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PRETORIA Our ref: **PM922_L01(HT).docx**
28 January 2020

Hunter Theron Town Planners
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ATTENTION: CHRIS THERON (chris@huntertheron.co.za)

PROPOSED DEVELOPMENT OF MARIKANA Ext 14 (ROOIKOPPIES 297-JQ): DESKTOP BULK SERVICES INVESTIGATION

Your request to investigate the services availability for the above proposed township refers.

A desktop study was conducted to formulate an opinion on the availability of bulk water and sewer infrastructure for the proposed township. We had meetings and/or contact with officials from the Rustenburg Local Municipality (RLM), Rand Water (RW) as well as mine officials. The services information is not readily available or supported with up-to-date drawings.

The concept development framework plan for Marikana x14 stipulates the residential potential to be 2553 units, comprising of 1163 RDP units and 1390 Bonded units. The following conclusions on the availability of bulk infrastructure:

(a) Bulk Water

The water demand for 2,553 erven is:

- 1,79 Mℓ per day average demand @ 700 liters per unit per day.
- Storage capacity required is approx. 2,0 Mℓ for 24-hour storage.

An old master plan, dated 2007, was obtained from the RLM which was compiled by the Rustenburg Consulting Consortium and the lead consultant was Messrs Bigen Africa. Annexure 1 shows an extract from the drawing.

A bulk water master plan was also obtained from Rand Water's Corporate GIS (*September 2019 gis-proj_24 WUEI Rustenburg_SN*) which shows the RW infrastructure in the Marikana region. Further liaison was with RW's Boitumelo Maifadi and an email is attached as Annexure 4.

In accordance with the available information and stakeholder liaison we comment as follow:



- The bulk water supplier is Rand Water. The nearest connection is approximately 5km from the site as indicated on Annexure 2.
- RW stated by e-mail that Rand Water has reached the maximum allowable abstraction volume from the Vaal System i.e. there is no bulk water available currently.
- The existing infrastructure comprises a 500mm \varnothing water main near the proposed development on the western side of the Sterkstroom. The connection is $\pm 0,9$ km from the proposed development.
- The RW connection supplies 3 reservoirs located $\pm 1,5$ km from the site with 3M ℓ with top water level (TWL) 1207.57 m ,1 M ℓ and 3M ℓ with TWL of 1224.4 m.
- The RW official stated that alternate water sources be investigated i.e. boreholes.
- The RLM is currently imposing water restrictions.

In summary

- (i) There is currently no bulk water for the proposed township.
- (ii) It remains unclear if any bulk water pipeline upgrades are planned in the area.
- (iii) It is noted that a geo-hydrologist's further investigation is required to comment on the feasibility for supply from boreholes. We believe boreholes may also not be a viable option due to demand and also the mine dewatering in the area which may limit extraction.
- (iv) Should bulk water be available then a new reservoir is required – minimum 2MI in size. The bulk / reticulation bulk mains required could be in excess of 5km length of 400mm \varnothing .
- (v) Water Use License Application (WULA) may be required for the pipe river crossing.

(b) Sewer

The sewage flow for the 2,553 erven are $\pm 1,5$ M ℓ per day average flow.

No sewer master plan information could be obtained for the development area. A site investigation and aerial photographs desktop study was done and

- No sewage treatment or outfall sewer infrastructure is available in close proximity to the proposed development.
- The nearest Wastewater Treatment Plant (WWTP) identified is located at Wonderkop, ± 5 km from proposed development. The capacity could not be confirmed but its likely that the capacity will need to be increased.
- We liaised with a specialist who advised that:
 - Package plants are normally a standard design up to 0.5 MI/day after which the same module can be duplicated. A plant of 1.5 MI/day is not considered to be a package plant.
 - A new 2MI/day extended aeration activated sludge plant, with biological nutrient removal with the terrain development will cost between R30 to R35 milj.
 - The same plant with nitrogen removal (important for energy saving) but not with phosphorus removal will cost \pm R 26 milj.
 - The treatment is an expensive element which may affect the project feasibility.

In summary

With the information available we comment as follows:

- (i) No bulk sewer infrastructure available.
- (ii) A new plant to be built for an expected cost of up to R30million.
- (iii) Upgrading of existing plants to be investigated but the cost of the outfall sewer and plant will probable exceed the cost of a new plant.
- (iv) Further investigations are required.

