# VALIDATION TEST CERTIFICATION

## Atlantium Technologies Ltd. RZ104 Series UV System

HDR/HydroQual conducted all testing, sampling and analysis, data analysis and documentation, and prepared this final report which compiles the results of validation tests and presents the validated performance summary for the subject systems. The calculation of the validation factor for credited RED and log inactivation is following the guidance of the EPA Ultraviolet Disinfection Guidance Manual (UVDGM). The two RZ104 models were validated over a range of flow rates, feed water UV transmittances, and lamp power levels. These operating parameters cover a wide range of doses for challenge organism surrogates (MS2, QB, and T1UV) at UV doses that show reductions between 8.7 and 161.0 mJ/cm2.

Testing defined the operating envelope for disinfection credits under the Long-Term Enhanced Surface Water Treatment Rule (LT2). For the RZ104-11 Model, this is between 10 GPM and 605 GPM, and UV Transmittance values ranging from 77.9% to 97.3%, and power ratings between 40%-100% For the RZ104-12 Model, this is between 16 GPM and 601 GPM, and UV Transmittance values ranging from 77.9% to 97.3%, and power ratings between 40%-100%

In addition, validation biodosimetry using a live strain of Adenovirus 2 was conducted on the RZ104 model reactor. The test results demonstrate that the UV reactor is able to accomplish 4 log (99.99%) virus inactivation as required by the UVDGM Dose Requirements Table 1-4. The Adenovirus validation is restricted to flow rates between 44 GPM to 248 GPM, UV Transmittance Values 85.3% and higher, and power levels between 40% and 100%.