

Method Statement for Abstraction, Treatment, Use and Discharge of Water from the uMhlathuzana River

- The feed water from the river will be pumped through basket strainers, which will remove larger suspended solids from the feed and filter the water down to 2 mm.
- From the strainers, the feed will be dosed with a suitable oxidant and proceed to the settling tank, which also allows for settling of heavy suspended solids like sand. This is especially important during flooding conditions in the river.
- The settling tank overflow will be dosed with coagulant to destabilize and neutralize the charged particles in the water, allowing for floc formation, which will aid in achieving more effective settling. The coagulated feed will then proceed to the rapid mixing tank, to ensure adequate chemical mixing. The overflow from the rapid mixing tank will be dosed with flocculant which will ensure that the flocs formed by coagulation, will agglomerate. This further enhances the settling efficiency of the suspended solids. The coagulated and flocculated feed will then proceed to the slow mixing tank, which will allow for enough retention time to ensure proper floc formation and distribution, as well as gentle agitation as to not break the forming flocs.
- From the mixing tanks the feed will proceed to the DAF for the removal of mainly algae, and some particulate COD and suspended solids.
- The DAF overflow will proceed to the clarified water tank, from where the water will be pumped to the media filters, for final removal of residual suspended solids.
- At this point the water will be close to potable standard, but due to the detectable amounts of untreated sewage in the water, there is a risk of micro pollutants in the water that can have adverse effects on human health. These micro pollutants (also known as Compounds of Emerging Concern, CECs) include hormones, pharmaceuticals, pesticides, herbicides, etc. and is notoriously difficult to remove from water, a UV-Hypochlorite Advanced Oxidation Reactors (AORs) will be specifically designed for this application.
- The Advance Oxidation Reactors (AOR) final product will be stored in the product tank and be continuously disinfected by the in-tank UV, for further distribution and use.
- All plant waste, including backwash, DAF Sludge and DAF scum will be sent to Clover's effluent treatment plant.
- All process pumps will be duty-standby for redundancy and in order to limit plant down-time. Allowance was made for automated MF backwash and will be timer-based or triggered via a pressure differential. Allowance was also made for automated desludging of the DAF, which will be timer-based.
- Apart from the apparent benefit of 24/7 monitoring and response, the system will also be able to provide the Clover with routine automated reports on water and chemical usage of the system.



Figure 1 Location of plant and abstraction point