Gross Alpha and Gross Beta Radioactivity and Heavy Metal Concentration Profiles of Well Water of the Calahunan Dump Site, Mandurriao, Iloilo City

A special problem presented to the
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ABSTRACT

The study aimed to establish presence of radioactivity and concentration of heavy metals specifically lead and chromium in drinking water from wells within one-kilometer radius from the approximated center of the Calahunan dump site. Results showed that four out of twelve wells have positive results fro gross alpha activity and gross beta activity: wells 2A, 2C, 3A, and 3D. Well 2A, 2C and 3D registered alpha activities of 0.54, 0.033 and 0.369 Bq/L respectively while Well 3A registered beta activity of 1.0 Bq/L. Wells 2A and 3D exceeded the radiological limits set by WHO and PNSDW of 0.1 Bq/L for alpha activity and 1.0 Bq/L for beta activity. These wells that are found adjacent to the perimeter fence of the dump site registered alpha activity (wells 2A, 2C and 3D) and beta activity (well 3A). Radiological activities in all other wells sampled registered less than lower limit of detection. For gamma activity, all wells recorded 137-Cs and 134-Cs activity less than the lower limit of detection. For chromium and lead concentration using FAAS, only well 3C has a chromium concentration of 0.0952 ppm and this exceeded the PNSDW standard for chromium in drinking water (0.05 ppm). FAAS has not recorded any value for lead. For chemical constituent analysis using XRF, two wells in zone 1 (IA and IC), have recorded lead concentration of 0.9 and 0.136 ppm, respectively. In zone two, only well 2D registered a lead concentration of 0.248 ppm. In zone 3, well 3C registered a lead concentration of 0.397 ppm. For chromium concentration, only well 2A in zone 2 has a chromium concentration of 1.79 ppm. The spot interview and ocular inspection found out that the following garbage are disposed of indiscriminately in the dump site: (1) Television picture tubes, (2) Dysfunctional Computer Monitors, (3) Used syringes and needles, (4) Hospital wastes, (5) Automobile batteries and dry cells, (6) scrap iron, tin cans, paint cans, paint cans, etc., (7) polyethylene bottle, glass bottles, and containers of similar types, and (8) other organic and inorganic wastes. Wells whose values for gross alpha, lead, and chromium concentration exceeded the standard are unsuitable for dinking and other domestic uses. The observation that wells (2A and 3D) near the Calahunan dump site registered higher-than-standard alpha activity may be a good basis to conduct further research particularly on the effect of leachate from dump site.