

REVISION 1.0

16 September 2026

Element Consulting Engineers
82 Victoria Street
George
Southern Cape
6530

Attention: Mr Hannes Lourens

Dear Sir,

PROPOSED DEVELOPMENT OF FARM 219/RE, MOSSEL BAY: CAPACITY ANALYSIS OF THE BULK WATER & SEWER SERVICES

Your request regarding comments on the bulk water and sewer supply to the proposed development (mixed-use development on the Farm 219/RE, Mossel Bay), refers.

This document should inter alia be read in conjunction with the following reports:

- “Mossel Bay Municipality Water Master Plan”, dated June 2025.
- “Mossel Bay Municipality Sewer Master Plan”, dated June 2025.

The proposed development on Farm 219/RE was not taken into consideration for the June 2025 master plans for the water and sewer networks.

1 WATER DISTRIBUTION SYSTEM

1.1 Distribution zone

The proposed development should be supplied with bulk water from the existing Vaale Valley reservoir distribution zone. The Vaale Valley reservoir has a storage capacity of 7,0 ML and a Top Water Level (TWL) of 155,7 m above sea level (m a.s.l.)

The proposed connection to the existing system should be on the existing 400 mm Ø pipe in the R102 Main Road, as shown in Figure 1 attached.

The development is situated inside the water priority area.

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1.2 Water demand

Development on Farm 219/RE was not taken into consideration for the June 2025 master plan for the water network.

The total annual average daily demand (AADD) and fire flow, for the proposed mixed-use development on Farm 219/RE was calculated and classified as follows:

• 200 Hospital beds @ 0,6 kL/bed/d ⁽¹⁾	=	120,0 kL/d
• 2 600 School students @ 0,06 kL/student/d ⁽¹⁾	=	156,0 kL/d
• 450 Tertiary Education students @ 0,06 kL/student/d ⁽¹⁾	=	27,0 kL/d
• 136 Hostel students @ 0,3 kL/student/d ⁽¹⁾	=	<u>33,0 kL/d</u>
Total	=	344,0 kL/d

⁽¹⁾ As per Tables J.4 from Section J - Water Supply of "The Neighbourhood Planning and Design Guide" (so called "Red book").

• Fire flow criteria (Moderate risk 1) ⁽²⁾ = 25 L/s @ 10 m

⁽²⁾ As per Table J17 from Section J - Water Supply of "The Neighbourhood Planning and Design Guide" (so called "Red book"). For fire flows > 20 L/s, i.e. the High risk, Moderate risk 1 and Moderate risk 2 categories, lower flows may be allowed on the basis of a fire specialist report.

1.3 Present situation

1.3.1 Reticulation network

The proposed connection to the existing system should be done to the existing 400 mm Ø pipeline, along the R102 Main Road, as shown in Figure 1 attached.

There is sufficient capacity in the existing Vaale Valley reservoir water distribution zone to accommodate the proposed development in order to comply with the pressure and fire flow criteria as set out in the master plan.

1.3.2 Bulk supply

The existing bulk supply system from the Little Brak Water Treatment Plant (WTP) to the Vaale Valley reservoir has sufficient capacity to accommodate the proposed development.

1.3.3 Reservoir capacity

The criteria for total reservoir volume used in the Mossel Bay Water Master Plan is 48 hours of the AADD (of the reservoir supply zone).

According to this re-analysis of the fully occupied AADD scenario for the Vaale Valley reservoir water distribution zone, the AADD for the distribution zone can potentially increase to approximately 469 kL/d when the development has been fully developed. The storage capacity of the existing Vaale Valley is 7 000 kL, which results in a storage capacity of 358 hours of the AADD.

Therefore, there is sufficient capacity in the Vaale Valley reservoir to accommodate the proposed development.

1.3.4 Static pressures & fire flow

The static pressures (as well as peak demand pressures) of the proposed development on Farm 219/RE will exceed 95 m of pressure head if the water supply from the Vaale Valley reservoir is not controlled. It is therefore recommended that pressure management is implemented privately for development on Farm 219/RE.

Furthermore, there is sufficient capacity in the existing system to provide a fire flow of more than 25 L/s @ 10 m to the proposed connection point of the development. It should, however, be noted a minimum diameter of 160 mm is required for the internal (private) pipelines, between the proposed connection point and the Critical Point (CP) of the development, to allow for sufficient fire flow within the development area.

2 SEWER NETWORK

2.1 Drainage area

The proposed development on Farm 219/RE should be accommodated in the existing Hartenbos Wastewater Treatment Plant (WWTP) drainage area. The proposed connection to the existing system should be done to the future 315 mm Ø pipeline situated along the northern boundary of Farm 217/99.

The development is inside the sewer priority area.

2.2 Sewer flow

The original sewer analysis for the master plan did not take into consideration additional sewer flows resulting from the development on Erf 219/RE.

The potential Peak Daily Dry Weather Flow (PDDWF) for the proposed development on Farm 219/RE was calculated as 269 kL/d.

