

Dear Charles

**Re: Addendum to Water Resources and Water Demand Study (WRWD):
WRWD Summary Findings and Response to Stakeholder Comments and
Requests for Clarity**

The purpose of this addendum is to provide clarity on the findings of the Water Resources and Water Demand study conducted as part of the Environmental Impact Assessment (EIA) process for the proposed Haib Copper Project. The Haib Copper Project at the time of writing this document is inclusive of two applications for Environmental Clearance Certificate (ECC) inclusive of:

1. THE PROPOSED HAIB MINE BY HAIB MINERALS NEAR NOORDOEWER, //KHARAS REGION, NAMIBIA
2. THE PROPOSED WATER ABSTRACTION AND SUPPLY INFRASTRUCTURE BY NAMIBIA WATER CORPORATION LTD (NAMWATER) TO SUPPORT THE HAIB MINE NEAR NOORDOEWER, //KHARAS REGION, NAMIBIA

The contents of the addendum is specifically guided by key queries raised by stakeholders during the EIA and Environmental Management Plan (EMP) feedback sessions held between April and August 2026 and following electronic correspondence.

The addendum is structured in two sections, the first representing the summary of the Water Resources and Water Demand Study (WRWD) and the second being a list of comments received from stakeholders and responses from the specialist and assessment team.

1.0 EIA CHAPTER: SURFACE WATER HYDROLOGY (ORANGE RIVER)

The Orange River is a shared watercourse, between Lesotho, South Africa, Botswana and Namibia. To align the member states of the shared watercourse, the Orange-Senqu River Commission (ORASECOM) was established in the year 2000. ORASECOM aims to develop and manage, along with other member countries, a comprehensive basin perspective, determine water use, plan for future use and intervention, as well as to determine flow monitoring requirements, and to conduct flood management.

The Orange River Project (ORP) includes the two largest storage dams in South Africa (SA), that is the Gariep and Vanderkloof Dams (Figure 1-1). These dams are used to supply water to users along the Orange River between the Gariep Dam to the Orange River mouth (inclusive of users in SA and Namibia) by regulating flows in the Orange River.

The total water use from this water supply system has increased over the years and is currently at the 2024 development level, already slightly exceeding the historic firm yield of about 3 300 Mm³/a for the ORP system. Further increases in the total water demand imposed on this system will reduce the assurance of water supply to the existing users.

Developments upstream of the Gariep Dam will further significantly impact the available yield from the ORP. These developments include the Polihali Dam currently under construction, dams in the Lesotho Lowlands, a dam on the Makhaleng River in Lesotho, and major volumes transferred to Botswana and South Africa. Polihali Dam will be used to transfer an additional 391 Mm³/a in support of the Integrated Vaal River System. The proposed dam on the Makhaleng River in Lesotho will supply a total planned water requirement of 308 Mm³/a of which 156 Mm³/a will be for Botswana, about 64 Mm³/a for SA when the Greater Bloemfontein is included, and the remainder will be utilised by Lesotho.

A transfer scheme taking water from Gariep Dam to the Greater Bloemfontein area is currently in its feasibility stage and is expected to be in place by 2031/32. The maximum transfer rate for this transfer scheme is currently set at 101 Mm³/a.

The Department of Water and Sanitation in South Africa (DWS SA), carried out a detailed study in 2015, referred to as the “Development of Reconciliation Strategies for Large Bulk Water Supply System: Orange River” (DWS, 2015), in which several intervention options were identified (not discussed here) to rebalance the Orange River due to the increased upstream developments and growth in the demand imposed on the ORP. The Noordoewer/Vioolsdrift Dam was one of the larger infrastructure options identified.

Deficits in the water supply within the ORP are expected to start taking place as soon as Polihali Dam starts to inundate water for transfers to the Vaal River System.

The water supply from the ORP to its users, and the related ORP water balance, are updated every year as part of the Annual Operating Analysis carried out by DWS SA. The most recent operating analysis was completed in June 2024.

A Water Resource and Water Demand Impact Study (WRWD) was undertaken (Knight Piésold, 2025a), which provided results towards evaluating the impacts of water abstraction from the Orange River.

Several recent analyses were carried out on this system, and the impact of the proposed water abstraction during operations (20 Mm³/a by water provider) was assessed based on the results of these analyses. The most recent analyses were carried out as part of the ORP Annual Operating Analysis by DWS SA, with the report completed in September 2024 (DWS, 2024). Comprehensive system analyses were also carried out as part of the ORASECOM Study “Preparation of Climate Resilient Water Resources Investment Strategy & Plan and Lesotho - Botswana Water Transfer Multipurpose Transboundary Project,” which was completed by the end of November 2024. Both these studies included the proposed future developments along the ORP, or at least most of them. The ORASECOM study also includes some water requirements for the future Haib Mine Development.

For the first phase of the analysis, historic flow sequences were considered using the Water Resource Planning Model (WRPM) that simulates water resource systems to assess the risk of future water restrictions. It analysed the balance between water supply and projected demand, incorporating factors like infrastructure changes, future water requirements, and return flows to determine the resource capability of various subsystems. The model is crucial for implementation scheduling, planning, and analysing complex water systems like the Orange River System.

The WRPM system setup used for this analysis includes the entire Orange, Senqu and Vaal River catchments. This system thus includes the total Lesotho, Molopo and Nossob catchments in Botswana, the Lower Orange, the Fish River and Nossob River in Namibia and a large portion of the RSA, which includes the Orange, Molopo, Vaal River and all related tributaries (Figure 1-1). This WRPM data set

was originally prepared as part of the ORASECOM Phase III study and again updated as part of the 2024 and 2025 ORASECOM Ecological Water Requirement (EWR) study. This covers historic flows for the period 1920 to 2004.

The WRWD study shows that the Orange River Project (ORP) at the 2024 development level is already slightly over-utilised. There is thus no more yield available from the ORP to supply increasing water requirements continuously throughout the year. This over-utilisation will increase at the 2035 development level with numerous developments in the catchment, primarily the Polihali Dam.

At the 2024 development level, 7 years required restrictions over the 85-year period of analysis (1920 – 2004; thus 8.2% of the time) to protect the resource from total failure (dams running empty). This is on average more than the 4 to 5 times over 100 years (5% of the time) that would typically be expected, indicating the over-utilisation of the Orange River.

This baseline will need to be critically considered when assessing the potential impacts of abstraction from the Orange River.

