

Title: Groundwater Impact Analysis from the 2006 Eruption of the LUSI Mud Volcano, Java, Indonesia

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On May 26th, 2006, a mud volcano was triggered in East Java, Indonesia, from a combination of improper drilling procedures and possibly the Yogyakarta earthquake. This mud volcano, commonly referred to as “LUSI” (‘LU’ for Lumpur and ‘SI’ for Sidoarjo, or ‘Mud of Sidoarjo’), has had a severe impact on the aquifer of the area which supplies tap water to over 100,000 people within a few miles from the main volcanic vent. LUSI continues to erupt daily with no signs of stopping in the next 25 years. Water samples were collected from all types of water sources in the area, including river, volcanic lake, house faucets, as well as public institutions such as schools and mosques. Preliminary in-field tests showed many domestic water sources contained conductivities above 3,999 and more than 2,000ppm. Concentrations of Calcium, Sodium, Chloride, and Iron from these local wells and faucets were found to be at levels unsafe for human consumption. In addition to the influence of the mud and gases introduced from the main vent, subsidence has also impacted the groundwater with unusually high concentrations of Benzene and TOC, which can be attributed to the submergence of 25 factories and an unknown amount of petroleum stations within the 7 km long levee, including a gas pipe explosion that killed 14 people. Most efforts in the area up to this point have been focused on who is to blame for the eruption. This report concentrates more on the effects of the water supply and its long-term impact on the health of the people who consume water from these sources. By linking science and public health, this study helps provide insight into what are the concerns and point to likely ways to more closely define the risk to the population and environment.