

Table 3. *Analytical Methods at UMN.* The average procedural blanks for ^{232}Th , ^{230}Th and ^{231}Pa were 0.6021 ± 0.0045 pg/kg, 0.33 ± 0.19 fg/kg, and 0.037 ± 0.010 fg/kg, respectively. The limit of detection (LOD) is the smallest quantity of each isotope in samples that can reliably be detected or that can be statistically distinguished from a procedural blank. The LOD was considered to be 2 standard deviations above the average of the procedural blanks. Our LOD for ^{232}Th , ^{230}Th and ^{231}Pa were 0.009 pg/kg, 0.38 fg/kg, and 0.02 fg/kg, respectively.

UMN	Th-232 (pg/kg)	Th-230 (fg/kg)	Pa-231 (fg/kg)
Blanks (expressed per kg seawater, ± 2 sigma)	0.6021 ± 0.0045	0.33 ± 0.19	0.037 ± 0.010
	Th-232 (pg/kg)	Th-230 (fg/kg)	Pa-231 (fg/kg)
Limit of Detection	0.009	0.38	0.02
Standard reference material	Th-232 (pg/g)	Th-230 (fg/g)	Pa-231 (fg/g)
SWS2010-1 (n = 0)			
SWS2015-1 (n = 11)	169.1 ± 2.0	205.9 ± 3.6	40.0 ± 0.9