

## **Green Sand Beach (Papakōlea), Big Island, State of Hawaii, USA.**

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**Green Sand Beach (Papakōlea), Big Island, State of Hawaii, USA.** Green Sand Beach, officially known as Papakōlea Beach, is one of two green sand beaches in the United States. The indigenous word is translated to mean “plover flats,” named after the Pacific golden plover (*Pluvialis fulva*) that nest here during the winter. The beach itself was created approximately 49,000 years ago when a cinder cone (Pu’u Mahana) was formed during an eruption of the Mauna Loa volcano. Green Sand Beach is the unique combination of olivine-rich lava deposits and other sand components. Olivine, which is locally known as “Hawaiian Diamonds,” are green glassy crystals that make up most of the sand on this beach. It is denser and tougher than the ash fragments, glass, and black pyroxene that make up the rest of the volcanic material on the beach. Ultimately, the green crystals that give the beach its name are mixed with black (lava) and white (coral/shells) sand, however, because of its unique location in a narrow bay, the lighter sand particles wash away out to the ocean and the heavier olivines remain behind on the beach. Therefore, Papakōlea Beach on the Big Island of Hawaii has one of the highest coastal olivine contents in the entire world. Swimming in the bay is possible; although, at times the surf can be rough, and there are no lifeguards stationed at the beach. (Photograph taken 11 September 2015 by Dr. Jay Jooyong Lee, Pusan National University [PNU], Busan, Republic of Korea.)