

**THIS ISSUE: GLOBAL NUCLEAR LEGACY**

For over 70 years, in the local community where the *Elements* editorial office is located, the residents have been living in the shadow of the Hanford nuclear production complex (eastern Washington, USA). During its heyday (1943–1987), this US government facility was responsible for producing 67.4 metric tons of plutonium for nuclear weapons from its 9 nuclear reactors and 5 processing plants. This was an inefficient process that generated ~53 million gallons of solid and liquid radioactive waste, which is stored in 177 large underground tanks, and ~450 billion gallons of liquids from the nuclear reactors which was discharged to soil disposal sites. This nuclear legacy remains today at the Hanford site. For the past 35 years, the US government has spent billions of dollars to monitor, characterize, contain, and clean up the waste at Hanford. Not only is this a complex and difficult process, but exactly where that waste will be permanently stored has yet to be decided as pointed out in this issue of *Elements*. Moreover, since 1984, the region has also been home to a commercial nuclear energy facility (Columbia Generating Station) that generates about 10% of all the electricity in the state of Washington—enough to power the city of Seattle. The spent nuclear fuel from this facility also needs a final, permanent resting place. While federal and regional governments tussle with the how and where to store hazardous nuclear waste, the local residents live with a nuclear legacy. We are all fortunate to have scientists, such as those who contributed to this issue of *Elements*, helping to advance the waste removal and repository processes.

*Elements* has now published three issues related to our shared global nuclear legacy. The December 2006 (v2n6) issue is a primer on the environmental aspects of the nuclear fuel cycle, and our June 2012 (v8n3) issue focuses on the Fukushima Daiichi nuclear accident following the catastrophic earthquake and tsunami that hit Japan in March 2011. With the addition of this third issue on geological repositories for nuclear waste, *Elements* readers now have an excellent set of resources on nuclear waste at their disposal (no pun intended!). We encourage you to read all three of these issues to increase your awareness of this global nuclear legacy. Also, use them in your classrooms to educate your students about this important subject ... it is one that will have an impact on future generations. Members can access all three of these issues at the *Elements* website.

**Jodi Rosso**

**ELEMENTS WEBSITE, FACEBOOK, TWITTER**

The new *Elements* website will be launched the first week of August 2016. Be sure to add a bookmark in your web browser to our homepage ([www.elementsmagazine.org](http://www.elementsmagazine.org)) to access the latest content, find past issues, read about our 17 member societies, learn about *Elements* and how to publish in the magazine, see our new meetings calendar, submit job postings, and so much more. Check it out!



*Elements* is also increasing its social media footprint. We are now on **Facebook** ([www.facebook.com/elementsmagazine/](http://www.facebook.com/elementsmagazine/)) and also on **Twitter** (@Elements\_Mag)! Stay connected. “Like” and “Follow” us.

**IMPACT FACTOR 2015**

*Elements* continues to be a widely read and cited magazine according to the recent 2016 Journal Citation Reports® that were released in June by Thomas Reuters. In 2015, *Elements* content received almost 2,100 citations and had an impact factor of 4.585, which is our highest ranking yet. *Elements* now ranks 2<sup>nd</sup> among all mineralogy journals and 5<sup>th</sup> among geochemistry and geophysics journals. Thank you to our participating societies, editorial team, guest editors, authors, and advertisers for making *Elements* such a well-respected magazine.

**Gordon Brown, Bernard Wood, Friedhelm von Blanckenburg, and Jodi Rosso**

**EDITORIAL** *Cont'd from page 227*

exit did so because they felt marginalized by their government and by the power structure of their country. The EU academics I spoke with were stunned by the exit decision. One thing that became clear to me after my limited exposure to UK public opinion was that the UK policy makers on both sides of the Brexit issue did not adequately educate the public, and some distorted the facts. The ultimate impact of this decision on UK and EU citizens is very difficult to predict.

Returning to the nuclear-waste disposal challenge, one issue that has become abundantly clear after 50 years of investigating potential nuclear-waste disposal schemes is that the site(s) selected must be both technically and socially acceptable (Metlay 2016). However, in order to convince the public that a proposed site (and its disposal technique) is acceptable, the public—as well as their representatives in local, state, and federal governments—must be educated. An excellent example of a successful public education campaign is the one that preceded the environmental cleanup of Rocky Flats (Colorado, USA), a US Environmental

Protection Agency (EPA) Superfund site located 16 miles from downtown Denver where, from 1952 to 1989, plutonium (Pu) pits for US nuclear weapons were manufactured. The buildings and soil at the Rocky Flats site became contaminated by Pu after a number of fires and leaks. A group of scientists from Los Alamos National Laboratory (New Mexico, USA) held public forums that incorporated scientific debate and stakeholder education about the best cleanup solutions. Extensive scientific studies showed that physical mechanisms, particularly colloid transport, dominated the transport of Pu at the site, and it was this knowledge that allowed the most extensive cleanup in the history of EPA Superfund legislation, with billions of dollars in taxpayer savings (Clark et al. 2006).

In closing, I recommend that those interested in some of the early thinking about geological disposal of nuclear waste read the book by Konrad Krauskopf (1988), my late Stanford colleague who was one of the clearest thinkers on this complex topic.

**Gordon E. Brown, Jr.**, Principal Editor

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