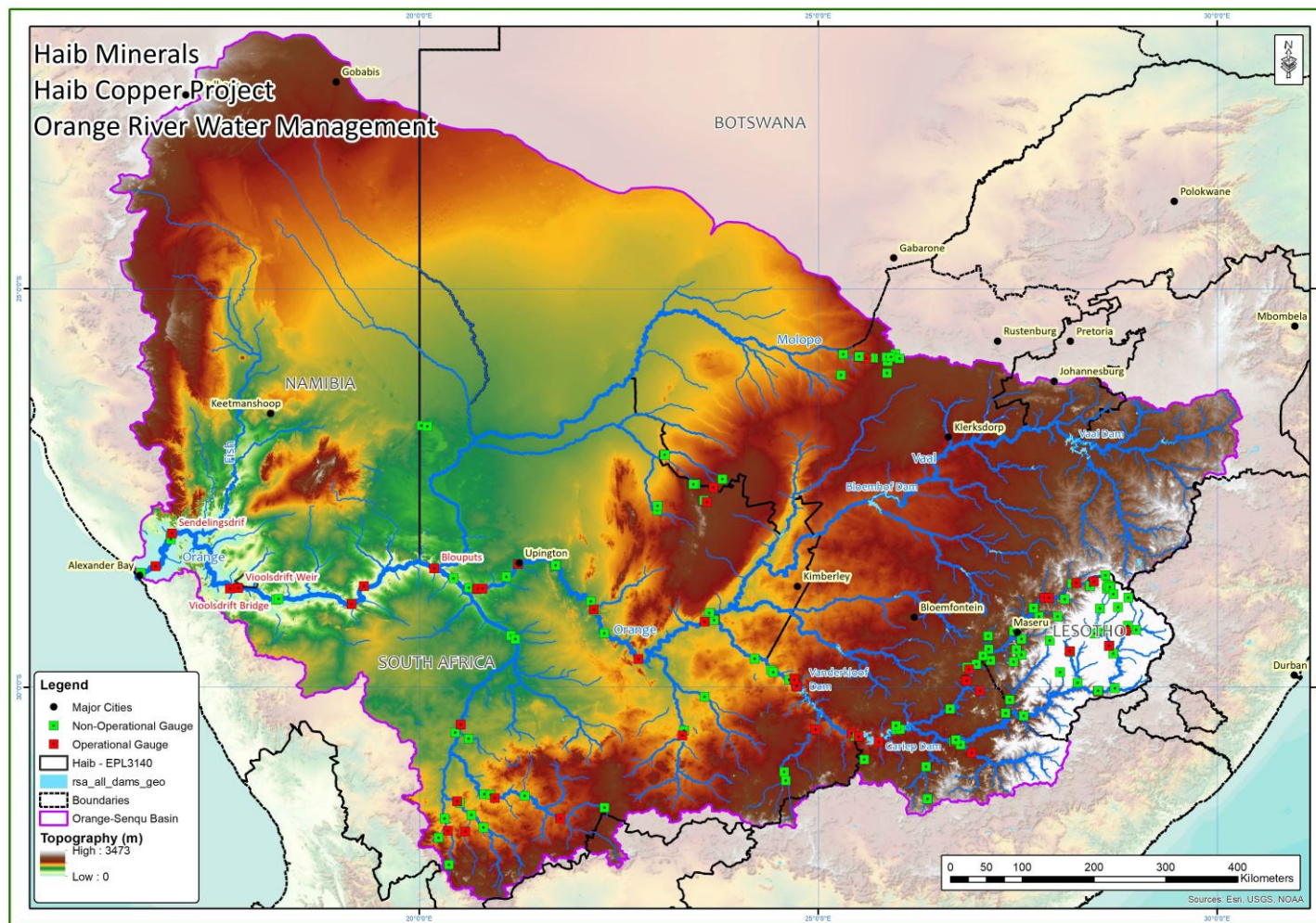


Figure 1-1: The Orange, Senqu and Vaal River catchment and associated water management features.

Summary of Water Resource and Water Demand Impact Study

- The Orange River Project (ORP) at the 2024 development level is already slightly over-utilised. There is thus no more yield available from the ORP to supply increasing water requirements continuously throughout the year. This over-utilisation will increase at the 2035 development level with numerous developments in the catchment, primarily the Polihali Dam.
- At the 2024 development level, 7 years required restrictions over the 85-year period of analysis (1920 – 2004; thus 8.2% of the time) to protect the resource from total failure (dams running empty). This is more than the 4 to 5 times over 100 years (5% of the time) that would typically be expected, indicating the over-utilisation of the Orange River.
- If the water required for the Haib Mine is supplied from the ORP (i.e. relying on releases from the Gariep and Vanderkloof Dams), the number of years with restrictions increased from 7 (without Haib Mine) to 9 (out of the 85 years assessed). When water is supplied from the ORP at the 2024 development level, it will thus impact the assurance of supply to other users.
- At the 2035 development level, restrictions in the ORP system increase significantly from only 7 years out of the 85 years analysed to 31 years out of the 85 years – in both instances without any demand by Haib Mine. The average restriction over the years with restrictions then increases from 12% to 18.1%. These results show that even without Haib Mine, the combined impact of the increase in demand and the effect of the Polihali Dam and other developments on the ORP resulted in restrictions being imposed on the system much more frequently and to such an extent that the assurance of supply to users will be significantly compromised.
- The restrictions described are expected to occur in low flow periods when the combined storage in the ORP system is low.

Haib Mine Operational Demand of 20Mm³/a

- The WRWD study shows that to completely avoid impacts on existing abstraction, water may be pumped from the Orange River during high-flow periods (or periods of surplus flow) into an off-channel storage dam, which then can supply water for mining operations throughout the year, without affecting downstream users. This applies to all the development levels / scenarios analysed. The analyses showed that for an annual mining demand of 20 Mm³/a, an optimum between abstraction capacity and dam volume is provided by a 2 m³/s diversion pump capacity and an off-channel storage volume of 25 Mm³ storage.
- To effectively avoid impacts of abstraction on downstream users (inclusive of the EWR) two key questions arose from these results:
 - What is the definition of surplus flow. (i.e. at what point should abstraction stop).
 - Will the periods of surplus flow be sufficient to fully supply the demand (i.e. will there be enough time under the definition of surplus flow to abstract what is needed).
- Towards answering these questions, the WRWD study looked at understanding the historical and possible future (Stochastics) flow patterns in the lower Orange system. The Blouputs streamflow gauge (D8H014) represents a key gauging station used for monitoring and operating purposes of the ORP system. This gauge is located on the main Orange River downstream of the Augrabies Falls just before the Namibian border. This gauge is the first gauge upstream of the Haib Mine abstraction site and forms the basis of the analysis. Flows at Blouputs are used to determine the required minimum flows downstream to the estuary, comprising all the user requirements between Blouputs and the estuary, the river evaporation and transpiration losses over this reach, as well as the EWR at the estuary.
- Observed flow data were sourced from the Blouputs and Sendelingsdrift streamflow gauges, for which data are available for the period 2014 to date (operational since 2014) (Figure 1-2).

These streamflow gauges are upstream and downstream of the abstraction point and are currently operational.

