Environmental pressure from the 2014–15 eruption of Bárðarbunga volcano, Iceland

S. R. GÍSLASON[1*], G. STEFÁNSDÓTTIR[2], M. A. PFEFFER[2], S. BARSOTTI[2], TH. JÓHANNSSON[3], I. GALECZKA[1], E. BALI[1], O. SIGMARSSON[14], A. STEFÁNSSON[1], N. S. KELLER[1], Á. SIGURDSSON[2], B. BERGSSON[25], B. GALLE[6], V. C. JACOBO[6], S. ARELLANO[6], A. AIUPPA[5], E. S. EIRÍKSDÓTTIR[1], S. JAKOBSSON[1], G. H. GUÐFINNSSON[1], S. A. HALLDÓRSSON[1], H. GUNNARSSON[1], B. HADDADI[4], I. JÓNSDÓTTIR[1], TH. THORDARSON[1], M. RIISHUUS[1], TH. HÖGNADÓTTIR[1], T. DÜRIG[1], G. B. M. PEDERSEN[1], Á. HÖSKULDSSON[1] AND M. T. GUDMUNDSSON[1]

[1]Nordvulk, Institute of Earth Sciences, University of Iceland, Sturlugata 7, 101 Reykjavík, Iceland *sigrg@hi.is, img3@hi.is, eniko@hi.is, olgeir@hi.is, mtg@hi.is

[2]Icelandic Meteorological Office, Bústaðavegi 7-9, 108 Reykjavík, Iceland gerdur@vedur.is, melissa@vedur.is, sara@vedur.is

[3]Environment Agency of Iceland, Suðurlandsbraut 24, 108 Reykjavík, Iceland thorsteinnj@umhverfisstofnun.is

[4]Laboratoire Magmas et Volcans, Observatoire de Physique du Globe de Clermont-Ferrand, CNRS—Universite´ Blaise Pascal—IRD, 5 rue Kessler, 63038 Clermont-Ferrand Cedex, France

[5]Università di Palermo, 90123 Palermo, Italy alessandro.aiuppa@unipa.it

[6]Chalmers University of Technology, Department of Earth and Space Sciences, Hörsalsvägen 11, 412 96 Gothenburg, Sweden bo.galle@chalmers.se

The effusive Bárðarbunga eruption that began on 31 August 2014 is the largest in Iceland for more than 200 years, producing 1.5 km^3 of lava by January 21 during the first 144 days. The SO_2 emission during this time was 8.7–11.0 Mt, twice the amount emitted from the EU in 2011. Ground level concentration of SO_2 exceeded the hourly average health limit over much of Iceland for days to weeks. Anomalously high SO_2 concentrations were measured at several locations in Europe in September. The lowest pH of fresh snow–melt at the eruption site was 3.3 and 3.2 in precipitation far away from the source. Elevated dissolved H_2SO4, HCl, HF, and metal concentrations were measured in snow and precipitation. Environmental pressures from the eruption and impacts on populated areas were minimised by its remoteness, timing, and climate. The anticipated primary environmental pressure is on surface waters, soils, and vegetation of Iceland.