewage- and/or solid waste-contaminated stormwater runoff from the development into the drainage lines and subsequently the Orange River. Therefore, it is recommended that the proposed development be supported/ authorized subject to the compilation of a SWMP which includes required engineering parameters (Appendix 4B) and the management of potentially sewage- and/or solid waste-contaminated stormwater runoff.
		We note and agree with the recommendation in the May 2020 Freshwater Report by Watsan Africa that a buffer zone of 50 m should be left undeveloped around all natural drainage lines. However, the township layout plans as shown in, for example, Figure 23 of the draft	 **Figure 3.** Buffer areas associated with non-perennial watercourses. Please note that Figure 23 (in the Draft EIR) depicted the proposed new full borne sewerage system which was recommended to service a total of 1015 households (465 existing households and 550 proposed households). This design layout was adapted from the Engineer's

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		Boegoeberg EIR does not take cognisance of this recommendation. These buffer zones have been indicated in Appendix 2D (preferred layout site plan). The draft EIR's should be updated to include the correct plans that show the buffer zones.	Services Report (Appendix 4B). The layout presented in Figure 23 is not the preferred layout (relative to zoning). It must be further noted that this application is for the proposed housing development and **not** for the authorisation of a WWTW – in light of this, should the EA be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW. As per the Freshwater Report (Appendix 6C), "*The drainage lines pass right through the current settlement, with a strip of land of about 50m wide to accommodate the drainage lines. It does not seem if formal storm water canals are required for this small catchment with a limited runoff. If anything of the kind is required for the new development, it can be small, minimalistic, with no more impact on the drainage line that is really required. From an environmental point of view, it would probably be best to leave a strip of land around the drainage line without any further disturbance".* And proposed mitigation measures include "*Leave a strip of land 50m wide around the drainage line".* This mitigation measure was included in the Draft EIR which must be complied with should the EA be granted. Specialists were consulted with regards to the design layout and whether the proposed layout would negatively impact factors relative to the Specialist's field of expertise.
		We disagree with the low-risk ratings that were awarded in the draft EIR's impact assessment for the destruction and contamination of the drainage lines. The draft EIR's do not address the design specifications of numerous road crossings that will be required when new erven are developed in close proximity to these drainage lines.	Noted. These risk ratings were based on the Specialist Reports (Appendix 6A-D). This is the opinion of each Specialist relative to their field of expertise. For example, the Freshwater Assessment was based on the risk matrix developed by the Department of Water and Sanitation (DWS). Therefore, the rating of risks was undertaken in accordance with such guidelines in combination with the Specialist's experience and knowledge within the field (please refer to Specialist CVs – Appendix 6A – D). As per the Engineer's Services Report (Appendix 4B), internal roads can be upgraded to interlocking paved streets.
		Storm water runoff from many of these new townships will first flow through an agricultural zone before it reaches the Orange River. The mitigation of storm water that is contaminated with solid waste and sewerage has not been properly addressed as the impact on down-slope producers have not been evaluated. There is no clear plan to	Noted. In addition to parameters stipulated in the Engineer's Services Report (Appendix 4B), a Stormwater Management Plan (SWMP) must be designed and compiled to address concerns raised by the I&AP - namely the potential flow of sewage- and/or solid waste-contaminated stormwater runoff from the development into the drainage lines and

