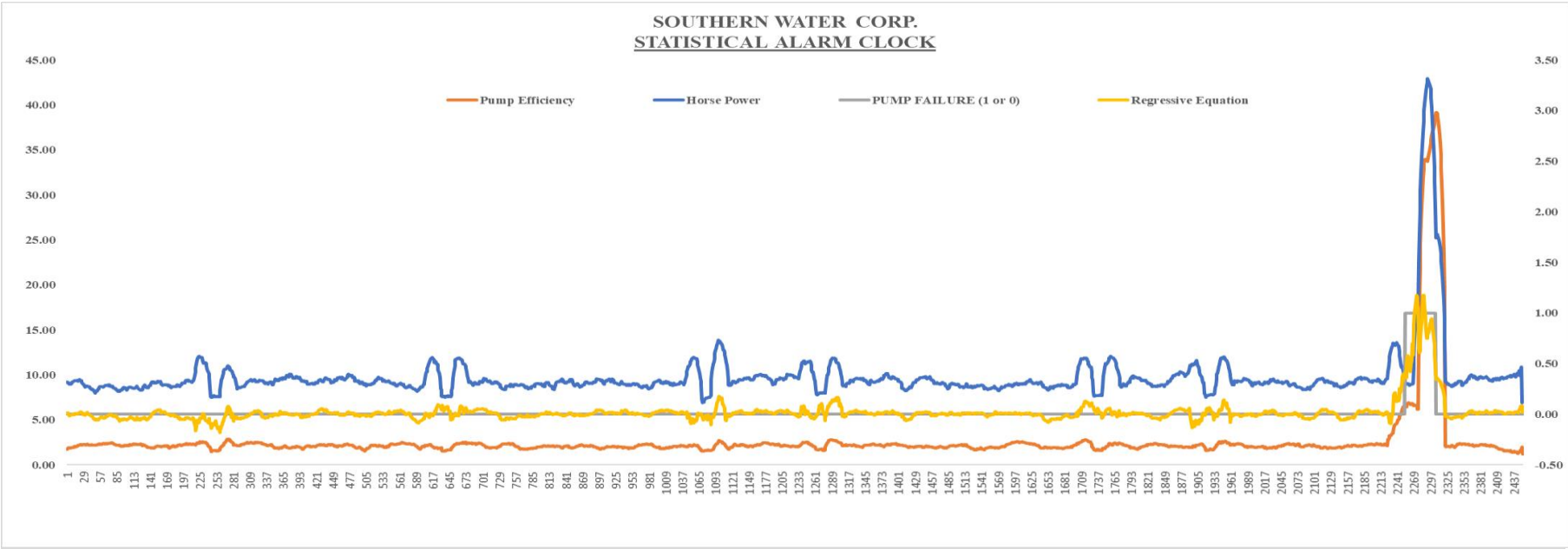
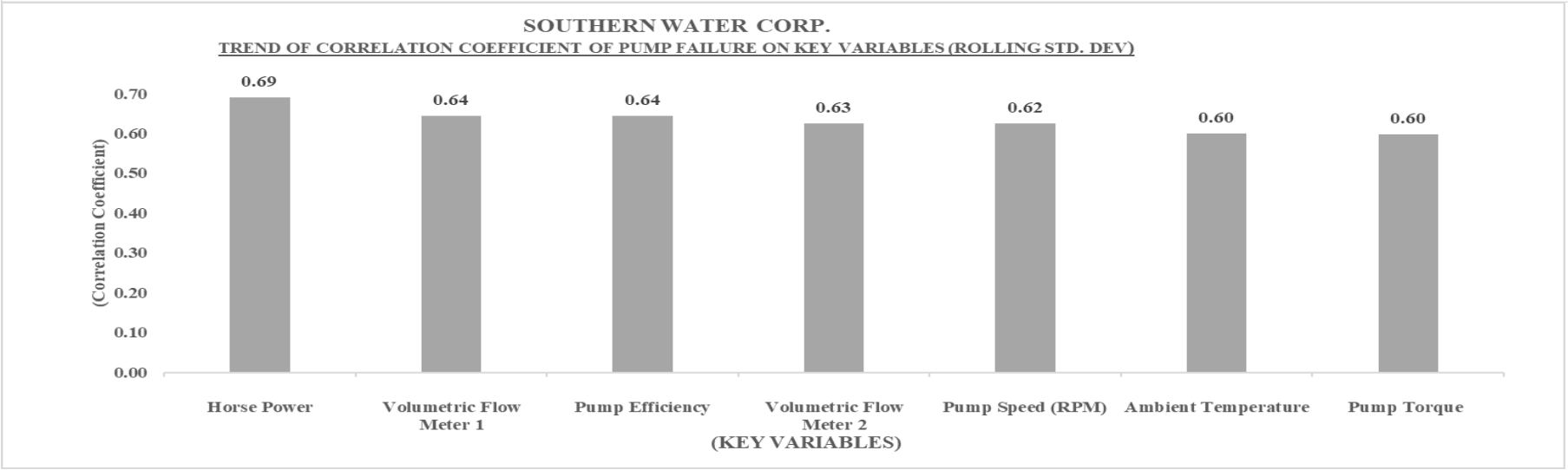
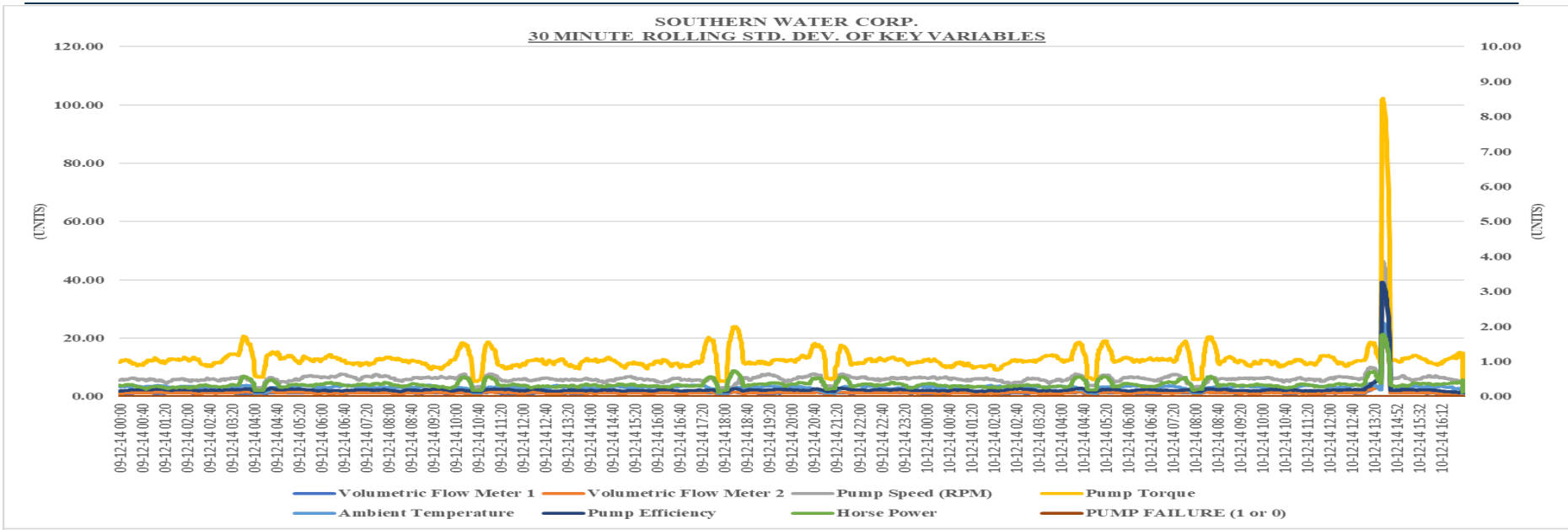
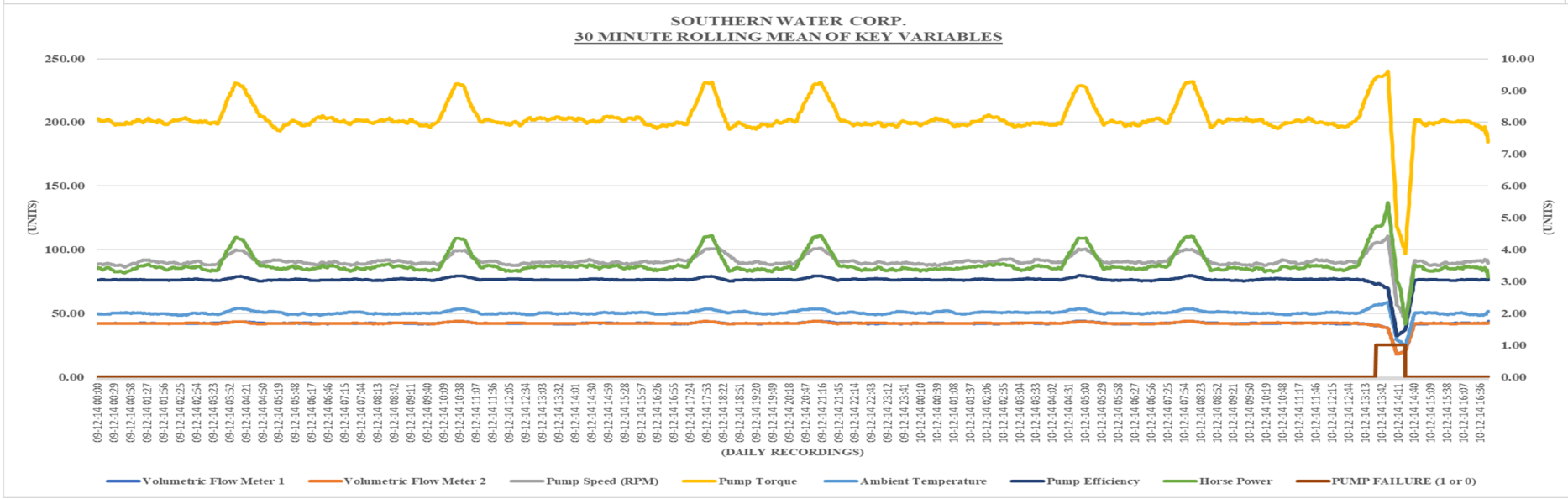
**Descriptive and inferential statistical methodologies have proven effective in creating a proactive 'alarm', accurately identifying Pump Failures with Horse Power (HP) and