- Observed results at these stations show periods of high flows and low flows associated with seasonal variation, water use and abstraction and water losses and after 2020 releases from Vanderkloof Dam (Figure 1-2). Figure 1-2 additionally illustrates the EWR (red) flow requirements.
- Various low flows are observed across the years, but with specific extremes tending towards the EWR at Blouputs around December 2016 and February 2019 when the flows at Blouputs were very close to the EWR, indicating insufficient water in the lower Orange River for abstraction. This was confirmed by the observed flows at Sendelingsdrift showing a deficit in the EWR supply during those two months. This represents periods where no excess water is available for abstraction, posing a critical threat to downstream water users. Note Sendelingsdrift flow data are an incomplete record but show post 2020 flows falling short of the EWR in 2024 and 2025, illustrating unplanned water loss in the system (typically driven by heatwaves in the lower Orange River).
- Although target flows are established at Vanderkloof Dam this was not sufficient to ensure management of deficits downstream in the Lower Orange River (Figure 1-2). As a result, the South African Department of Water Affairs (DWS), through feedback received from water users during these extreme low flow periods, reacted by introducing required minimum flows at Blouputs to ensure sufficient provision is made for the EWR, losses and abstractions downstream between Blouputs and the estuary. When flows at Blouputs drop below these required minimum values, releases from Vanderkloof and Gariep Dams upstream are triggered to better manage and mitigate supply deficits. These minimum flows effectively serve as an updating of the operating rules, and have been in place since 2020 and are also indicated in Figure 1-2.
- Each year as part of the annual operating analysis of the ORP, these minimum monthly flows are set for flows measured at Blouputs. These are the minimum flows required to satisfy all the water requirements downstream of Blouputs to the Orange River Mouth. All water requirements are defined as the water users, irrigation, domestic/industrial, mining, the EWR and water losses (evaporation, seepage, groundwater recharge, etc.). During the operation of this system, DWS (SA) monitors the flow at this site continuously and if the flow drops below the minimum flow (2025 low flows specified in Table 1-1), more water will be released from Vanderkloof Dam to increase the flow at Blouputs. The definition and integration of the minimum monthly flows into the operating procedures of the ORP is to manage the deficits experienced in the lower Orange River as typically experienced in 2016 and 2019.
- For the purposes of possible abstraction by NamWater for the proposed Haib Mine, surplus flow is thus defined in the WRWD as any flow rate that exceeds the defined minimum flow values at Blouputs. In other words, in order to avoid any impact on downstream users, water abstraction to Haib Mine will only take place when the flow at Blouputs is higher than the required minimum flow. The minimum monthly flows that, if exceeded, trigger a “surplus flow” state in the lower Orange River, are presented in Table 1-1. Note the minimum flows have been increased since introduced in 2020 as development (abstraction) downstream has increased.

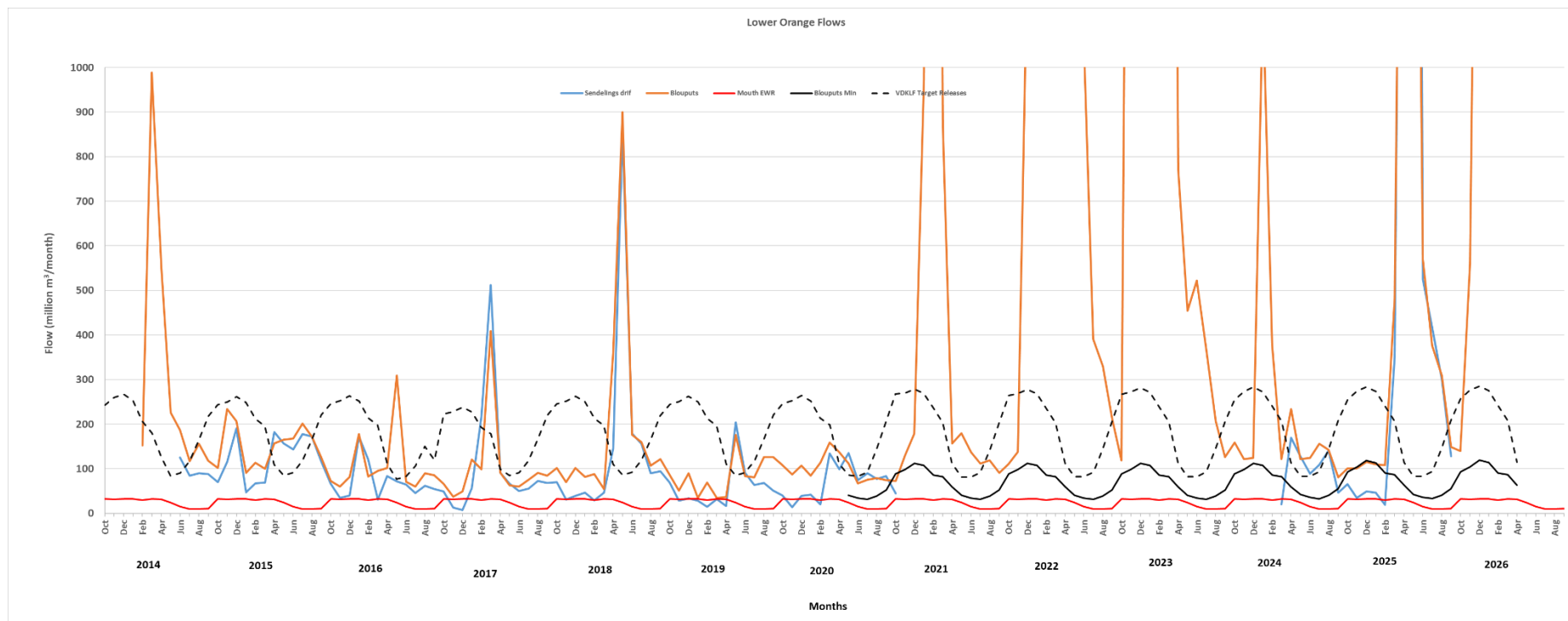


Figure 1-2: Observed average monthly flows by year at Blouputs and Sendelingsdrift gauging stations against various requirements in the lower Orange River System

- Analysis done in the Pre-Feasibility Studies shows that in order to achieve the Mine's demand of 20 million m³/a, some 20.8 Mm³/a needs to be abstracted to allow for evaporation losses from the off-channel storage dam. To obtain this volume of abstraction, a minimum of 121.5 days are required at a peak abstraction rate of 2 m³/s. This equates to approximately 4 months for which the Orange River must be in "surplus state" to meet the Mine's demand. This period required may be shortened if a higher pumping rate is implemented or lengthened if a lower abstraction rate is used.

Table 1-1: Minimum monthly flow required at Blouputs (2025) to avoid an impact on the assurance of supply downstream (DWS updated annually)

Month	Minimum Monthly Flow Required at Blouputs	
	Instantaneous (m ³ /s)	Monthly (Mm ³ /m)
May	15.83	42.40
June	13.93	36.11
July	12.23	32.76
August	15.12	40.50
September	21.13	54.77
October	34.73	93.02
November	40.09	103.91
December	44.31	118.68
January	42.20	113.03
February	36.93	90.14
March	32.29	86.49
April	24.24	62.83
Annual	27.72	874.63 (Mm³/a)

- Note the minimum monthly flow varies across the year with the predominant driver of the trend downstream of Blouputs being environmental losses and the EWR, which together exceed the demand of the downstream water users. The observed flow averaged across the years monthly against the minimum monthly flow shows surplus flows in the Orange River at Blouputs for the majority of the year (Figure 1-3).
- Note observed flow data are only available at Blouputs for the last 12 years (since 2014). However, simulations of the average flow are based on observed and calibrated flow data from other areas in the Orange for the last 85 years (green line). The results show that, on average, higher risk months are October, November and December (based on the driest 6 years 2014-2020) where the risk is triggering a no-abstraction scenario for the Haib Demand. It is this risk that has triggered the need for an off-channel storage dam. The results similarly show that on average, surplus flow occurs between January and September, during which period constant abstraction to the proposed Haib Mine would be possible.
- A second phase of the WRWD analysis entailed the use of "synthetically" generated flow sequences termed the stochastic analysis. The stochastic analysis was used to analyse 201 stochastic flow sequences and is used to provide a far better indication of the assurance of supply, specifically for high supply assurances such as 99% (1 in 100 years) and 99.5% (1 in 200 years), for which the historic flow sequences of 85 years are too short to use for accurate

indications. Due to greater complexity and computational demands, selected scenarios were assessed using stochastic flow sequences.