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		prevent solid waste from entering the drainage lines, polluting storm water and subsequently ending up in the Orange River.	subsequently the Orange River. Therefore, it is recommended that the proposed development be supported/ authorized subject to the compilation of a SWMP which includes required engineering parameters (Appendix 4B) and the management of potentially sewage- and/or solid waste-contaminated stormwater runoff. Please note that this application is for the proposed housing development and **not** for the authorisation of a WWTW – in light of this, should the EA be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW. As per the conclusion of the EIR, it is recommended that the proposed Housing Development be supported and be authorised with the necessary conditions of approval, **subject to the compilation and effective implementation of a waste management plan to address sewage and solid waste management, the undertaking of a TIA,** and the implementation of mitigation measures proposed by the Specialists (Appendix 6A-D) and included in the EMPr. The compilation and effective management of a waste management plan would address these impacts related to the potential contamination of stormwater. It was not in the scope of this EIR to develop a waste management plan however, mitigation measures addressing these issues have been proposed and must be implemented during the construction and operational phases of this project – which will mitigate solid waste from entering the drainage lines, polluting storm water and subsequently ending up in the Orange River.
		No link is made between the identified Critical Biodiversity Areas on the development sites and the drainage lines, corridors and riparian zones. The specialist studies in support of this application were therefore produced in isolation without any integration of results. Corridors protect environmentally sensitive areas by providing avenues for wildlife movement, buffers between natural and human communities as well as green space for humans.	According to the Northern Cape CBA maps the proposed site falls within a CBA area. As per the Botanical Assessment (Appendix 6A), the site will not impact on any recognised centre of endemism. The most significant botanical aspect of this site is the presence of a 3 protected Sheppard trees (*Boscia albitrunca*), most of which were in poor condition and a number of Northern Cape Nature Conservation Act, protected species that were also observed. The 2016, Northern Cape CBA Map (Figure 6) identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole (Holness & Oosthuysen, 2016). The 2016 Northern Cape Critical Biodiversity Area

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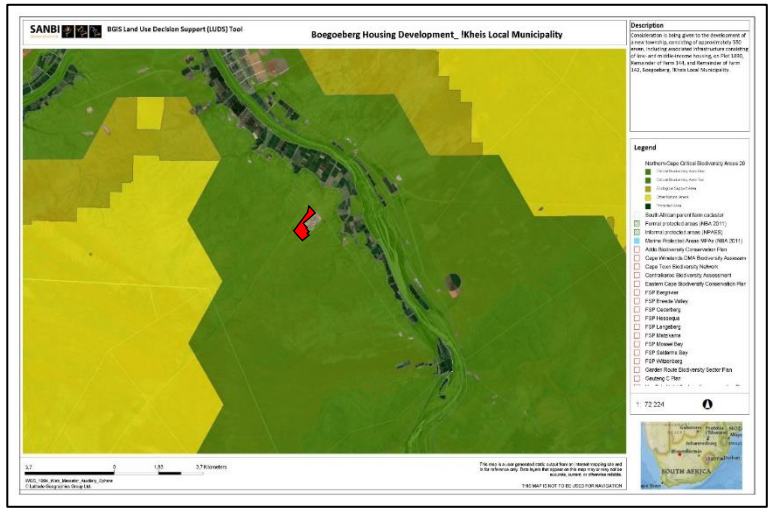
			(CBA) Map updates, revises and replaces all older systematic biodiversity plans and associated products for the province. As per Figure 4 (below), the entire, proposed site for development falls within a CBA. The connectivity (namely the potential loss of ecological migration corridors) was considered and rated as Low (The transformation will destroy connectivity within the site but will not result in a significant impact on the surrounding area, where connectivity is still excellent) which was reduced to insignificant (should the proposed mitigation measures be implemented). Open Space zoning has been provided within the design layout (please refer to Appendix 2D), buffering the non-perennial watercourses from the proposed houses. A buffer has been incorporated on watercourses (namely the non-perennial drainage lines), which have a corridor feature – thereby retaining the potential corridor function.  **Figure 4**. CBA associated with the proposed site for development (red polygon). Source: BGIS.

