

Abstract Submission
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The Need for a Prioritised Contaminated Mine Sites Database

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Session Theme relevant to: Contaminated Site Investigation

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Overview. The “mineral extraction, refining, reprocessing, storage and use” HAIL category covers all coal and mineral extraction industries, including historic mine sites. There is a regulatory requirement that these sites appear on local government land-use registers. However, prioritization of resources and funding are required to effectively manage these sites. A ranked database will aid in identifying such sites, and with simple metrics, determine priorities for directing resources to sites that require urgent remediation. These sites may be a high priority for a variety of reasons: either the extent or type of contamination; the effects of downstream contamination away from the site; or, current / future land use.

Historic mine practices were not regulated and sites were often abandoned after mining with little or no rehabilitation. Tailings containing deleterious metals were disposed of into waterways or left on site. The types and concentrations of these contaminants will differ depending on the extraction techniques used. Assessing these sites requires knowledge of the geology of the rocks being processed and historic processing techniques used, as well as an understanding of the geochemical processes that occur to tailings and waste rock that can remain on sites for decades. Site conditions will determine the long-term geochemical stability of these residues.

- **Background/Objectives.** The objective is to develop a prioritised contaminated mine sites database that is assessed and ranked from an environmental geochemical perspective. It is proposed to initially concentrate on the West Coast region where there are numerous historic coal and gold sites on government conservation land, working with DOC and the WCRC. This region has recently successfully rehabilitated a number of historic sites (e.g. Prohibition Mill Site at Waiuta, Alexander processing site) and the database would direct resources to sites that required further field investigations and identify the next sites requiring rehabilitation.
- **Approach/Activities.** The database will be a desktop exercise that will direct future field investigation work into sites that are the highest priority. The database would collate information from a number of sources (e.g., GNS, WCRC, DOC) as well as using up-to-date Landsat images to identify contamination extents.
- **Results/Lessons Learned.** By initially concentrating on the West Coast region, lessons learned from compiling the data could then be applied to other regions within New Zealand. The database could then be passed on to the Ministry for the Environment’s “Contaminated Sites Remediation Fund Priority List” to apply for funding. The database could also be used to identify sites that may pose a safety risk and provide information on the cultural heritage, resources (reprocessing of tailings to extract a commodity) and biodiversity of a site.

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Speaker Biography

Kirstine is a geochemist working for O’Kane Consultants, an international mine closure services company. In 2016, Kirstine completed a Masters of Environmental Science on the Environmental Legacy of Historic Gold Processing in the Reefton Goldfield at the University of Otago. Previously she has worked as a geologist for over 10 years in the government, consultancy, exploration and mining sectors in Canada, Mongolia, Australia and New Zealand.