

RECENT FINDS FROM THE DUDLEY GRANITE-PEGMATITE BODY, KANGAROO ISLAND, SOUTH AUSTRALIA (text by David London)

Rob Cameron (ebonyridge@hotmail.com), the exploration manager for South Australia Lithium, and Patrick Gundersen (patrick@folk-stone.com), a gem prospector, have provided the following information and photos of recent finds (2015-2019) at the Dudley granite-pegmatite, located at the northeast end of the Dudley Peninsula, Kangaroo Island, South Australia (Figure 1). Outcrop is poor (Figure 2), however surface vestiges of the dikes (Figure 3) are traceable for kilometers on strike and meters across. The area is deeply weathered and has been a source of kaolin in the past (see the article by Bridget Jolly as an attachment). Another recent account by Geoffrey Chapman can be found at the website of the Kangaroo Island Pioneers Association (<https://www.kipioneers.org/contributions>). Both reports indicate that the area has a long history of exploitation for kaolin and feldspar, and that the discovery of gem-quality tourmaline goes back to the turn of the 20th century. Lithium Australia (<https://www.lithium-au.com/>) has posted a preliminary survey and assessment of their former leases (PDF attached). The tracts once leased by Lithium Australia are now held by South Australia Lithium.

Mr. Cameron reports that the coarsely pegmatitic portion of the body contains a spodumene-bearing zone. The spodumene found at surface is heavily altered. With the aid of an excavator, Mr. Gundersen uncovered miarolitic cavities lined with smoky quartz crystals along the roof, and with tourmaline along the floor. The cavities are said to be in a granitic material (Figure 4) that is not the same as a layered aplitic body that is associated with the pegmatite. Within the decomposed granite, Mr. Gundersen encountered a body of coarse muscovite that heralded underlying miarolitic cavities. Mr. Gundersen's finds from 2019 and previous visits include large smoky quartz crystals and gem-quality sections of tourmaline (Figure 5).

To put this find in context, Western Australia is home to many granitic pegmatites that have been mined for feldspar, lithium, tin, tantalum, and cesium. Occurrences of gem-quality minerals, however, are rare. Mark Jacobson (personal communication via email, October 2023) cited a half dozen other occurrences of gem minerals in pegmatites, mostly in WA. A plethora of granites from Victoria through New South Wales to Queensland do not have any associated pegmatites. Their mineralization is limited to tin-tungsten quartz veins. Gem-quality sapphire, ruby, and zircon are produced from near Inverness, NSW, but in these deposits the gem crystals occur as xenocrysts (inherited from other source rocks) in basalt. Australia is, of course, home to many diamond localities, the most famous of which is at Argyle, WA. Among the known pegmatitic sources, the deposits on Kangaroo Island appear to have considerable potential for gem tourmaline.

Figure 1. Location maps from Google Earth

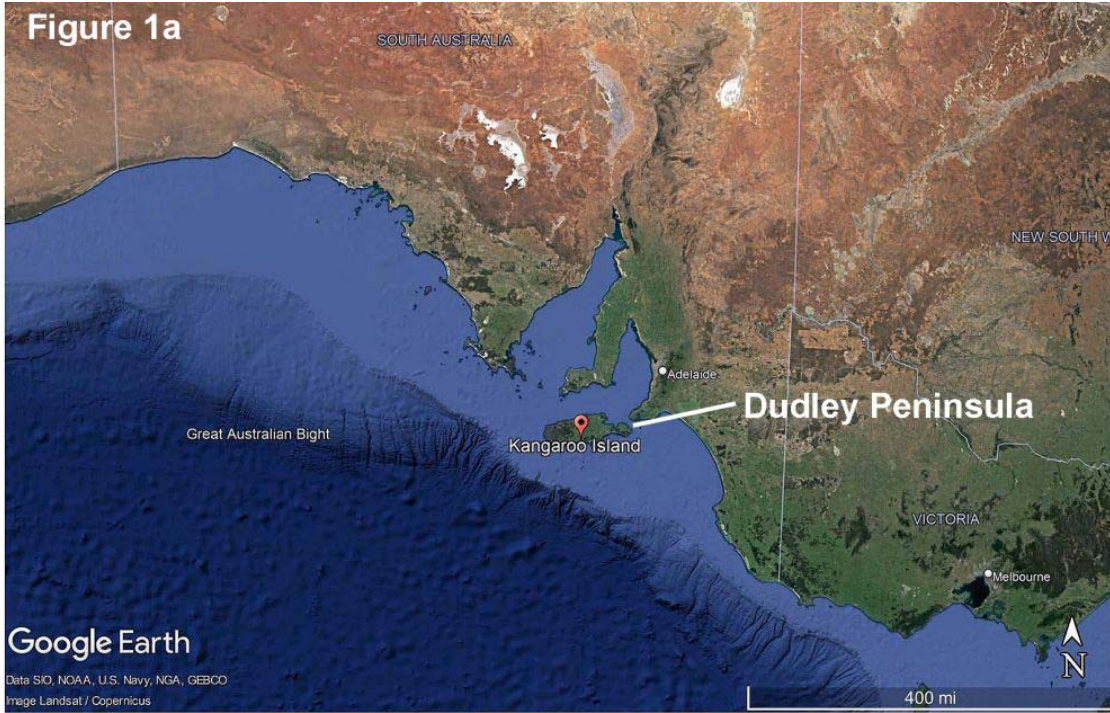


Figure 2. Surface rubble of pegmatitic quartz and feldspar. The rock mass contains dots of dark blue tourmaline. Rob Cameron photo.



Figure 3. This surface expression of the “Laneway Dyke” is regarded as good exposure in the region. Rob Cameron photo.



Figure 4. A miarolitic cavity in granite. The dark blue tourmaline at the base of the cavity is ~ 5 cm in length. The surface of a large smoky quartz crystal is visible at the back. The rock surrounding the cavity is coarsely crystalline granite. Patrick Gundersen photo.



Figure 5. Tourmaline crystals from Kangaroo Island, from 12 to 25 mm in dimension. Patrick Gundersen specimens and photo.



ATTACHMENTS

(1) Bridget Jolly (2016) The Kangaroo Island China Stone and Clay Company and its Forerunners. *Journal of the Historical Society of South Australia*, no. 44, pp. 5-20.

(2) Lithium Australia, ASX Announcement (2019) Lithium pegmatites identified at Dudley prospect, Kangaroo Island, South Australia

(3) Other links: <https://www.kipioneers.org/contributions>