- Since a large number of flow sequences are generated for the stochastic analyses, these typically encompass a greater range (or envelope) of values than the historical flow sequence (which is only one sequence). Assessments of climate change modelling, including that by Rooyen & Jahnke (van Rooyen & Jahnke, 2021) found that the lowest stochastically generated sequences generate flows lower than those from the six Global Climate Models assessed by their 2021 assessment, indicating that the stochastic flow sequences encompass lower flows than those indicated by climate change modelling and therefore include the possible impacts of climate change.
- The stochastic modelling indicates that a demand of 20 Mm³/a by Haib Mine, supplied during periods of surplus flow via an off-channel storage dam to avoid impacts to other users, can be supplied with a 95% assurance of supply. The analysis shows that for 35% of the years the supply to the Haib demand is at a 100% assurance of supply.

A summary of results shows, based on primary evidence, that there are risks to the assurance of supply in the dry months, which places both the Mine project and downstream users at risk. To avoid these risks, the Project will utilise off-channel storage during periods where surplus water is available. This will result in no impact on the assurance of supply to both the Mine project and downstream users. A risk to water availability to the Mine remains in the uncertainty of climatic variance. A key consideration is the abstraction operating rules, which will dictate the temporal requirements to ensure a no-impact scenario and directly draw from flow rates at Blouputs. The specific requirements will be sourced from the DWS Annual Operating Analysis. Results of historical analyses of flows in the lower Orange River, across all development scenarios (inclusive of the 2035 development scenario), show that surplus flows and off-channel storage dam (to avoid impacts to downstream users), are always sufficient to supply the Mine's water demand at 100% assurance. Results of stochastic, or simulated flows, inclusive of climate change scenarios, show the demand of 20 Mm³/a by the Haib Mine, supplied during periods of surplus flows via and off channel storage dam (to avoid impacts to downstream users), can be supplied with a 100% assurance for 35% of years but never drops below 95% assurance of supply.

Haib Mine Construction Demand of 3.5 Mm³/a

- The use of an off-channel storage dam by the Haib Mine to mitigate impacts of the construction demand of 3.5 Mm³/a will not be possible during the construction phase as no dam will yet be available (the construction water will in part be needed for the construction of the off-channel storage dam). The abstraction to supply the construction demand will need to be supplied from the ORP (i.e. relying on releases from the Gariep and Vanderkloof dams)(Figure 1-1). Based on the results of the WRWD study and the current status of the ORP, this will impact the assurance of supply to downstream users. This however does not mean there will be an impact over the short construction period, as this will depend on climatic events over the 2-3 year period of construction.
- Take note that the assurance of supply is defined as the probability that a water resource system will consistently meet consumer or sector demands without failure at the given assurance level. Restriction during adverse conditions like droughts will be limited to that relating to the given assurance level.
- The increased probability of impacts on assurance of supply will only materialise if the resource needs to be protected from total failure (dams running empty) by means of restrictions. On an annual basis, the abstraction for construction, through the Water Abstraction Licensing process with MAFWLR, will need to be catered for through increased minimum flow requirements at the Blouputs gauging station and increased releases from Vanderkloof Dam. This means if the water level in the Vanderkloof and Gariep is high enough, the construction demand of 3.5

Mm³/a over 2-3 years can be supplied to the proposed Haib Mine construction phase. The WRWD study assessed the impacts of 6 Mm³/a and resulted in a small impact (when compared to total yield of the system) meaning the continuous abstraction (if supplied by upstream dams) will not have a significant impact on total assurance of supply. To place the Haib Copper Projects' construction demand volume into context, it only constitutes 0.4% (Construction demand being 0.11m³/s and annual average minimum flow at Blouputs 27 m³/a) of the annual average minimum flow requirements set at Blouputs which represents all water requirements downstream of Blouputs. This low percentage of total water required results in a low magnitude impact and the short/temporary requirement period (2-3 years) results in a low probability of impact. Impacts on assurance of supply will only be introduced when the upstream dams are at a too low storage level. In such an event, water abstraction by all users will need to be reduced proportionally and in accordance with the priority categories for the different water use sectors per the system operating rules.

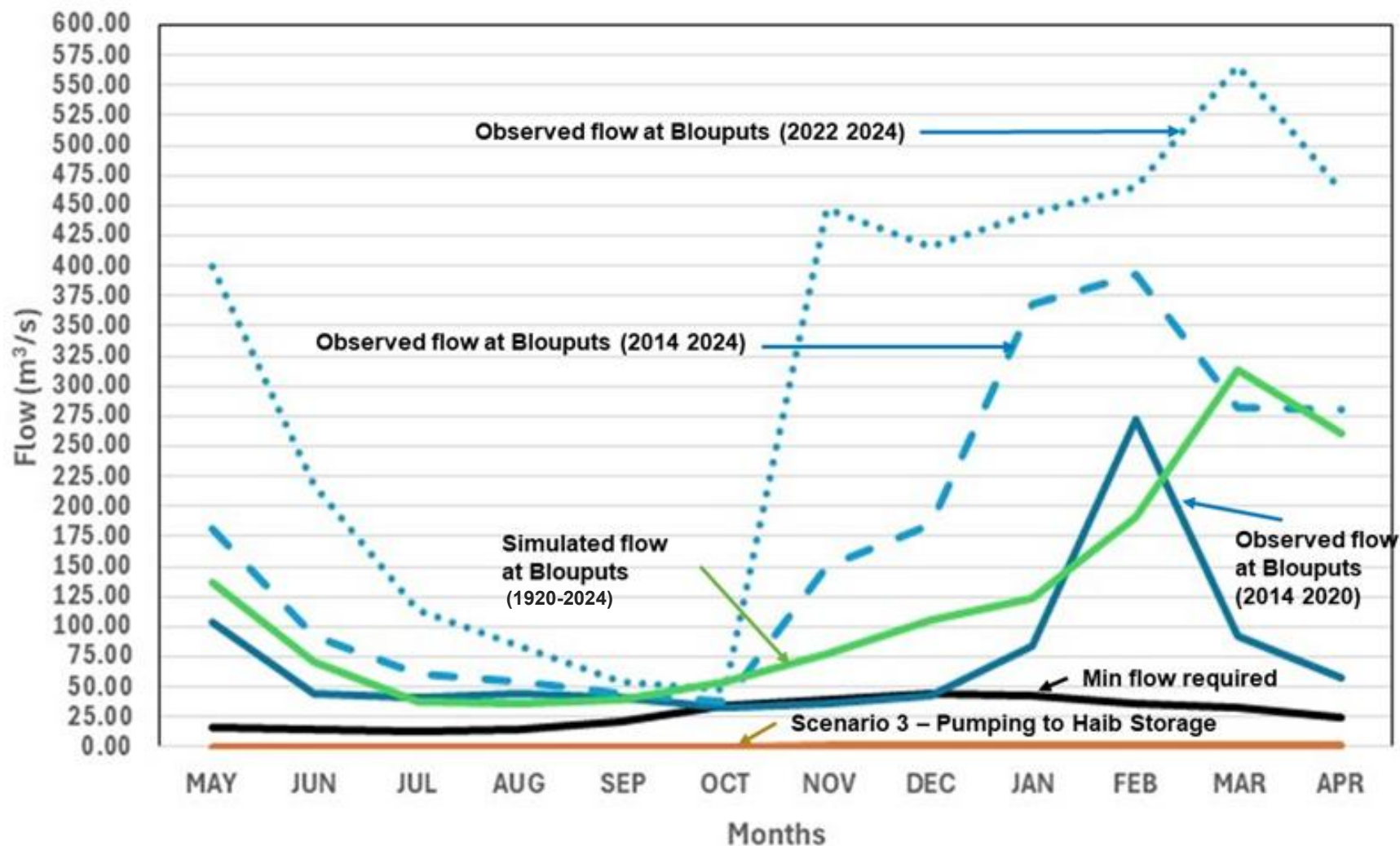


Figure 1-3: Average monthly flows at Blouputs (Observed since 2014 and simulated since 1920)

Climate Change Considerations

Detailed work to investigate the impacts of climate change on the Orange-Senqu Basin was undertaken as part of the study by ORASECOM entitled *Preparation of climate resilient water resources investment strategy & plan and Lesotho-Botswana water transfer multipurpose transboundary project*, which was reported on under the Climate Change Report, Document No. 007/2019 dated August 2021 (van Rooyen & Jahnke, 2021). The results were integrated in this study through the Water Resources and Water Demand Study (**Error! Reference source not found.**).