2.3 Present situation

2.3.1 Gravity sewers

There is insufficient capacity in the Hartenbos WWTP drainage area to accommodate the proposed development on Farm 219/RE, together with the potential "Mystic Views" development on Erf 6483 and "New Vintage" development on Farm 217/99. Upgrading of the bulk sewer system, upstream of the Hartenbos WWTP and downstream of the proposed connection of Farm 219/RE to the existing system, will be required to accommodate the proposed development together with other future development areas in the vicinity, in the existing sewer system, as shown in Figure 2 attached.

Bulk sewer upgrades:

•	HART-1.2: 925 m x 355 mm Ø Upgrade main outfall sewer	=	R 4 310 000 *
•	Item 1 : 300 m x 355 mm Ø New outfall sewer	=	R 1 525 000 *
•	Item 2 : 10 m x 250 mm Ø Re-route portion of existing Monte Christo drainage area	=	R 215 000 *
•	Item 3 : 615 m x 315 mm Ø New outfall sewer	=	R 2 610 000 *
	Total	=	R 8 660 000 *

(* Including P & G, Contingencies and Fees, but excluding VAT – year 2025/26 Rand Value. This is only a rough estimate, which does not include major unforeseen costs.)

The routes of the proposed pipelines (HART-1.2, Item 1, Item 2 & Item 3) are schematically shown in Figure 2 but must be finalised after detail pipeline route investigations.

Provision should be made for a 3 m pipeline servitude (in favour of the Mossel Bay Municipality) to accommodate sewer master plan items which runs over private property.

2.3.2 Pumping stations and rising mains

There is currently no infrastructure between the proposed development and the future 315 mm Ø outfall sewer which is planned to run along the northern boundary of Farm 217/99.

Link services items 4 & 5 (Private PS and accompanying rising main for proposed development on Farm 219/RE) will be required to connect the internal sewer system for the development (on the southern side of Farm 219/RE) to the future 315 mm Ø outfall sewer (item 3) which is planned to run along the northern boundary of Farm 217/99.

The route and location of the proposed private PS and rising main (link services items 4 & 6) are schematically shown in Figure 2 but must be finalised after a detailed pipeline route and pump station location investigation.

2.4 *Wastewater Treatment Plant*

According to the Regional WWTP and Process Audit (October 2023) the capacity of the Hartenbos WWTP is 17,8 ML/d. The maximum raw sewage inflow for Regional WWTP from 2022 to 2023 was approximately 15,0 ML/d.

There is sufficient spare capacity available at the Hartenbos WWTP to accommodate the proposed development.

2.5 *Minimum requirements*

The minimum requirements to accommodate the proposed development on Farm 219/RE in the existing sewer system are master plan items HART-1.2, item 1, item 2 and item 3. Link services items 4 and 5 will be required to connect the proposed development to the future gravity sewer which is planned to run along the northern boundary of Farm 217/99, as shown in Figure 2.

3 CONCLUSION

The developer for the Farm 219/RE development in Mossel Bay may be liable for the payment of a Development Contribution (as calculated by the Mossel Bay Municipality) for bulk water and sewer infrastructure as per Council Policy.

There is sufficient capacity in the water reticulation systems to accommodate the proposed development. However, due to the high static and dynamic pressures that could be experienced in the Vaale Valley reservoir zone, it is proposed that pressure management is implemented privately for development on Farm 219/RE.

There is insufficient spare capacity available in the existing Hartenbos WWTP sewer system to accommodate the proposed development. The implementation of master plan items HART-1.2, item 1, item 2 and item 3 is required to accommodate the proposed development in the existing Hartenbos WWTP drainage area. Link services items 4 and 5 are required to connect the proposed development to the future gravity sewer which is planned to run along the northern boundary of Farm 217/99, as shown in Figure 2.

We trust you find this of value.

Yours sincerely,

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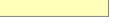


Per: PC DU PLESSIS

cc. The Manager: Civil Engineering Services
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Attention: Mr Eric Louw

Legend

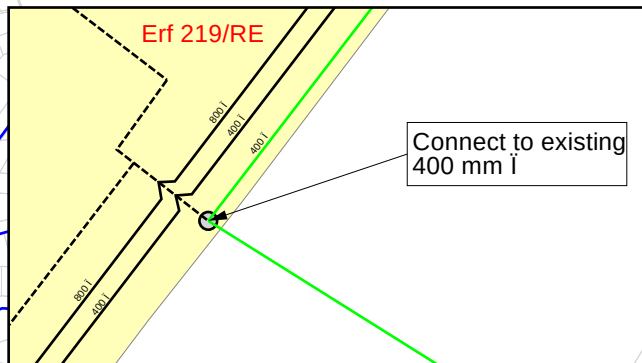
-  Existing bulk pipes
-  Existing Vaale Valley reservoir zone
-  Hartland 1 private pipelines (Schematic)
-  Schematic pipes
-  Existing reservoir
-  Existing pump station
-  Proposed development



Vaale Valley
reservoir
7 000 kL
TWL = 155.7m

Vaale Valley
PS

Detail 1:



Proposed
development

Detail 1:

Erf 219/RE

Legend

- Existing sewer system
- - - Existing rising main
- - - Private rising main
- Private pumping station
- Master plan items
- Existing pumping station
- Existing WWTP
- Sewer manhole
- - - Schematic pipes
- Proposed development
- Other potential future developments



Detail 2:

