*Press Release under Embargo until 0600hrs 18th June 2013*

*Appendix I: Q&A for Coldest Journey Encampment Science*

Q. Why study Antarctica?

A. The extreme cold environment of the Antarctic & Arctic poles of planet Earth is crucial in providing stability to our global climate system (e.g. storage of 61% of Earth’s fresh water on Greenland & Antarctic Ice Sheets; regulation of global ocean heat conveyor belts, ocean storage of atmospheric carbon dioxide & provision of key ecological niches for marine food chains). Climate change (due to global warming caused by increases in man-made greenhouse gases) is having significant but complex effects on these vulnerable polar environments, fast becoming ‘early warning systems’ of global climate change.

Q. What is the scientific purpose of the Team’s current position on the main Antarctic Ice Sheet?

A. Although a 3OC air temperature rise is predicted to occur by 2100 over the main Antarctic Ice Sheet (AIS), the extreme cold conditions mean that the (over 1 km thick) AIS is not predicted to significantly melt this century. Nevertheless, the scientific mission of the Coldest Journey encampment is the opportunity to examine the chemistry, physics & biology of the area relevant to climate science.

Q. What projects are being undertaken, and why?

A. *Snow Dynamics & Moisture Transport*

* Capturing chemical (water isotope) & photographic data on changes in snow precipitation, drifting & surface features. The Team will also take this rare opportunity (only so far achieved in four other locations) to create a photographic record of how wind shapes the surface, height and spacing of drift features (sastrugi, ridges, etc) of undisturbed snow (surprisingly difficult to find on a typical traverse!). By analyzing the chemistry & physics of snow that is being re-mobilized, we will learn about atmospheric dynamics (wind action, moisture transport & surface temperature) on the main AIS during the winter months.

*Bacteria in the Extreme Cold*

* The Team will continue their recovery of snow/ice samples to document the biology of potentially unique cold-tolerant micro-organisms that can survive in this extreme environment. The objectives include conservation as the Antarctic warms, and the potentially recovery of novel microorganism strains for biotechnology applications.

*Measurement of the dynamics of coastal AIS drift*

* The naturally slow coastal-bound progress of the AIS (ultimately sloughing off as coastal glaciers into the Antarctic ocean) over the main Antarctic land mass may be affected by current warming trends (for example warmer seas causing increased underside melting of coastal glaciers). To analyze this, the explorers will make extensive fixes using handheld GPS throughout the encampment period. The onboard science caboose GPS unit will continue to provide centimetre precision geodetic quality GPS position fixes of the encampment. The aim is to integrate all the GPS data in order to measure the velocity (speed & direction) of movement of the coastal-bound ice sheets.

*‘Weather Observation Website’*

* The objective is to track weather conditions during the encampment, as an important adjunct to the scientific data. Meteorological data will be returned to the state-of-the-art educational tool ‘Weather Observation Website - WOW’ (<http://wow.metoffice.gov.uk>), a cloud-based system available in over 40 countries.

*White Mars Project*

* To document the physiological & psychological effects of extreme cold on the explorer team; ‘White Mars Project’. For details please see Appendix.

Q. How will this research be achieved?

A. The explorer team will undertake the science by collecting snow samples daily, and recording GPS data from the science caboose, & on foot in the locale of the encampment. The samples and data will be returned at the end of the journey to be processed by the scientific community to provide important data on climate change, ultimately for publishing in international peer-reviewed scientific journals.