Pump Efficiency (PE) emerging as key variables of interest with deviations of 15 HP and > 3 % PE being our core signal thresholds.**



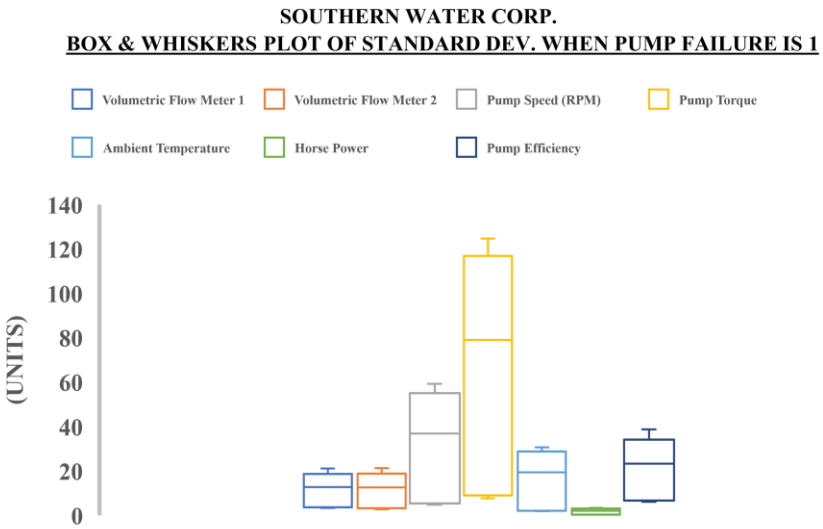



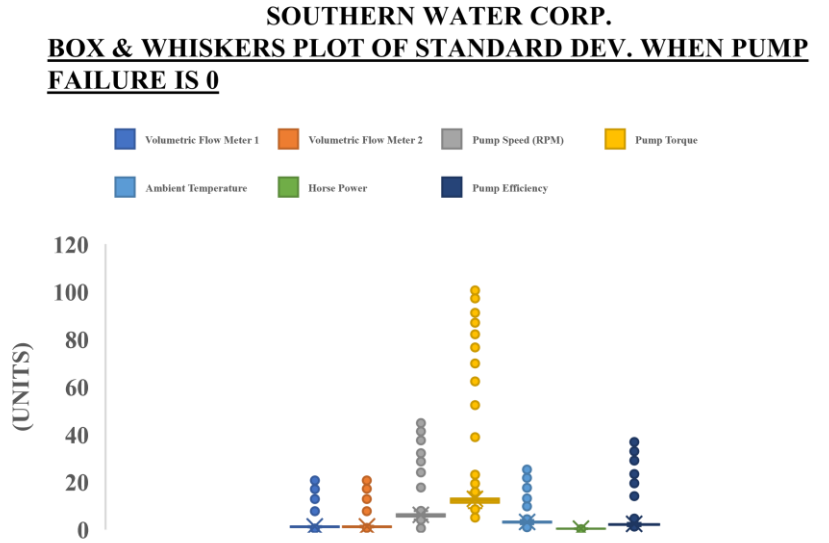
**Descriptive Analysis has enabled us to clearly identify particular signature abnormalities showing clear signature