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		The exiting and visible high risk of contamination and destruction of the drainage lines cannot summarily be downgraded to a low risk as reported in the Freshwater Reports risk assessment and the draft EIR's. The threat to these drainage lines will increase profoundly with these proposed new developments, its associated infrastructure and human pressure.	Noted. Please note that these risks were reduced to a low risk should the proposed mitigation measures be implemented. These mitigation measures have been included in the Draft EIR, Final EIR, EMPr, and Specialist Reports and must be complied with should the EA for this project be granted. Please refer to scoring matrices (Appendices 6A-D) and Appendix 7 for the Environmental Impact Assessment (which describes potential impacts and proposed mitigation measures). It is noted that anthropogenic activities (including urban edge effects) impact the surrounding environment. Mitigation measures have been proposed to mitigate these impacts which must be complied with should the EA be authorised.
12		**EXISTING SEWERAGE MALPRACTICES** The existing problems and adverse impacts pertaining to sewerage disposal malpractices should be addressed before embarking on any new developments. Years of bad governance by this dysfunctional municipality simply will not change overnight. It is dishonest to give the !Kheis Municipality the benefit of the doubt when assigning risks to new developments that will most likely just amplify the existing problems. Past behaviour predicts future behaviour.	Noted. It must be further noted that this application is for the proposed housing development and not for the authorisation of a wastewater treatment works (WWTW) – considering this, should the EA be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW. Existing sewage services and future sewage infrastructure, required to service the proposed development, was addressed in the Engineer's Services Report (Appendix 4B). As per the conclusion of the EIR, it is recommended that the proposed Housing Development be supported and be authorised with the necessary conditions of approval, **subject to the compilation and effective implementation of a waste management plan to address sewage and solid waste management, the undertaking of a TIA,** and the implementation of mitigation measures proposed by the Specialists (Appendix 6A-D) and included in the EMPr.
		New sewerage oxidation dam systems or WWTW's have been proposed in the draft EIR's. The question is asked whether these new bigger facilities will be properly maintained and operated if the modest existing pump stations and sewerage dams are not.	Noted. Please see comment above. Please note that the proposed sewage infrastructure was recommended by the Engineer (as per Appendix 4B) to service the future development. The construction and / or operation does not form part of this application.
		In the context of existing challenges pertaining to sewerage water treatment at !Kheis Municipality, we cannot agree with the assumption	**Noted. Please note that the recommendations made in the Draft EIR were based on findings from the specialists and site visits**

<table>
<tr><th>No.</th><th>Comment Date, Comment Format, Organisation/I&AP</th><th>Comment</th><th>Response from EAP/Applicant/Specialist/Project Manager</th></tr>
<tr><td></td><td></td><td>made in the freshwater impact assessment and the draft EIR's that an increased volume of sewerage poses a low risk.

Table 1 was prepared from information contained in the October 2020 Bvi Engineering reports and show the expected cumulative sewerage flows per day.

Table 1: Expected sewerage flows
<table><tr><th>TOWNSHIP</th><th>EXPECTED NEW SEWERAGE FLOW l/day</th></tr><tr><td>WEGDRAAI
360 stands</td><td>461 500</td></tr><tr><td>TOPLINE
248 stands</td><td>272 000</td></tr><tr><td>OPWAG
730 stands</td><td>365 000</td></tr><tr><td>GROOTDRINK
370 stands</td><td>546 000</td></tr><tr><td>GROBLERSHOOP
1500 stands</td><td>889 600</td></tr><tr><td>BOEGOEBERG
550 stands</td><td>531 050</td></tr><tr><td>TOTAL</td><td>3 065 150 l/day</td></tr></table>
These calculations show that the expected cumulative volume of sewerage that will need to be treated with the development of 3 758 new erven, will amount to 3 065 m^3/day.

This cumulative volume of sewerage that will need to be discharged near the lower Orange River is significant. It can be expected that</td><td>conducted. A low risk rating was given to the proposed increase in sewage generation should mitigation measures (which includes the construction of the recommended WWTW) be implemented. As per the conclusion of the EIR, it is recommended that the proposed Housing Development be supported and be authorised with the necessary conditions of approval, <u>subject to the compilation and effective implementation of a waste management plan to address sewage and solid waste management, the undertaking of a TIA,</u> and the implementation of mitigation measures proposed by the Specialists (Appendix 6A-D) and included in the EMPr.

Noted and confirmed that Table 1 shows <u>total</u> (combination of existing and expected) sewage generation for each proposed development and the overall total.

Noted and confirmed that the total expected sewage flow will be 3 065 150 l/day (3 065.15m^3/day).</td></tr>
</table>

