Investigating leachate contamination near the Quezon City Controlled Dumpling Facility using ion chloride as indicator

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Abstrak

The Quezon City Controlled Dumping Facility (QCCDF) has been the ‘main disposal site of Quezon City, the largest city within Metro Manila since the 1970s. With the huge volume of wastes received every day and with no protective liner on the old mound and creeks directly connecting the facility to Marikina River, the main river system in eastern Metro Manila, surface and groundwater contaminations have been a critical concern. The main objective of the study is to determine the effect of the disposal site on the surface water and groundwater quality by evaluating the water quality at different points in and around the landfill. Secondarily, it aims to investigate correlations between the water quality parameters as well as determine any seasonal effects on the water quality. Sampling points from wells on and around the facility were collected for six months covering dry and wet season using Horiba water quality monitoring equipment and CHEMetrics V-2000 Photometer. Leachate quality parameters pH, turbidity, DO, and chloride are not affected by the change in seasons as evidenced by statistical t-tests. Temperature is higher during the wet season, while TDS is lower at this time which may be attributed to dilution due to rainfall. DO and turbidity in leachate is strongly negatively correlated, while temperature and C1‘ in leachate are positively correlated. In groundwater, the change in season affects temperature, TDS and chloride concentrations. This trend is not evidenced in pH and turbidity. TDS and chloride are correlated with each other. Based on the surface water quality measurements, temperature, pH, DO, and TDS are affected by the change in season while turbidity and chloride are not, based on the comparison of samples taken from different locations. Aside from strong correlation of Cl’ and TDS, as seen in groundwater, very strong correlations are also observed between Cl’ and DO, and TDS and DO. Using chloride ion as indicator of leachate, the study reveals that the leachate tends to spread downward towards Marikina River. Based on the comparison of chloride concentrations near the outfall of the leachate creek at Marikina River, it can be seen that the release of leachate at the river impacts the river as evidenced by an increase in chloride concentration downstream of the outfall.