Reassessment of land condition of liquefied sites caused by the 2011 Tohoku earthquake and liquefaction potential

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A large number of sand boils caused by the 2011 Tohoku earthquake were observed at the refilled lot of gravel pits in the Kinu, Kokai, Naka and Kuji River basins, eastern part of Kanto region and Shiroishi, Naruse and Eai River basins, Miyagi Prefecture. Land condition (geomorphological condition) of these liquefied sites were considered as back marsh and former river channels by the previous studies and reports. These refilled gravel pits were mostly developed and buried by borrow materials since the latter half of 1970's.
Many gravel pits were identified in the middle and lower reach of Tama River since 1940's by using the aerial photos and old edition maps. These gravel pits were refilled before 1970's, and changed to the residential area, industrial site and parkland. In the alluvial plains of Japan, many gravel pits were developed and refilled in the past. Because of the duration of these gravel pits were short (only a few years), the detection of existence of gravel pits is difficult, and existence of gavels pits does not represent to the land condition map. Therefore, a number of areas with a high potential for liquefaction may have not detected in many alluvial plains.

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