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		downstream users, aquatic ecosystems and ground water users down-slope of these developments may be adversely affected. These cumulative impacts have not been addressed in the draft EIR's. The re-use of treated wastewater should be investigated as part of impact management and mitigation measures.	Noted. Cumulative impacts have been rated in the Botanical (please refer to Appendix 6A) and Freshwater (please refer to Appendix 6C) reports. Mitigation measures for these cumulative impacts have also been proposed and incorporated into the Draft / Final EIR. As per the Freshwater Assessment, biomonitoring was conducted at eleven (11) sampling points along the Lower Orange River, namely Augrabies Lair trust, Groblershoop, Kakamas Triple D, Hopetown Sewer, Hopetown Sewer, Keimoes Housing, Upington Erf 323, Upington Affinity, Styerkraal, Grootdrink Bridge, and Turksvy Dam. These sites were sampled to elucidate the combined impact of the proposed developments on the Orange River, and was carried out according to Dickens and Graham, (2002). The PES of the Orange River (for both riparian and instream zones) were categorized as Class C (Moderately modified - a loss and change of the natural habitat and biota, but the ecosystem function is predominantly unchanged), and is an Ecologically Important system (as classified by the Freshwater Specialist). Furthermore, the Orange River is Ecologically Sensitive. It must be noted that this application is for the proposed housing development and not for the authorisation of a wastewater treatment works (WWTW) – considering this, should the EA be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW. Existing sewage services and future sewage infrastructure, required to service the proposed development, was addressed in the Engineer's Services Report (Appendix 4B). As per the conclusion of the EIR, it is recommended that the proposed Housing Development be supported and be authorised with the necessary conditions of approval, **subject to the compilation and effective implementation of a waste management plan to address sewage and solid waste management, the undertaking of a TIA,** and the implementation of mitigation measures proposed by the Specialists (Appendix 6A-D) and included in the EMPr. The re-use of treated wastewater would be addressed in the application for the proposed construction of the WWTW.
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		GROUND WATER CONTAMINATION Ground water quality down-slope from the proposed developments and the existing settlements should be investigated. It is believed that, in the absence of adequate wastewater services at many of these settlements, much sub-surface pollution may reach the shallow aquifer and neighbouring boreholes. These down-slope boreholes are being used for irrigation, livestock watering and potable purposes and may pose a serious risk to public health. Aspects pertaining to ground water contamination and its impact on downslope landowners and the Orange River were not addressed in the draft EIR's. The geotechnical report by Cederland Geotechnical Consult only briefly makes mention of a ground water aquifer that may be less than 15 metres deep, which means that a shallow ground water aquifer does exist. No boreholes were identified in the development zones and no ground water samples were analysed. The total disregard of this potential serious impact is a critical omission in the draft EIR's. It is disconcerting that no surface or ground water samples were analysed as part of the Freshwater Impact Report. Historical data was also ignored. The outcome of freshwater risk assessments for each development area cannot be trusted without any information on fresh water.	Noted. The current status of water supply, sewage and solid waste management, electricity, stormwater management, and road infrastructure and future infrastructure, required to service the proposed development, was determined (Appendix 4B). According to the Geo-technical Assessment (Appendix 6D), no perched groundwater was encountered on site during the geotechnical investigation (and is not anticipated to be problematic on site). Groundwater is expected to occur at depths less than 15m within compact, argillaceous strata. Successful drilling for water within the proposed site for development is expected to be between 40 – 60% whereas the drilling for a borehole yielding at least 2l/s ranges between 10 – 20%. Noted. As per the Freshwater Impact Assessment, the watercourses present within the development footprint were dry (i.e. non-perennial drainage lines) and therefore, surface water sampling could not be undertaken. As this application was for the proposed development of housing, the scope/ terms of reference of the Freshwater Impact Assessment was based on the nature of the proposed development. A Freshwater Impact Assessment was undertaken in terms of the National Water Act (NWA), Act No. 36 of 1998. The Fresh Water Report must contain adequate information to allow for informed decision-making. The decision to approve the proposed urban development rests with DWS officials, in terms of S21 of the NWA. The Fresh Water Report must contain specified information according to a set profile, which has been developed over a number of years over many such reports and in accordance with GN509. A Risk Matrix is to be completed, as published on the DWA webpage.
14		**NEW INFRASTRUCTURE REQUIREMENTS** The existing wastewater services at the development areas are clearly inadequate and are inefficiently maintained. New infrastructure should be designed, built and maintained to prevent any sewerage water from polluting the groundwater or the lower Orange River.	The Engineer's Services Report (Appendix 4B) investigated the status of existing services and proposing recommendations relative to the construction and / or upgrade of existing infrastructure to service the proposed housing development. It must be noted that this application is for the proposed housing development and not for the authorisation of a wastewater treatment works (WWTW) – considering this, should the EA