The impact of climate change on the Orange-Senqu Basin was investigated by using six Global Climate Models (GCMs) and two scenarios. The climate models were downscaled and bias-corrected to obtain acceptable regional meteorological trends, correlating with historic data within the accepted Southern African Hydrology.

The six Global Climate Models that were downscaled were:

- Australian Community Climate and Earth System Simulator (ACCESS1-0), hereafter referred to as ACC.
- Geophysical Fluid Dynamics Laboratory Coupled Model (GFDL-CM3), hereafter referred to as GFD.
- National Centre for Meteorological Research Coupled Global Climate Model, version 5 (CNRM-CM5), hereafter referred to as CNR.
- Max Planck Institute Coupled Earth System Model (MPI-ESM-LR), hereafter referred to as MPI.
- Norwegian Earth System Model (NorESM1-M), hereafter referred to as NOR.
- Community Climate System Model (CCSM4), hereafter referred to as CCS.

The bias-corrected climate change rainfall and evaporation data were used to determine the impacts on the natural runoff in the basin. This was done for two scenarios, including bias-corrected climate change rainfall for scenario 1 and bias-corrected rainfall and evaporation for scenario 2. The Pitman Model was programmatically re-run for the 11 sub-systems containing 119 runoff units for the six climate change models and two scenarios. These natural runoff, rainfall and evaporation datasets were compiled as inputs for the Water Resources Yield Model (WRYM). The WRYM was used to determine the yields for the four separate sub-systems, consisting of the Lesotho Highlands Water Project (LHWP), the Greater Bloemfontein Water Supply Scheme (GBWSS), Makhaleng Dam, and the Orange River Project (ORP). A constant development level of 2030 was used for these analyses. The changes in yield for the six climate change models and two scenarios were then compared to the firm yield determined for each of the four systems based on the historic hydrology before climate change impacts.

The Historic Firm Yield (HFY) for the Orange River project using the historic flows without any climate change impacts is 3 339 Mm³/a.

The firm yield results based on the climate change-impacted hydrology are presented in Table 1.2, along with the respective percentage difference compared to the HFY.

The changes in runoff and subsequent changes in yield for the ORP are relatively small, with five of the six GCMs producing consistent decreases in runoff with an average decrease in yield of 4% for scenario 1 and an 8% decrease in yield for scenario 2.

Table 1.2: Firm yield obtained for the Orange River Project from different climate change models and scenarios (van Rooyen & Jahnke, 2021)

Description		Firm Yield for 85-year Simulation Period (Mm ³ /a)		Percentage Difference of the Firm Yield Results for the Climate Change Scenarios Compared to the Historical Firm Yield	
Sub-System	Global Climate Model (GCM)	Scenario 1 (Adjusted Rainfall)	Scenario 2 (Adjusted Rainfall and Evaporation)	Scenario 1 vs. Historical Firm Yield	Scenario 2 vs. Historical Firm Yield
Orange River Project (ORP)	ACC	3 194	3 011	-4%	-10%
	CCS	3 116	2 927	-7%	-12%
	CNR	3 060	2 974	-8%	-11%
	GFD	3 702	3 665	11%	10%
	MPI	3 037	2 853	-9%	-15%
	NOR	3 175	3 011	-5%	-10%
	Average	3 214	3 074	-4%	-8%

The general consensus noted in van Rooyen & Jahnke (van Rooyen & Jahnke, 2021) is that the rainfall will decrease towards the north west and the evaporation will increase, however, over the eastern parts of the catchment there is no general consensus over the magnitude and direction of change, noting also some inherent uncertainty in using the GCMs.

The assessment by van Rooyen & Jahnke (van Rooyen & Jahnke, 2021) found that the lowest stochastically generated sequences generate flows lower than those from the GCMs, indicating the value and importance of using a stochastic simulation method, as this encapsulates the potential impacts of climate change.

This means that if the hydrology is updated and stochastically analysed consistently after the occurrence and recovery of severe droughts, the results will be able to guide managers to plan for potential shortfalls and to engage restrictions sooner, use more efficient operating rules or to implement interventions in a timely manner. These considerations are included under the stochastic analysis undertaken in the WRWD study.

2.0 COMMENTS AND RESPONSES: EIA FEEDBACK

The following feedback queries were made during the consultation period of the two EIAs described:

Comment	Response
Was climate change considered in the WRWD analysis?	Yes, climate change was considered under the stochastic (future) analyses.
Were future developments considered in the WRWD analysis?	The analysis looked at two development levels inclusive of current (2024) and future (2035) development level. The Water Resources Planning Model (WRPM) includes the total Lesotho, Molopo and Nossob catchments in Botswana, the Lower Orange, the Fish River and Nossob River in Namibia and a large portion of RSA which includes the Orange, Molopo, Vaal River and all related tributaries. It was set up as part of the ORASECOM Phase III study and updated in 2024 and 2025. The WRPM was used to inform the WRWD analysis in historic mode (2024 current development level). Flows were then simulated for the 2035 development level and used to inform the analysis. Future development data was obtained from the ORASECOM studies (described above) and from the 2024 Orange AOA using the latest available updates. Take note that the specialist who is currently appointed by DWS to manage and update the WRPM is the same specialist that undertook the WRWD assessment. This was intentional to ensure direct alignment of results with DWS the South African water management agency.
The report states that taking 20 Million m ³ /a from the Orange River is small. Have the cumulative impacts of abstraction been assessed?	The reference to small is in comparison to the total volume in- and yield of the Orange River. The cumulative impacts of the 20 Million m³/a abstraction is assessed through the WRPM. The WRPM is designed to evaluate the combined, long-term impacts of multiple factors including population growth, climate change, infrastructure development, and environmental requirements on water availability. The model is thus cumulative by nature.
Page 114 of the WRWD report states 6 Million m ³ /a can be supplied 100% of the time although in 2016 flow was almost zero?	The specific point 3, refers to the scenario that releases are made specifically for the Haib development from Gariep and Vanderkloof Dams. The implementation of the minimum flows at Blouputs Gauging Weir (in 2020) that trigger releases from Vanderkloof Dam to manage deficits downstream was implemented in 2020 to manage deficits seen in 2016 and 2019. The specific this scenario (under point 3) would require an increase of the minimum flows at Blouputs to account for the Haib mine requirements and essentially be provided 100% of the time.
Is the Blouputs station currently operational?	The gauging station at Blouputs (D8H014) is operational. Flow data is available from 2014 to current 2026 (note that a delay of about a day for data to be read and included online) Data from the Sendelingsdrift Station (D8H015) is also available near-real time. The Blouputs station is managed

