Geophysical Research Abstracts
Vol. 17, EGU2015-10229, 2015
EGU General Assembly 2015

Mercury and other metal(oid)s from mining activities in sediments from the Almadén district

Efrén García-Ordiales (1), José M Esbrí (2), Pablo Higueras (2), and Jorge Loredo (1)

(1) Universidad de Oviedo, Depto. Exploración y Explotación de Minas, ETSIMO, Oviedo, Spain, (2) Universidad Castilla-La Mancha, Instituto de Geología Aplicada, Almaden, Spain (pablo.higueras@uclm.es)

Almadén (South Central Spain) is worldwide famous because of mercury mining. But besides, the area has also been the site of other types of mining, in particular exploitation of Pb-Zn sulphides, with variable contents of other economic metals such as Ag, as well as others with high pollution potential such as As, Cd, Sb, etc. These exploitations were in activity in different historic periods, since Romans times to the 20th Century, and most of them were abandoned with no reclamation measures at all, acting as important sources of contamination in surrounding soils. In this work, we present a preliminary assessment of the affection of sediments for the streams of Almadén mine district, considering other potential pollutants in addition to mercury.

Sampling was carried out during the period 2010-2013, and involved the collection of 65 samples of stream sediments in the main river of the district (Valdeazogues River) and main subsidiaries. Samples were air-dried, sieved to <2mm to discard gravel fraction, milled to <63μm and analysed in certified laboratory (ACME Labs Canada) by ICP-AES and ICP-MS after hot acid digestion.

Results showed that sediments suffer a significant metal accumulation within the district, being specially concern at the areas close to mines. Most studied samples exceed the heavy metals and metalloids reference values for uncontaminated sites as well as those fitted to protect the aquatic life. Element by element, mercury contents are widely disperse in the district because of mining activities and it can be considered as the main pollutant of the district. Concentrations of other potentially harmful elements such as Pb, Zn and As show also important concentrations, which may be attributed to anthropogenic sources, specially to decommissioned mines. Comparing concentrations from the different surveyed areas, two different zones were identified: One located in the upper part of the district, where the intense mining activities related with four of the largest Hg mines produced an important Hg anomaly of regional scale, and with no significant concentrations of the rest of metal(oid)s. On the other hand, in the lower part of the district, together with the intense activity of the Almadén mine, other polymetallic mines causes Pb, Zn and As concentrations implying significant enrichments with respect to the upper area.