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			be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW. Existing sewage services and future sewage infrastructure, required to service the proposed development, was addressed in the Engineer's Services Report (Appendix 4B). As per the conclusion of the EIR, it is recommended that the proposed Housing Development be supported and be authorised with the necessary conditions of approval, **subject to the compilation and effective implementation of a waste management plan to address sewage and solid waste management, the undertaking of a TIA,** and the implementation of mitigation measures proposed by the Specialists (Appendix 6A-D) and included in the EMPr. The re-use of treated wastewater would be addressed in the application for the proposed construction of the WWTW.
		The design of new sewerage water infrastructure as performed by Bvi Civil Engineers neglected to specify whether oxidation dam systems should be equipped with an impermeable lining.	Noted. This should be incorporated into the application for the proposed construction of the WWTW.
		The Gariep Watch water quality monitoring program clearly show that polluted shallow aquifers close to the river impact adversely on the Orange Rivers' water quality. A river profiling study close to a township such as Brandboom will in all likelihood show increases in *E. coli* as the river progresses past the township. These increases will be in the absence of any visible surface flow or point sources of sewerage pollution. Cederland Geotechnical Consult identified shallow aquifers at these !Kheis Municipality development sites and these aquifers must be protected according to law. No mitigation was proposed in the draft EIR's or associated specialist studies because this risk was not evaluated. The Gariep Watch comments on the draft Scoping Report were therefore ignored.	Please note that the potential contamination of groundwater would most likely be attributed to sewage spillages and discharge of raw sewage due to the ability of WWTW to adequately service the proposed increase in sewage generation. Mitigation measures and recommendations proposed by the Specialists and EAP have been proposed. For example - as per the conclusion of the EIR, it is recommended that the proposed Housing Development be supported and be authorised with the necessary conditions of approval, **subject to the compilation and effective implementation of a waste management plan to address sewage and solid waste management** and the implementation of mitigation measures proposed by the Specialists (Appendix 6A-D) and included in the EMPr. The construction and operation of a WWTW would mitigate impacts associated with the pathogenic contamination of groundwater.
		Every township in the development area is littered with glass, plastic and chemicals that may cause water pollution. Licenced municipal waste disposal facilities should be developed to cater for any new development before it is undertaken. These facilities should be properly maintained.	Noted. Illegal dumping was observed during the site visit and by the Specialists. Please refer to the Engineer's Service Report where solid waste management was addressed.

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15		**BIOMONITORING IN SUPPORT OF A WATER USE LICENCE APPLICATION** Wide-ranging assumptions were made in the Freshwater Reports to substantiate desktop ecological scores without site-specific field work. SASS5 is just one of the recognized rapid bioassessment methods, making use of benthic macroinvertebrates to assess ecosystem integrity in rivers. It is of limited use without information on instream water quality, flow, habitat, etc. Caution is therefore needed in applying rudimentary SASS surveys as the sole protocol when determining a rivers Present Ecological State (PES), Ecological Importance (EI), Ecological Sensitivity (ES) and for the completion of an aquatic ecosystem risk assessment. No fish, sediment, hydrology, geomorphology, water quality, diatom, habitat or riparian vegetation assessments were performed. The Freshwater Report's outcome is therefore based on opinion and not on scientifically credible research. Gariep Watch is maintaining a detailed biomonitoring program on the lower Orange River and one of our sites are situated at EWR02 (Boegoeberg). A Boegoeberg SASS5 score of **146** was calculated by accredited practitioners of Clean Stream Biological Services for Gariep Watch during September 2019. The DWS's River Health database as well as a 2010 macroinvertebrate survey for the DWS supports this score at EWR02. The SASS5 scores at twelve Orange River localities including the Boegoeberg area as sampled by Watsan Africa ranged between 18 and 50. This major discrepancy between our finding of 146 and those reported by Watsan Africa in their Freshwater Reports is disturbing, especially because these low scores are blamed solely on toxic agricultural runoff. There is no basis for this assumption and all findings in the Freshwater Reports should then be viewed with circumspection. Proof of the accreditation of Watsan Africa's SASS practitioners are requested.	**Respondent: Freshwater Specialist and EAP** The Department of Water and Sanitation maintains an elaborate biomonitoring schedule in the Lower Orange River. Sampling rounds are conducted every 3 months on selected sampling stations. These biomonitoring results are not available to specialist scientists for WULA's. The DWS, according to their rich database, is in the best position to decide if the limited biomonitoring results as offered can contribute towards their decision-making. Moreover, a Fresh Water Report for a WULA, apart from some of the key water quality attributes that can be measured with field instruments, because of typical time and budget constraints, cannot conduct microbiological and chemical water analysis. Again, the DWS maintains an elaborate sampling and national water quality analytical programme that has resulted in a long and very rich database. The DWS will draw on this knowledge for their decision-making. Some of the details: A SASS5 score of 146 is certainly not representative of a mature river, with limited habitat types and many impacts. To uphold this score as the base-line for the Lower Orange River is simply unrealistic and scientifically undefendable. The specialist is a registered scientist, in line with South African legislation who has participated in the National River Health Programme and have been conducting biomonitoring since its inception.
16		**ECOLOGICAL WATER REQUIREMENTS**	**Respondent: Freshwater Specialist**