changes in both Rolling Standard Deviation and Rolling Mean Datasets when observed over the respective failure period of interest.**

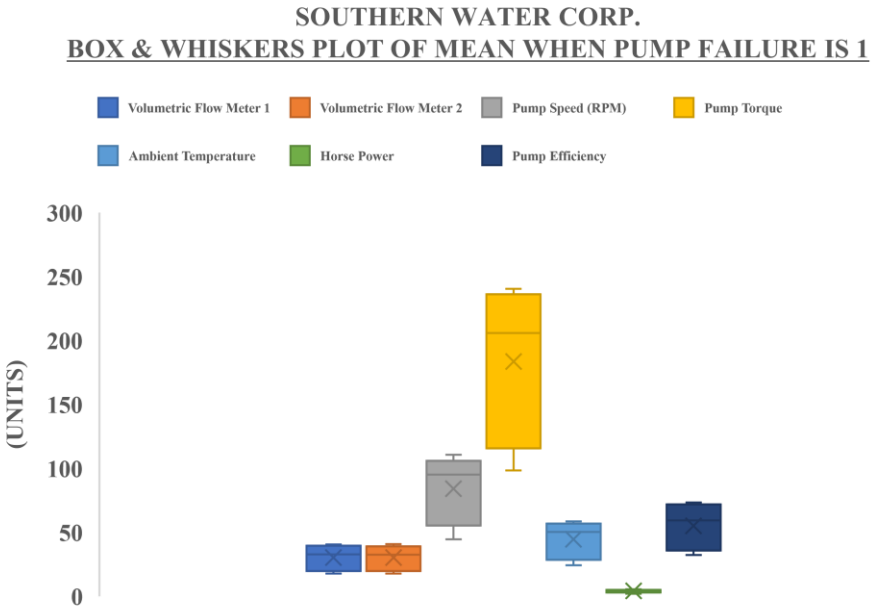


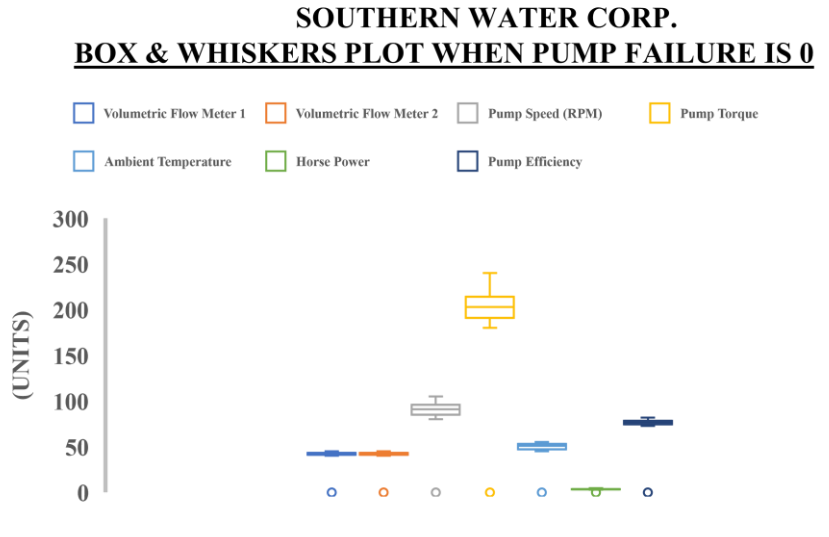



**Further segmentation of the data via binary means (Pump Failure = 0 or 1) illustrated through box and whiskers