Comment	Response
	through the regional farmers forum. Data is available from the following sources via the DWS (SA) website: https://www.dws.gov.za/Hydrology/Daily/Default.aspx https://www.dws.gov.za/Hydrology/Verified/HyDataSets.aspx?Station=D8H014&SiteDesc=RIV https://www.dws.gov.za/niwis2/SurfaceWaterMonitoringNetwork The gauging station at the Vioolsdrift Bridge (D8H009) is active and data is available from 1979 to 2026. The gauging station at the Vioolsdrift Weir (D8H010) at the irrigation offtake is however closed and non-operational, with data available between 1958 and 1971.
Will there be a gauging station developed at the Haib abstraction point? Or Noordoever/ Vioolsdrift?	The EMP requires a flow monitoring programme to be implemented towards both informing abstraction periods as well as adaptive management of impacts. The specific mechanism will be determined by the development. The development of a flow gauging station is currently proposed in the NamWater Application for ECC (Described on page 1). Downstream river flows can be gauged at the Vioolsdrift Bridge (D8H009) as currently. The flow withdrawn by NamWater will be metered and the volumes abstracted submitted to the Namibian MAFWLR in accordance with permit requirements. It is expected that Namibia's MAFWLR will compile the total withdrawals from Namibian water users along the Orange River and report to ORASECOM.
What is the confidence level that low flows set at Blouputs that trigger released from Vanderkloof Dam are sufficient. What is the process of determining these low flows?	The minimum flows at Blouputs (and other gauging stations) are updated on an annual basis by a consultant appointed by DWS (SA). The low flows are determined based on the updated water use information obtain each year from the various countries, and using the WRPM to provide the simulated flow data at the different monitoring sites. These minimum flows are then first discussed with DWS (SA) and then presented to all the users and interested parties at the Stakeholder Operation Forum (SOF) meeting each year. All water users are urged to join this meeting (Namibia included). All comments received are looked into and further adjustments are made when required. The quantification of these flows are part of the formal process of updating the Annual Operating Analyses.
What is the confidence level that DWS will effectively make releases to the Lower Orange River?	DWS have to date released water for the Lower Orange River in accordance with the Annual Operating Analyses and other plans/requirements. DWS Northern Cape have the discretionary allowance of 70 Mm³/a which can be utilised to increase the flows in the Lower Orange River when heatwave conditions are experienced to avoid shortfalls as experienced in 2016 and 2018/19.

Comment	Response
What is the contingency plan if surplus flows are not sufficient to achieve the demand such as the low flow/ drought periods seen in 2016 and 2019.	The project is currently in pre-feasibility study (PFS) phase and investigations are ongoing. The feasibility of the Orange River as a water supply option is positive and thus being advanced. Although the WRWD assessment informs the impact assessment process, it also informs the development in terms of feasibility of supply. If the risk of low flow/ drought is not accepted by the developers, after effective design options and optimisations have been considered, then this effects feasibility of the project. The EMP includes that abstraction must only take place during periods of surplus flow i.e. guided by low flows at Blouputs towards ensuring downstream users are not affected. The risk of insufficient water during these surplus periods lies with the development and the accepted level of assurance. One contingency is that depending on the results of ongoing stochastic analysis, the level of assurance can be altered with varying off channel storage dam size. It depends on the development's appetite for risk. Another contingency is the Neckartal pipeline which remains under investigation during this PFS phase.
Will the proponent request water to be released from SA, during multiple and consecutive years of drought? To ensure they can have surplus flow? And when will this be timed for?	DWS SA should release water from the u/s dams in the Orange River when the flows drop below the minima values set for the Blouputs gauging location. Should water not be available in these dams due to multiple years of consecutive droughts, water use from the river will be curtailed for all users according to the operating rules of the system. This will also affect water use by the Mine which will be reduced in accordance with these operating rules.
Will the pumps be suitably scaled to allow for shorter abstraction period (to achieve the required volume) and was this consideration included anywhere as an alternative etc.	The operation of the pumps will be able to be scaled depending on flow in the river, up to a maximum of 2m ³ /s, which pump rate would provide the shortest abstraction period.
Could the team provide a map of the localities of the features described in the WRWD report	See Figure 1-1
Has Gariep Watch and Rosh Pinah been included as an I&AP?	The team has reached out to these stakeholders and included them in the database of registered I&APs.
Haib Minerals commissioned the WRWD study however NamWater are applying for the Water Abstraction License. How does this relationship work?	The development of the proposed Haib Mine by Haib Minerals requires a sustainable water source to support its operational and processing activities. NamWater intends to provide this service through the abstraction of water from the Orange River and conveyance to the off-channel water storage dam During the development of the Project, the identification of partnership opportunities between the, Haib Minerals and NamWater were identified. This coincided with the scoping phase of the EIA process. The

Comment	Response
	partnership identified involves the handover of ownership and operation of the water abstraction and supply infrastructure from Haib Minerals who will construct the facilities, to NamWater, who will maintain and operate the scheme under an agreed volumetric tariff structure supporting the Haib Copper Mine. This aligns with Namibia's 2008 Water Supply and Sanitation Policy and NamWater's policy and practice. A Memorandum of Understanding (MoU) between the two parties has been completed and further agreements are under development. To be clear, although the ECC application is made by NamWater who will operate the facility, the financing of infrastructure development is aligned with the development of the Haib Copper Project through Haib Minerals. Specialist studies for the entire project, inclusive of the mining activities and water abstraction activities, were commissioned prior to this partnership. Regardless of who commissioned the reports, as the activities remain the same the content in the specialist studies remain independent and valid. Knight Piésold Consulting (Pty) Ltd Namibia (KP) was appointed by Koryx to support the development of environmental scoping and impact studies associated with the application for an ECC for Haib Mining, as well as the application for an ECC for water abstraction and supply activities on behalf of NamWater.
What water rights have been issued and what water rights are actually been used (particularly for Namibia)? How much water has Namibia been allocated and what rights do they have to obtaining this water from the system?	The project team has reached out to the Namibian MAFWLR on numerous occasions to answer this question. However, the Ministry does not release permit information to members of the public.
<i>On page 3 it states: If the water required for the Haib Mine is supplied from the ORP (i.e. relying on releases from the Gariep and Vanderkloof dams), the number of years with restrictions increased from 7 (without Haib Mine) to 9 (out of the 85 years assessed). When water is supplied from the ORP at the 2024 development level, it will thus impact the assurance of supply to other users. This impact is however relatively small. Is it reasonable to say that the impact is relatively</i>	The interpretation of the report is very important and an increase in risk of restriction is not comparable to a failure in the system. The increase in risk should rather be determined by comparing $7/85=8.2\%$ (meaning only 8.2% of the years were restricted) with $9/85=10.6\%$ thus an increase of only 2.4%. Furthermore, it is evident from Table 4-3 that the average restriction for Base Scenario 1 was 12% and the average for Scenario 1 was 14%, thus an increase of only 2%. This is where the “relatively small” comment comes from. We agree a specific definition of “restriction” would be helpful here but essentially is any reduction in supply (could be a lot and could be a little). See below Table 4-3 from the report which speaks to the 7 years where restrictions would have implemented at 2024 development level- the focal column is “base