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		A comprehensive Reserve determination for the lower Orange River WMA was conducted for the Orange Senqu River Commission (ORASECOM) and the DWS in 2016. This DWS report deals with the ecological water requirements for surface and ground water in the lower Orange River and includes a site EWR02, which is located at Boegoeberg in Management Resource Unit C (Prieska to Boegoeberg). No mention or reference is made to this important DWS Report No. RDM/WMA06/00/CON/COMD/0216 of August 2016 in the Freshwater Reports. The 2016 Ecoclassification at site EWR02 showed that the Ecological Importance and Sensitivity (EIS) is **High**, the Present Ecological State (PES) is moderately modified (Category C) and the Recommended Ecological Category (REC) falls in Category B/C. Another relevant report has also not been considered by the compilers of the Freshwater Reports and draft EIR's. Rivers for Africa as the professional service provider for DWS compiled a report on the ecological requirements for surface and ground waters in the lower Orange River WMA (Report no. RDM/WMA06/00/CON/COMP/0217 of July 2017). This report provides valuable input towards the implementation of an ecological reserve downstream from the development area. The aquatic impact assessments in the Freshwater Reports and draft EIR's have not incorporated relevant, available and credible scientific research. These reports can therefore not be relied on to plan for the mitigation of aquatic biodiversity-related risks that may be associated with the proposed developments. The cumulative impact of these six major developments on ecological water requirements in the lower Orange River were not considered in the draft EIR's. A water use licence in terms of Section 21 of the NWA should not be granted if this impact is not properly understood.	In the Freshwater Report, the Present Ecological State of the Orange River was assessed to be a Class C. This supports the findings of the 2016 report that assigned a "C" as well. It remains for the I&AP to scientifically prove that the "cumulative" impacts of the 6 proposed developments would be of such a scale and nature that a General Authorization should not be granted, provided the sewage and waste issues are resolved.
17		**WATER QUALITY** Freshwater Reports without any reference to surface or ground water quality information should be viewed with caution. It is stated in the	**Respondent: Freshwater Specialist** According to the findings of the Freshwater Report, a General Authorization would be in order, provided that the wastewater and urban

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		Freshwater Reports by Watsan Africa that pesticides in agricultural return flow is responsible for a heavy impact on biomonitoring results, resulting in a reduced SASS score. Detailed pesticide analyses of agricultural return flows and DEEEP toxicity studies were performed for Gariep Watch by Clean Stream and BiotoxLab. These analyses did not show any pesticides or environmental toxicity in the agricultural return flows or in the lower Orange River. The impact assessments that pertain to water quality in the Freshwater Reports and subsequent draft EIR's are based on speculation and not on credible scientific research. In the absence of water quality data, any conclusions made in these reports cannot be used to plan for the mitigation of any surface or ground water quality risks that may be associated with the proposed developments. Gariep Watch do appreciate and support Watsan Africa's viewpoint that further developments will exacerbate the current sewerage treatment and disposal malpractices. This forewarning by the project team's own specialists was shrewdly not carried over to the draft EIR's or risk assessment matrix. These Freshwater Reports were also prepared in support of a water use licence application (WULA) as required in terms of Section 21 of the National Water Act. Outdated and speculative information were provided therein, and a new water use licence could not in all conscience be approved by the DWS. The context of current sewerage treatment and disposal malpractices should be taken into consideration when reviewing new licence applications.	waste issues be resolved. This is entirely in agreement with the I&AP's stance on these "malpractices".
18		**WATER ABSTRACTION** The abstraction of additional water resources from the lower Orange River was not addressed in the specialist studies or draft EIR's. The cumulative impact of all !Kheis township development proposals should be evaluated. This is a serious omission and considered to be another fatal flaw in the environmental application process. Available research should be used to prepare a credible water use licence application that takes cognisance of the Ecological Reserve. Relevant reports are DWS Report No.	**Respondent: Freshwater Specialist** The DWS is in the best position to discount the additional water abstraction against the Ecological Reserve. This is a formidable study on its own beyond the scope of a WULA Fresh Water Report. Moreover, this additional water abstraction is negligible if compared to that of agriculture and irrigation. Please note that a Water Use License Application is in process. The Department of Water and Sanitation is the competent authority with regards to granting the Water Use license.

