



*New Brunswick Laboratory*  
*U.S. Department of Energy*

**Certificate of Analysis**  
**CRM 107-A**  
**Monazite Sand – Silica Mixture**  
**Thorium Standard**

Thorium:  $0.1028_2 \pm 0.0002_7$  Wt.%  
( $\alpha = 0.05$ ,  $df = 18$ )

\*Uranium (calculated): 0.00408 Wt.%

This Certified Reference Material (CRM) was prepared by milling and blending NBL CRM 7-A Monazite Sand (9.7% ThO<sub>2</sub>) with silica (99.9% SiO<sub>2</sub>) to obtain a uniform mixture of desired thorium concentration. Characterization and certification analyses for thorium content were performed on ten (10) units selected from the packaged final product.

The certified value listed above is expressed in terms of 95% confidence limits, defined as  $\bar{x} \pm \sigma \cdot t$ , where  $\bar{x}$  is the unweighted mean of the measurement data,  $\sigma$  is the standard deviation of the mean, and  $t$  is the Student's  $t$  value for the indicated degrees of freedom ( $df$ ) and at the 5% significance level ( $\alpha$ ).

REFERENCE METHODS OF ANALYSIS: Spectrophotometry verified with NBL Thorium Oxide (ThO<sub>2</sub>).

\*Calculation is based on the uranium oxide (U<sub>3</sub>O<sub>8</sub>) value of  $0.399_3 \pm 0.017_1$  Wt% U<sub>3</sub>O<sub>8</sub> for NBL CRM 7-A Monazite Sand.

March 1, 2008  
Argonne, Illinois

[www.nbl.doe.gov](http://www.nbl.doe.gov)  
Page 1 of 1

Jon Neuhoff, Director  
New Brunswick Laboratory

(Editorial revision of NBL Certificate dated February 1981)