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small? The increase from 7 to 9 (out of 85 yrs) represents a 30% increase in risk. A failure in the system could mean that permanent crops (e.g. vines and date trees) will die. This will push farms into bankruptcy. It doesn't feel like a 30% increase in risk is small given the dire consequences of the event taking place. The severity of the event (restrictions) is not defined which also makes any assessment even more difficult. I understand the facts are based on Haib being dependent on releases from the Gariep and Vanderkloof and this is not what you are proposing but the principal of saying the impact is small is surely not correct.	1" which shows based on all users in 2024 (excl. Haib abstraction), that these 7 years there would have been restrictions (if the 2024 development level was in place since 1933). See in 1987 there was a restriction of 1% of water which is licensed but the worst case would have been 36% in 1933. Scenario 1 is the scenario you refer to in your query and includes Haib abstraction and see the additional restricted years in 1947 and 1985 (rounded). Table 4-3: Years when restrictions were required for the ORP System and the related severity of the restrictions (2024 development level) <table><tr><th rowspan="2">Years</th><th colspan="5">% Supplied</th><th colspan="5">% Restriction</th><th colspan="5">Supply volume reduction (million m³/a)</th></tr><tr><th>Base 1</th><th>Scenario 1</th><th>Scenario 1b</th><th>Scenario 2*</th><th>Scenario 2b+</th><th>Base 1</th><th>Scenario 1</th><th>Scenario 1b</th><th>Scenario 2*</th><th>Scenario 2b+</th><th>Base 1</th><th>Scenario 1</th><th>Scenario 1b</th><th>Scenario 2*</th><th>Scenario 2b+</th></tr><tr><td></td><td>91%</td><td>88%</td><td>89%</td><td>91%</td><td>90%</td><td>9%</td><td>12%</td><td>11%</td><td>9%</td><td>10.3%</td><td>327</td><td>429</td><td>381</td><td>327</td><td>357</td></tr><tr><td>1933</td><td>64%</td><td>63%</td><td>64%</td><td>64%</td><td>64%</td><td>36%</td><td>37%</td><td>36%</td><td>36%</td><td>36.3%</td><td>1,244</td><td>1,301</td><td>1,262</td><td>1,244</td><td>1,258</td></tr><tr><td>1947</td><td>100%</td><td>98%</td><td>98%</td><td>100%</td><td>99%</td><td>0%</td><td>2%</td><td>2%</td><td>0%</td><td>0.8%</td><td>8</td><td>70</td><td>53</td><td>8</td><td>26</td></tr><tr><td>1970</td><td>68%</td><td>64%</td><td>66%</td><td>68%</td><td>66%</td><td>32%</td><td>36%</td><td>34%</td><td>32%</td><td>33.6%</td><td>1,119</td><td>1,240</td><td>1,188</td><td>1,119</td><td>1,162</td></tr><tr><td>1971</td><td>95%</td><td>94%</td><td>94%</td><td>95%</td><td>95%</td><td>5%</td><td>6%</td><td>6%</td><td>5%</td><td>5.0%</td><td>170</td><td>196</td><td>191</td><td>170</td><td>174</td></tr><tr><td>1984</td><td>100%</td><td>100%</td><td>100%</td><td>100%</td><td>100%</td><td>0%</td><td>0.2%</td><td>0.0%</td><td>0%</td><td>0.0%</td><td>0</td><td>8</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1985</td><td>78%</td><td>73%</td><td>76%</td><td>78%</td><td>77%</td><td>22%</td><td>27%</td><td>24%</td><td>22%</td><td>23.2%</td><td>755</td><td>934</td><td>832</td><td>755</td><td>804</td></tr><tr><td>1986</td><td>97%</td><td>96%</td><td>96%</td><td>97%</td><td>97%</td><td>3%</td><td>4%</td><td>4%</td><td>3%</td><td>3.1%</td><td>98</td><td>123</td><td>123</td><td>98</td><td>106</td></tr><tr><td>1987</td><td>99%</td><td>98%</td><td>98%</td><td>99%</td><td>98%</td><td>1%</td><td>2%</td><td>2%</td><td>1%</td><td>1.5%</td><td>44</td><td>70</td><td>64</td><td>44</td><td>52</td></tr><tr><td>Average</td><td>88%</td><td>86%</td><td>87%</td><td>88%</td><td>87%</td><td>12%</td><td>14%</td><td>13%</td><td>12%</td><td>12.6%</td><td>418</td><td>486</td><td>455</td><td>418</td><td>438</td></tr></table> The sentence stating “the impact is however relatively small”- is not material to the outcomes of the study and mitigation put in place. The decision to use off channel storage completely negates the need for releases from Vanderkloof to supply the mine and takes the surplus abstraction route which does not have impacts on restrictions (i.e. fully avoids impact on downstream users).	Years	% Supplied					% Restriction					Supply volume reduction (million m ³ /a)					Base 1	Scenario 1	Scenario 1b	Scenario 2*	Scenario 2b+	Base 1	Scenario 1	Scenario 1b	Scenario 2*	Scenario 2b+	Base 1	Scenario 1	Scenario 1b	Scenario 2*	Scenario 2b+		91%	88%	89%	91%	90%	9%	12%	11%	9%	10.3%	327	429	381	327	357	1933	64%	63%	64%	64%	64%	36%	37%	36%	36%	36.3%	1,244	1,301	1,262	1,244	1,258	1947	100%	98%	98%	100%	99%	0%	2%	2%	0%	0.8%	8	70	53	8	26	1970	68%	64%	66%	68%	66%	32%	36%	34%	32%	33.6%	1,119	1,240	1,188	1,119	1,162	1971	95%	94%	94%	95%	95%	5%	6%	6%	5%	5.0%	170	196	191	170	174	1984	100%	100%	100%	100%	100%	0%	0.2%	0.0%	0%	0.0%	0	8	0	0	0	1985	78%	73%	76%	78%	77%	22%	27%	24%	22%	23.2%	755	934	832	755	804	1986	97%	96%	96%	97%	97%	3%	4%	4%	3%	3.1%	98	123	123	98	106	1987	99%	98%	98%	99%	98%	1%	2%	2%	1%	1.5%	44	70	64	44	52	Average	88%	86%	87%	88%	87%	12%	14%	13%	12%	12.6%	418	486	455	418	438
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I see your comment on cumulative effects in the Q&A but do we have a view on the accuracy of the demand figures you are using. How many other applications are in process for water rights in Namibia, South Africa, Botswana and Lesotho? Are they all part of the demand figures you are using? And of course do the countries have the rights to be granted. There have been a number of ESIA applications over the recent past which all required more water – have these rights been issued and taken into	The last overall update of all the water requirements and infrastructure in the system was made as part of the ORASECOM Study “PREPARATION OF CLIMATE RESILIENT WATER RESOURCES INVESTMENT STRATEGY & PLAN AND LESOTHO-BOTSWANA WATER TRANSFER MULTIPURPOSE TRANSBOUNDARY PROJECT” completed in 2020. Data inputs were provided by all four the countries and agreed on. Since then, the WRPM was updated each year as part of the Annul Operating analysis by DWS RSA. The focus of these updates is on key demands from the larger water supply system. During this period ORASECOM also launched a training study to involve all four countries in the annual operating analysis carried out by them at the same time as DWS RSA. During those periods data on water requirements were also shared between the ORASECOM work and the DWS RSA study. Every year as part of the annual operating analysis																																																																																																																																																																																															

