

BRADWELL SITE

PUMPING ARRANGEMENT FOR THE MAIN DRAINS PIT (ME A3 OT10)

BRAD/EN/REP/201

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## 1. Purpose

This document is in response to the Environment Agency's request to provide an operating technique to meet condition 2.3 "A3 OT10 (*Pumping arrangement for the Main Drains Pit (MDP)*)" for the Mixed Effluent permit PR2TS/E10760C<sup>1</sup>. This operating technique outlines the pumping arrangements for the discharge of the mixed effluents from the MDP and provides a description consistent with that provided in the environmental risk assessment BRAD/EN/REP/108<sup>2</sup>.

## 2. Volume of Discharge Effluent Measurement

The non-radioactive effluent collected in the MDP consists of approximately 30 m<sup>3</sup>/day of treated sewage effluent (detailed in BRAD/EN/REP/197<sup>3</sup>), trade effluent from the reverse osmosis plant, rainwater, site surface run-off and occasionally 20 m<sup>3</sup>/day of treated voids water (detailed in BRAD/EN/REP/199<sup>4</sup>).

The MDP has four pumps each rated at 1091 m<sup>3</sup>/hr. Two of the main drains pumps are set as "duty pumps" with two pumps on standby. Generally, only one of the four pumps operates dependant on rainfall. The requirement for four pumps is to provide backup pumping capacity in case of heavy rainfall or in an extreme weather 1 in 100 years' event. Standby capability during times of maintenance or breakdown is also provided by the availability of four pumps.

The operation of the pumps is generally automatic. However, during the treated voids' effluent discharge via the siltbuster, the pumps are operated in a manual mode. This ensures that 130m<sup>3</sup> of the mixed effluent is available and that the voids' effluent receives the 6.5:1 dilution as specified within the environmental risk assessment.

At other times, the pumps are set to automatic mode and the A3 effluent discharge limit within the permit is 50,000 m<sup>3</sup>/day. However, history over the past 11 years shows that discharges have averaged at 109m<sup>3</sup>/day based on any of the four pumps running for a total of 100 hours (1091m<sup>3</sup> per hour x 4 x 100 / 11 / 365). Only two of the pumps have ever been required to be used concurrently for short periods. From this past experience, the limit of 50,000m<sup>3</sup>/day is more than sufficient for the site.

The automatic pumping is controlled by an ultrasonic system with measuring heads positioned over the MDP. This controls the pumps at the following levels:

- 300mm pumps stop
- 1200mm 1st duty pump starts
- 1500mm 2nd duty pump starts
- 1800mm 3rd and 4th standby pumps start
- All 4 pumps run until 300mm level is achieved and system resets.

There is also a stand-alone high level alarm probe within the MDP that alarms to the Site Monitoring Facility.

## REFERENCES

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- 1 Environment Agency 2016. Mixed Effluent Permit Number PR2TS/E10760C
- 2 BRAD/EN/REP/108 2015. Environmental Risk Assessment for Aqueous Effluent
- 3 BRAD/EN/REP/197 2016. Sewage Treatment Plant Maximum Capacity (Mixed Effluent A3 OT7)
- 4 BRAD/EN/REP/199 2016. Siltbuster Capacity (Mixed Effluent A3 OT6)