

# Alpha Resources, Inc.

## Certificate Of Analysis

AR-4015  
CARBON AND SULFUR IN SOIL  
LOT # 213B

% CARBON  
MEAN = 1.18  
One Sigma Standard Deviation = 0.04  
Expanded Uncertainty = 0.08  
(k=2, 95% confidence)

% SULFUR  
MEAN = 0.12  
One Sigma Standard Deviation = 0.01  
Expanded Uncertainty = 0.02  
(k=2, 95% confidence)

This data was reported using induction and resistance type furnaces with infrared detection. Accelerants like vanadium pent-oxide (V<sub>2</sub>O<sub>5</sub>) and tungsten oxide (WO<sub>3</sub>) were used in the resistance furnace. Tungsten metal and iron chip were used in the induction analysis.

### Standards Employed for traceability:

NCS	CaCO <sub>2</sub> , BaSO <sub>4</sub>
NIST	DC70019 (S), DC73326 (C)
BAM	16e, 368, 6g 079-1

### Notes:

The mean analytical values were derived by 6 data sets (n=60) showing traceability to the above mentioned NMI and high purity standards, and reported in mass fraction. The precision values represent the estimated uncertainty derived from analysis and may not represent your testing capabilities. Refer to your test method for the expanded method derived uncertainty if needed. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Technical Manager, at Alpha Resources.

There were limited primary standards of this type of matrix available at the time of certification. Multiple types of reference materials were used in the certification process, ranging from steel to high purity inorganic for calibration and quality verifications. This bottle contains 25g of fine powder to be used directly from the bottle without preparation, and has an indefinite shelf life.

The material used in production of this standard was sampled in accordance with ARI 032. The samples for round robin testing were selected in accordance with ARI 014. The above values relate only to the material used to produce this standard.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages.

This is a Certified Reference Material (Working Standard), and is traceable to the above-mentioned standards. For good laboratory practice it is recommended that all standards be verified prior to use.

Certified April 1, 2013



Technical Manager