Comment	Response
account?	updated information is obtained from Namibia regarding their irrigation, mining, and domestic use along the Lower Orange. It is taken into consideration in these studies that water abstraction licenses issued by Namibia are not necessarily fully developed.
Do we know how much water Namibia has actually been granted from Orasecom and how this lines up with actual water rights issued? Attached is 2018 report that says that water rights in Namibia have been issued totalling 65m cubes in Aussenkehr (aside from the 64m cubes that were being applied for as a part of the ESIA). There are obviously lots of users outside of Aussenkehr. We don't know the volume that Namibia has a right to allocate but we have seen numbers of between 50m and 70m.	This is unclear- as you say we could run a rough calculation of water users to try quantify this but we have had no formal response from the regulator on answering this question
Did you look at plotting observed flow at Blouputs for just 2015-2016? (i.e. the worst years on record)	Plotting observed flows at Blouputs: Figure 1-2 shows observed flows plotted at Blouputs (orange). These low flows and those in 2019, as we understand, directly resulted in the minimum flows being implemented at Blouputs.
How can we understand the minimum flow further? Is it based on actual water rights issued by all countries, actual usage, estimates, etc? Is it ever reconciled with actual flow levels?	The water requirements are based on licences or allocations in combination with actual development where it is available. These are then all built into the model including the river losses of which evaporation is the largest component as and also including the environmental requirements as well as operating losses. An analysis with the model is then carried out to determine the minimum flows required at Blouputs that is needed to still be able to supply the downstream users, evaporation losses, operating losses and environmental requirements. These minimum flows are then adjusted to take into

Comment	Response
	account the lag time between Vanderkloof and Blouputs. These flows are used in the monitoring report prepared as part of the annual operating analysis. In the monitoring report the observed flow at Blouputs is on a weekly basis compared with the minimum flows. These comparisons, until now, has proven to relate well with the deficits experience in the lower Orange since the implementation of the minimum flows.
I know it is not your map but do you know why Vioolsdrift is not on the map for question 10 (page 15)?	This is unclear. The gauging station at the Vioolsdrift Bridge (D8H009) is active and data is available from 1979 to February 2026 (see comment above re data availability and processing). The gauging station at the Vioolsdrift Weir (D8H010) at the irrigation offtake is however closed and non-operational, with data available between 1958 and 1971.
Instead of using Blouputs as the minimum flow gauging point why are you not using Vioolsdrift (D8H009) since it is much closer. This will have a much better reflection of reality as we believe the consumption between Blouputs and Noordoewer can be substantially more than expected (especially in times of low flow and heat waves) Remember that it is perhaps 21 days of elapsed time from releasing water from the Vanderkloof to it arriving in Aussenkehr – i.e. releasing water when low flow is observed can still be very detrimental	Blouputs is used to measure the minimum flows and trigger upstream releases as it is more accurate than the gauging location at Vioolsdrift which is at the bridge, which is typically a less accurate measurement than at a dedicated gauging weir such as Blouputs. Minimum flows were already determined for Blouputs as part of the annual operating analysis and is used as one of the key points to check in the annual monitoring report of the Orange River System.
Have you done a full analysis on optimising pumping capacity and dam size versus risk/cost/etc.? Of course, the off-site storage and pumping in peak is good for reducing risk. Anecdotally, banking on being able to extract for 121 days every year seems very aggressive and full of risk for all.	Optimisation analyses have been conducted by investigating different pumping rates and dam storage volumes which show that as the pumping (abstraction) rate is increased, the dam volume is reduced, as it can be filled more quickly. A relative optimum is found at a pumping rate of 2 m ³ /s. Further assessments were conducted between different peak and average pumping rates, which also indicated a relative optimum pumping rate of 2 m ³ /s. The 121 days is an equivalent period for pumping the required volume at the peak abstraction rate of 2 m ³ /s. Assessments of required abstraction rates and periods are on-going, and without pre-empting these, early indications are that surplus flows are available for a longer period throughout the year which could mean abstraction at lower rates for longer durations.

Comment	Response
There is a reference to the Water Abstraction Management Protocol in the EMP. Can we please see this document?	The principles of the Water Abstraction Protocol (termed in the EMP as a framework) are included in the EMP of the proposed Water Abstraction and Supply Activities by NamWater- see section 4.2.5. A finalised Water Abstraction Protocol is however not available at the time of development of the EMP as this protocol is a living document that will require periodic updates based on updated requirements and operational clarity. The fundamental principle of the Water Abstraction Protocol remains the measure that ensures the mitigation of impacts to water availability on downstream users. The principle that no abstraction may take place during periods outside of “Surplus” flow which is captured in the EMP. The details of “how” this will be achieved are outlined in the principles of the Water Abstraction Protocol. The classification of “surplus” is directly linked to independent operation of the Orange River Basin (Through the Annual Operating Analysis by DWS SA). This principle will not change and is deemed sufficient to be able to guide abstraction as well as assess the probability of a risk of non-compliance. Take note in Namibia the EMP forms part of the conditions of the ECC which is a legally binding document of which non-compliance with conditions therein may result in criminal prosecution or revoke of the ECC.
If no discharge is planned, where are the expected water losses? What is the water balance of the operation?	No discharge back to the Orange River as the Haib Copper Mine will have a negative water balance due to: 1. Little natural water inputs into the mining process / system, due to: a. Low groundwater inflows into the mine pit due to the low rainfall recharge and the low aquifer yield. b. Low direct rainfall onto the pit and the TSF (the average rainfall is 25 to 50 mm/a). 2. High water losses, due to a combination of: a. Evaporation from the pit - this is a very arid area, with 1 900 mm/a. b. Evaporation from the TSF pond - again at 1 900 mm/a. c. Water that is used to pump the slurry to the tailings storage facility being captured in the TSF. d. Water being used for ancillary purposes such as dust suppression/workshops/domestic uses etc.

Comment	Response
	From the above, it can be expected that there will be a water deficit to be able to run the processing plant. This deficit will be made up from abstracting water from the Orange river. The abstracted water will be stored in a water holding dam to ensure a sufficient buffer to be able to operate the mine continuously throughout the year. There will also be high evaporation from the holding dam, further increasing the make-up water requirement.
If water is lost through soils, what is the possibility that the contamination will reach the Orange River and impact farmers?	Potential ground water contamination is a typical concern in these types of mining projects. In this case the risk to Orange River which is not taken lightly and we have comprehensively investigated in the Mine EIA. The team has assessed this specifically through the Hydrogeological (where do we expect water to move) and Geochemical assessments (what contaminants and what concentrations do we expect). The Hydrogeological Specialist Study will be included as an appendix in the proposed Haib Mine EIA and will be shared for comment once available.
Mining and beneficiation activities near the Orange River may pose a significant risk to water quality via airborne dust, surface flow and subsurface flow.	These contaminant pathways have been identified and included in the EIA terms of Reference. Detailed hydrogeological specialist study inclusive of geochemical analysis (both static and kinetic testing) has been completed. Results are available in the Haib Mine EIA and annexures and show across temporal scenarios, pre mitigation, that migratory plumes are expected with local (on site) migration of low quality leachate. Low quality leachate is comparable to background ground water quality and thus impact of the on site aquifers expected to be limited. Migration occurs towards the Orange River however is predicted to remain on site prior to mitigation. These expected results are to be further mitigated through appropriate engineering interventions supported by extensive monitoring programmes. Air Dispersion Modelling of PM2.5 and PM10 was undertaken across scenarios. Based on the ADM report, emitted particles will deposit within the Orange River and off-channel storage facility. While these dust fall rates can be modelled, the chemical composition of deposited material is unknown and thus are currently unable to quantify resulting mass loadings to these aquatic environment. The risk is included here regardless as a gap and recommendations for further study during mine phases are included in the EMP

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