From our dealings with stakeholders it seems that the RLM does not have knowledge of the project or does not support it. The bulk infrastructure in the area is very much undocumented and planning will have to be for the proposed developed as well as the surrounding area. For this the council buy-in to be obtained by the developer and dedicated communication channels established.

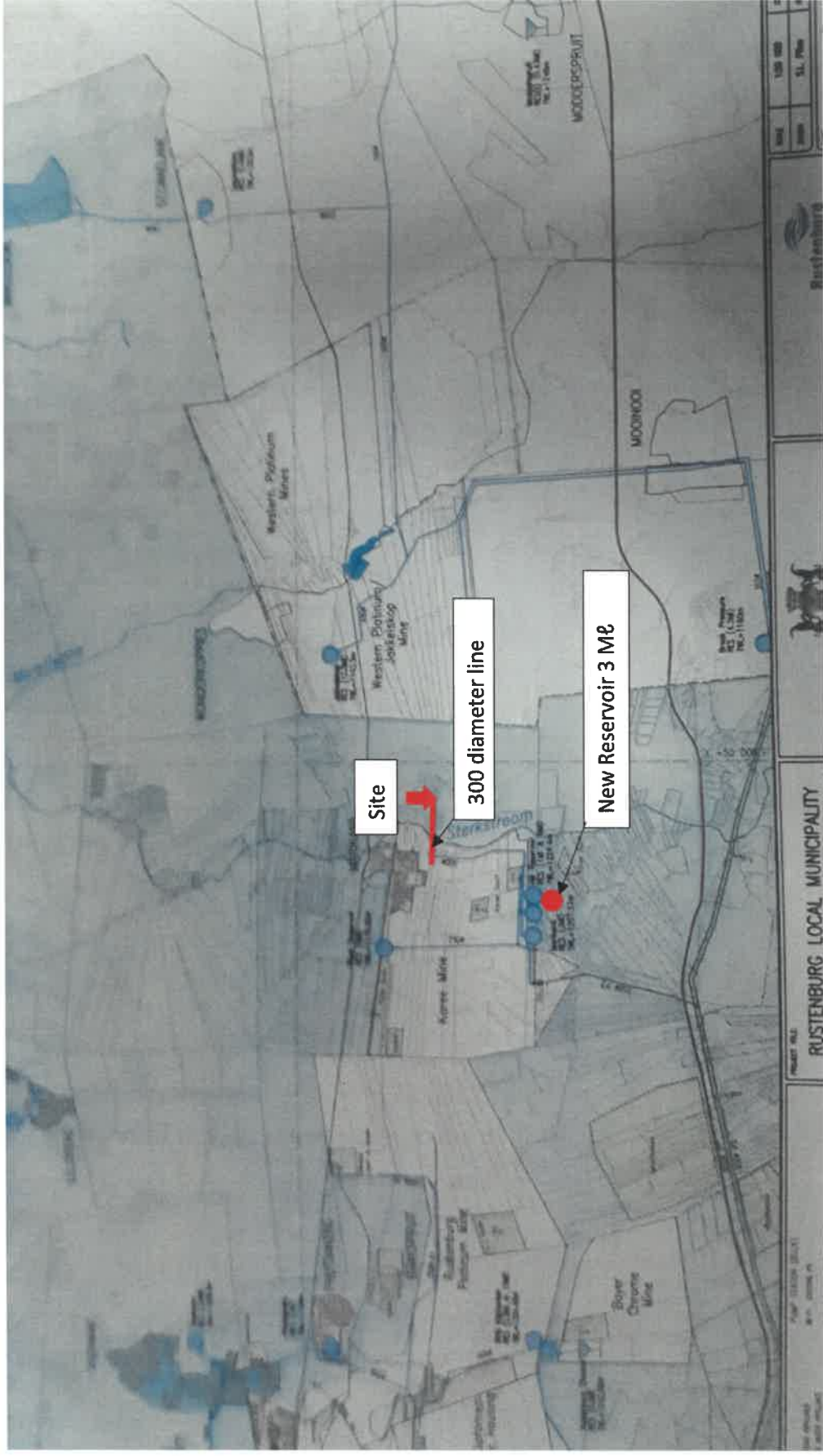
We trust you will find the above in order. Please contact the writer for any further information.

Yours sincerely

HLANGANANI CONSULTING ENGINEERS



B.J. DREYER Pr Eng
DIRECTOR



Annexure 1- Master plan of the bulk water infrastructure



Annexure 2 – Shows the approximate diagram of existing system and the proposed new pipe link with river crossing



Annexure 3 – The Waste water treatment plant

