

IMPACT OF 2010 MERAPI VOLCANIC ASH ERUPTION IN INDONESIA FOR WATER SUPPLIES

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The 2010 eruptions of Merapi Volcano in Indonesia, began in late October 2010 when Merapi Volcano in Central Java, Indonesia began an increasingly violent series of eruptions that continued into November. Beside respiratory health effect to human health, volcanic ash may result in short-term physical and chemical changes in water quality. The addition of volcanic ash to water supplies can lead to a change in water quality. The most common ash-contamination problems result from a change in turbidity and acidity, but these usually last a few hours to a few days unless the ash fall occurs for prolonged periods of time. For longer period, the effect of pyroclastic flow was also suspected to effect of surface water, in fact the material of pyroclastic flow consist of fresh volcanic material which can carry a variety of metals and other potentially-pathogenic trace elements. In this study, thirty water samples were obtained from several water supplies including groundwater, surface water, waterworks company, and spring, which collected on the day after eruption. The result showed that some of some water samples has been contaminated by volcanic ash. Some parameters including Total Suspended Solid, Color, pH, Iron, Mangan, Nitrate, Lead, Cadmium, Selenium were detected above the threshold. Especially for Selenium, it was considered high and the source of selenium was considered from sulfur composition in volcanic ash sample. On the other hand, the impact of pyroclastic flow for water supplies has been carried out, by sampling five location of surface water in two month after eruption. Water quality data obtained from several rivers in study area indicated Iron, pH, turbidity and Total Suspended Solid were above the threshold. In particular, the suspension of ash in water can block intake filters and cause wear and tear on components of water treatment plants due to its abrasive and corrosive nature. High turbidity levels can compromise the effectiveness of disinfection of pathogenic microorganisms. Other effects are high water demand for cleanup depleting water storage in reservoirs, and the leaching of soluble components, particularly acidity, into receiving waters.

Keywords: volcanic ash, water supplies