Geochronological and Sedimentological Constraints of the Srisailam Formation, S.E. India

Ryan Gore

a1148570

October 2011

Centre for Tectonics, Resources and Exploration

School of Earth and Environmental Sciences

The University of Adelaide, South Australia

ryan.gore@student.adelaide.edu.au

TABLE OF CONTENTS

ABSTRACT

The Proterozoic Cuddapah Basin contains the poorly constrained Srisailam Formation, which presumably lies unconformably over the Nallamalai Group. The Cuddapah Basin is thought to have initiated as a rift basin > 1900 Ma before developing into a foreland basin due to uplift of the Eastern Ghats Belt (EGB) at ~1600 Ma. U-Pb geochronology indicates deposition of the Srisailam Formation commenced after 1660 Ma and ceased prior to the deposition of the Kurnool Group which was deposited < 1090 Ma. The Srisailam Formation was deposited in a tidal flat/shallow marine environment as it contains tidal and storms influences, glauconitic sandstones, along with bimodal east-west paleocurrents, which suggest links with an open seaway. Detrital zircon Hf isotope data combined with detrital zircon U-Pb data suggest the Dharwar Craton as a dominant source region with a mixed crustal evolution (ε_{Hf} -11 to +8). Detrital zircon age peaks at ~3200 Ma, ~2700-2400 Ma and ~2300 Ma imply that sediments are dominantly sourced from 3400-3000 Ma tonalite-trondhjemite-granodiorite (TTG), 3000-2500 Ma volcanosedimentary greenstone belts and 2600-2500 Ma calc-alkaline to K-rich granitic intrusions. Trace element data suggests zircon grains are sourced from granitoids with zircon crystallisation at ~860˚C. This study reveals that the Srisailam Formation is quite possibly a lateral equivalent of the Nallamalai Group.

Key Words: Cuddapah Basin, Srisailam Formation, Eastern Dharwar Craton (EDC), unconformably, Eastern Ghats Belt (EGB), sedimentary, geochronological, Nallamalai Group.