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<tr><td></td><td></td><td>RDM/WMA06/00/CON/COMD/0216 of August 2016 and Report no. RDM/WMA06/00/CON/COMP/0217 of July 2017.

Table 2 was prepared from information enclosed in the Bvi Engineering reports and show the existing annual average daily water demands compared with the expected growth in annual average daily water demand.

Table 2: Existing and new annual average daily water demands.

<table>
<tr><th>TOWNSHIP</th><th>CURRENT AVERAGE DAILY DEMAND m^3/day</th><th>EXPECTED NEW DAILY DEMAND m^3/day</th><th>ADDITIONAL WATER REQUIREMENT m^3/day</th></tr>
<tr><td>WEGDRAAI
360 stands</td><td>535</td><td>319</td><td>216</td></tr>
<tr><td>TOPLINE
248 stands</td><td>428</td><td>279</td><td>149</td></tr>
<tr><td>OPWAG
730 stands</td><td>488</td><td>106</td><td>382</td></tr>
<tr><td>GROOTDRINK
370 stands</td><td>681</td><td>459</td><td>222</td></tr>
<tr><td>GROBLERSHOOP
1500 stands</td><td>3496</td><td>1172</td><td>2324</td></tr>
<tr><td>BOEGOEBERG
550 stands</td><td>710</td><td>380</td><td>330</td></tr>
<tr><td>TOTAL</td><td>6 338 m^3/day</td><td>2 715 m^3/day</td><td>3 673 m^3/day</td></tr>
</table>

Table 2 shows that the total cumulative new water demand will increase to 9 053 m3/day, which include the developments additional cumulative water demand of 3 623 m3/day.

This additional water requirement from the lower Orange River for the development of 3 758 new stands is significant. It can be expected that downstream users and especially the aquatic ecosystems may be affected during low flow conditions. These cumulative impacts have not been addressed in the draft EIR's.</td><td>Noted, and conformed (please note that the expected new daily demand for Groblershoop is 1127m^3.day and not 1172m^3/day). $Total_{expected\ new\ daily\ demand}$ = 2670m^3/day and $Total_{additional\ water\ requirement}$ = 3668m^3/day.

Please note that a Water Use License Application is in process. The Department of Water and Sanitation is the competent authority with regards to granting the Water Use license.</td></tr>
</table>

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19		**PROCEDURAL SHORTCOMINGS** Gariep Watch commented on the draft Scoping Report on 22 September 2020. These comments should have been addressed by the various specialists for its inclusion into the draft EIR's, which is dated January 2021. The Freshwater Reports are dated May 2020, which means that the Sept 2020 Gariep Watch comments have been ignored and not included in these reports or the draft EIR's. This is a serious shortcoming in the interactive public participation process that should be followed for such an important and expansive development proposal. The draft EIR's by EnviroAfrica conclude with an assertion that the proposed development does not pose **any** significant impact, should the proposed mitigation measures be implemented. We strongly disagree with this misleading statement and view it as a fatal flaw in the process. The real risks to the lower Orange River as highlighted by Gariep Watch has been ignored and were therefore not included in the environmental decision-making process that leads to mitigation. We believe that there is a high likelihood that existing adverse impacts associated with untreated sewerage discharges from the !Kheis Municipality will merely continue and new developments will compound the severity of these impacts. Prevailing malpractices at the !Kheis Municipality should be resolved before embarking on any new extensions. Please feel free to contact Gariep Watch if there are any questions or queries.	Please note that issues raised by the Gariep Watch were addressed in the Draft EIR in the following way. **It must be further noted that this application is for the proposed housing development and <u>not</u> for the authorisation of a WWTW – in light of this, should the EA be granted for this application, the recommended WWTW would require a new application where environmental impacts will have to be re-assessed relative to impacts associated with WWTW.** Please see following for summary of responses to previous comments raised: 1. Findings of the Specialists, EAP and the Municipality were considered with regards to design alternative layouts (Appendix 2A-D). Design Alternative 4 (Appendix 2D) is the preferred layout and incorporates the aforementioned drainage lines – zoning these areas as Open Space II and Undetermined Zone and therefore, mitigating the impacts associated with the proposed housing development in close proximity to the identified watercourses. Moreover, proposed mitigation measures relative to the construction and operational phases have been included in the Final EIR, Specialist Reports and the EMPr, which must be complied with. 2. Illegal dumping was noted during the site visit conducted by the EAP and Specialists. Illegal dumping was identified as an impact to watercourses and surrounding environment (e.g. Appendix 6C) and mitigation measures were proposed. Illegal dumping has been addressed in the Specialist Reports and Engineer's Services Report where a solid waste management plan was recommended to be compiled and implemented for the proposed development as a condition should the EA be granted. Mitigation measures and recommendations stipulated by the Specialists and Engineer (and as included in the EMPr – Appendix H) must be complied with. 3. Issues relating to water quality and sewerage infrastructure have been addressed in the draft EIR, Specialist Reports (Appendix 6A-D), and Engineer's Services Report (Appendix 4B). As per the Engineer's Services Report, the Engineer has detailed existing services (including water supply, sewage

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			management, solid waste management, electricity, roads, and stormwater management) capacity and recommended the construction / upgrade of sewage management infrastructure to service the proposed development. As per the Draft EIR, the proposed development is supported subject to the implementation of the recommended mitigation measures proposed by specialists, and stipulated in the EMPr, and the compilation and effective implementation of a waste management plan. This waste management plan would include the construction of a Wastewater Treatment Works with the capacity to service the current and proposed housing development. **4.** Watercourses (non-perennial watercourses) present within the proposed development footprint are mostly dry throughout the year. The Freshwater Impact Assessment (Appendix 6C) includes biomonitoring of the Orange River at different sampling points. As per the Freshwater Assessment, biomonitoring was conducted at eleven (11) sampling points along the Lower Orange River, namely Augrabies Lair trust, Groblershoop, Kakamas Triple D, Hopetown Sewer, Hopetown Sewer, Keimoes Housing, Upington Erf 323, Upington Affinity, Styerkraal, Grootdrink Bridge, and Turksvy Dam. These sites were sampled based on elucidating the combined impact of the proposed developments on the Orange River. Biomonitoring was carried out according to the description of Dickens and Graham, (2002). Impacts on the Orange River, associated with the proposed development, have been included in the Freshwater Assessment as well as the Final EIR. Proposed mitigation measures have also been included.
20	**Additional** In addition to parameters stipulated in the Engineer's Services Report (Appendix 4B), a Stormwater Management Plan (SWMP) must be designed and compiled to address concerns raised by the I&AP - namely the potential flow of sewage- and/or solid waste-contaminated stormwater runoff from the development into the drainage lines and subsequently the Orange River. Therefore, it is recommended that the proposed development be supported/ authorized subject to the compilation of a SWMP which includes required engineering parameters (Appendix 4B) and the management of potentially sewage- and/or solid waste-contaminated stormwater runoff. As per the specialist assessments, site visits, and comments received from registered I&APs, the management of sewage and solid waste remains a key issue which must be addressed with the		

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	implementation of a proper waste management plan[1]. Therefore, it is recommended that the proposed development be supported / authorised with the necessary conditions of approval, subject to the compilation of a stormwater management plan, waste management plan (addressing sewage and solid waste management), and the undertaking of a traffic impact assessment, along with the implementation of recommendations / mitigation measures proposed by Specialists (Appendices 6A-D) and included in the EMPr (Appendix 9).		

[1] In the context of this Comments and Responses Table, "***waste management plan"*** refers to a plan addressing the wastewater treatment works and solid waste removal infrastructure / management required to service the proposed development. Please refer to Appendix 4B (Engineer's Services Report) for more information on required infrastructure.