plots, show a clear signature difference between that of normal behaviour and that of Failure with *Pump torque*, *pump speed* and *pump efficiency* showing the 3 largest variances.**

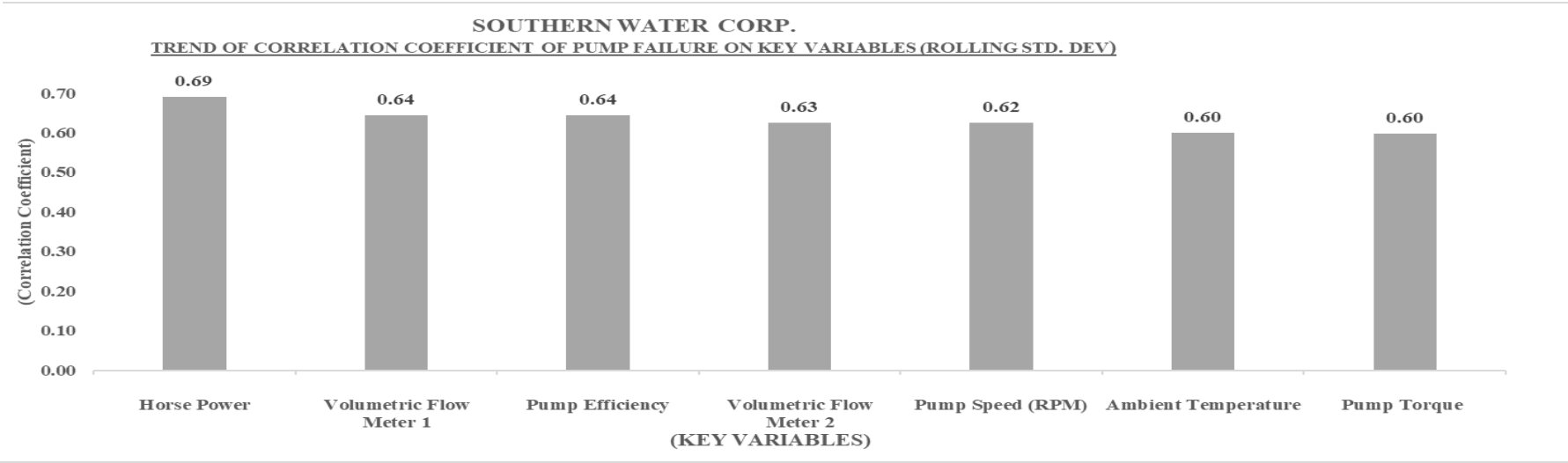


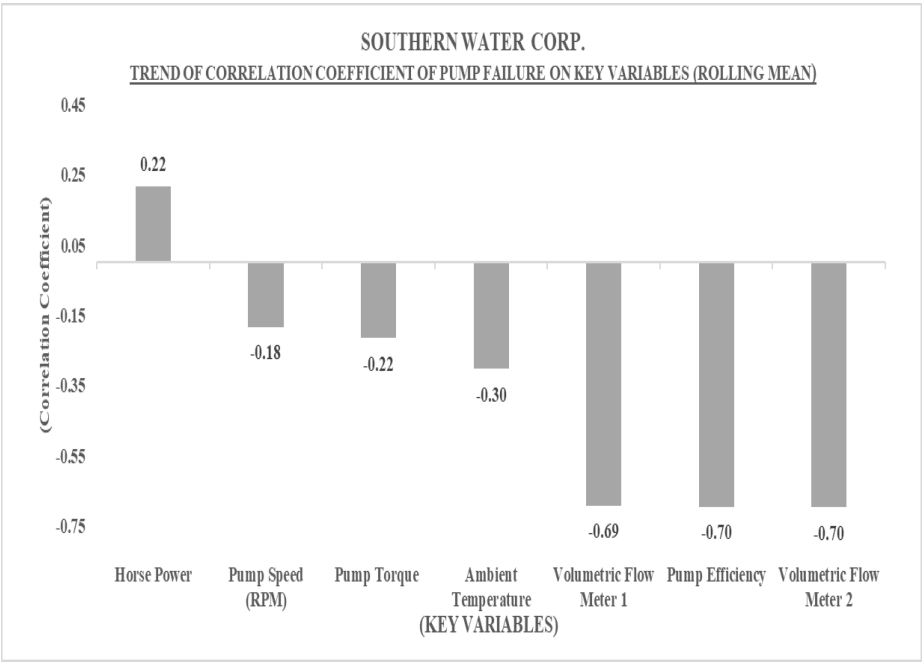



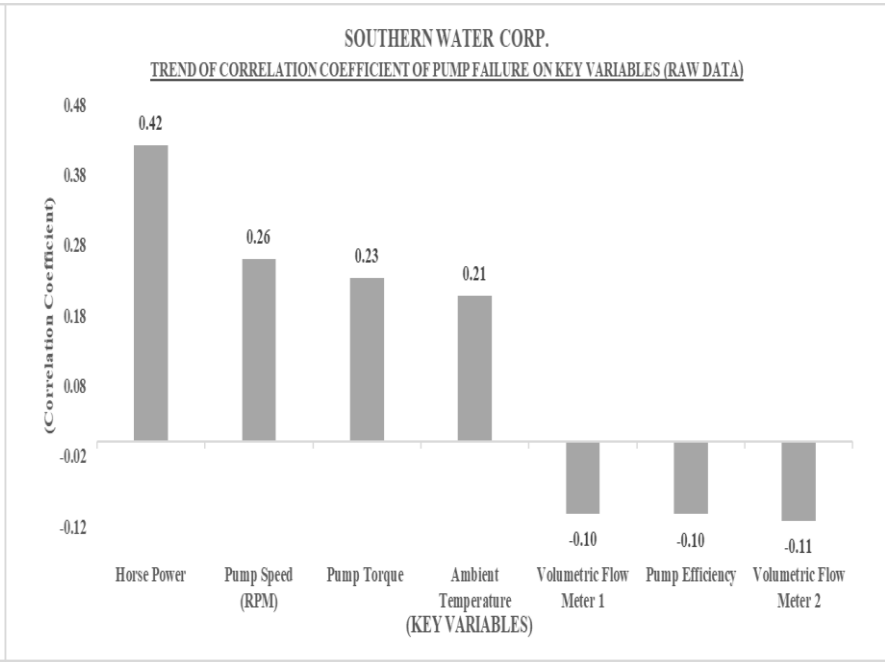



**Correlation analyses across datasets yield interesting insights with *pump speed*, *pump torque* and *ambient temperature* negatively correlated with Pump Failure in the Rolling Mean Data, whilst *Volumetric flow 1 & 2* and *pump efficiency* show a subsequently strong negative correlation in the *Rolling Mean Dataset*.**



**Lastly, analysis of the model fit reveals that with a R Squared of *78%*, a linear model is a *good fit or "acceptable"* for the data with *variables Horse power, Volumetric flow meter 2 and Pump efficiency* having the largest *absolute coefficients*, indicative that these variables have the most immediate relationship with respect to Pump Failure behaviour.**