Geochronology, Geochemistry and Petrology of Neoproterozoic Granitoids and Sediments from the SMGC, India; Eastern India's role in the final amalgamation of Gondwana.

Thesis submitted in accordance with the requirements of the University of Adelaide for an Honours Degree in Geology

Anthony Rees

November 2015

THE UNIVERSITY of ADELAIDE

TITLE: GEOCHRONOLOGY, GEOCHEMISTRY AND PETROLOGY OF NEOPROTEROZOIC GRANITOIDS AND SEDIMENTS FROM THE SMGC, INDIA; EASTERN INDIA'S ROLE IN THE FINAL AMALGAMATION OF GONDWANA.

RUNNING TITLE: GEOCHRONOLOGY, GEOCHEMISTRY AND PETROLOGY OF NEOPROTEROZOIC GRANITOIDS AND SEDIMENTS FROM THE SMGC, INDIA

ABSTRACT

According to the Gondwana reconstructions, Western Australia lay next to the Shillong Plateau in north eastern India. The Neoproterozoic metasedimentary rocks known as the Shillong Group may represent the deposits of a sedimentary basin that lay between India and Australia before the formation of Gondwana. The aim of this study is to investigate the tectonic evolution of the India-Australia collision as Gondwana formed by constraining the age and provenience of The Shillong Group and the petrogenesis of the igneous intrusions found within it. U-Pb ICPMS zircon data from the metasediments show they have a maximum depositional age of 978.4±26.69Ma, and contain dominate age populations of ca. 1150, ca. 1180Ma and ca. 1750Ma. The crosscutting igneous rocks were dated with as 522±19Ma and were found to have geochemical signatures of magmatic arc rocks. These data have been interpreted as evidence that suggest that India collided with Gondwana during the Cambrian, marking the completion of the supercontinent Gondwana.

KEYWORDS

Gondwana, India, Pinjarra Orogeny, Meghalaya, Shillong Plateau

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES