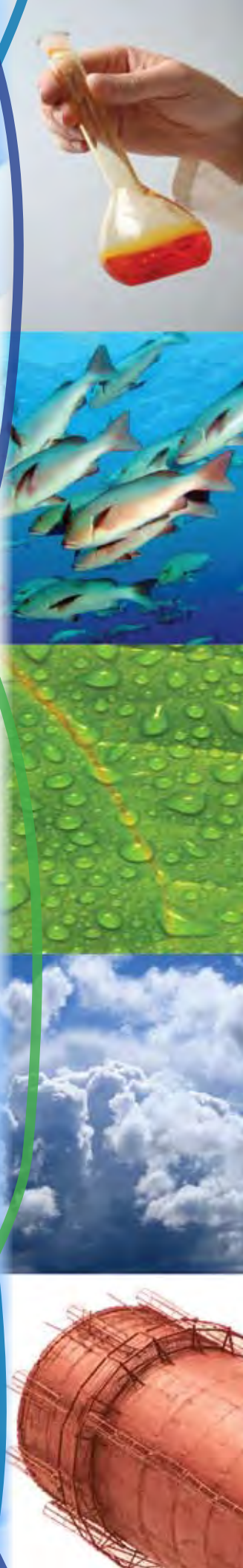


*“...timely, professional, and knowledgeable... Brooks Rand Labs stands out as one of the best in client services.”*

*Forrest Dierberg, Ph.D.  
Vice President and Laboratory Director  
DB Environmental, Inc.*

# ADVANCED ANALYTICAL SERVICES

***Specializing in superior quality trace metals analytical services, Brooks Rand Labs focuses on metals speciation, trace level detection limits, and the analysis of complex matrices.***



# Example Detection Limits

## Experience & Expertise

Since 1982, Brooks Rand Labs has specialized in providing the highest quality trace metals analytical services and instrumentation. While many labs have just recently begun to offer methods for low-level metals determination, Brooks Rand Labs has been offering low-level mercury and methylmercury analytical services for over 20 years!

Low detection limits, outstanding data quality, and unparalleled customer service have established Brooks Rand Labs as the premier specialty metals analytical laboratory services provider. As experts in the determination and characterization of trace metals in complex matrices, Brooks Rand Labs has the capabilities to meet even the most challenging project requirements. Ultra-clean, pre-tested sampling equipment delivered directly, fast turn-around-time options, and custom reporting packages at competitive prices ensure that our clients receive the quality data they require to make critical decisions.

## Ultra-low Detection Limits

Brooks Rand Labs consistently strives to achieve detection and reporting limits that are among the lowest commercially available. Performance based evaluations of laboratory techniques ensure the most accurate and precise measurements at even the lowest concentrations. Ultra-clean facilities, laboratory equipment, and reagents, custom designed state-of-the-art instrumentation, and constantly improving methods allow Brooks Rand Labs to provide meaningful metals concentrations data in even the most challenging matrices.

## Outstanding Data Quality

As an ultra-low level trace metals analytical laboratory, Brooks Rand Labs appreciates how important high quality data is for our clients. All our data is subjected to a rigorous multi-level review process to ensure only the most credible and scientifically defensible data is provided to our clients. The accuracy and precision of our data are constantly proven by internal and client-requested laboratory audits; consequently, Brooks Rand Labs is proudly NELAP accredited through the State of Florida Dept. of Health and certified in many additional states.

## Unparalleled Customer Service

The project management team at Brooks Rand Labs provides clients with an unparalleled level of support from initial project planning, to data validation and interpretation, and project follow-up. They review quality assurance and sampling plans, advise on sampling procedures, and produce custom reporting packages that are superior to other analytical laboratories.

Analyte (fraction)	Fresh Water $\mu\text{g/L}$	Saline Water $\mu\text{g/L}$	Soil/Sediment $\text{mg/kg}$	Biota $\text{mg/kg}$
Ag silver	0.004	0.001	0.015	0.010
Al aluminum	0.13	6.5	0.5	0.14
As arsenic	0.005	0.03	0.05	0.003
As(III)	0.008	0.008	0.030	0.003
As(V)	0.008	0.008	0.030	0.003
As(inorganic)	0.008	0.008	0.003	0.003
As(monomethyl)	0.010	0.010	0.004	0.003
As(dimethyl)	0.018	0.018	0.005	0.003
B boron	0.30	15	1.4	0.08
Ba barium	0.01	0.50	0.10	0.02
Be beryllium	0.012	0.006	0.15	0.008
Cd cadmium	0.002	0.003	0.014	0.003
Co cobalt	0.010	0.020	0.05	0.02
Cr chromium	0.009	0.04	0.16	0.018
Cr(III)	0.010	0.5	1.5	1.5
Cr(VI)	0.010	0.5	1.5	1.5
Cu copper	0.011	0.04	0.10	0.03
Fe iron	0.24	6.0	3.2	0.04
Fe(labile)	7.3	7.3	-	-
Fe(II)	7.8	7.8	-	-
Fe(III)	7.8	7.8	-	-
Hg mercury	0.00015	0.00015	0.00005	0.00004
Hg(methyl)	0.000010	0.000010	0.000008	0.00007
Mg magnesium	0.60	30	2.5	0.30
Mn manganese	0.010	0.50	0.007	0.03
Mo molybdenum	0.004	0.20	0.10	0.004
Ni nickel	0.02	0.04	0.20	0.05
Pb lead	0.015	0.002	0.03	0.004
Sb antimony	0.005	0.004	0.04	0.003
Se selenium	0.015	0.04	0.16	0.02
Se(IV)	0.020	1	0.05	0.05
Se(VI)	0.020	1	0.05	0.05
Sn tin	0.030	1.5	0.030	0.05
Sr strontium	0.010	0.5	0.010	0.007
Ti titanium	0.04	2	0.30	0.05
Tl thallium	0.002	0.002	0.010	0.002
U uranium	0.002	0.1	0.010	0.008
V vanadium	0.010	0.010	0.08	0.014
Zn zinc	0.028	0.26	0.25	0.28

*This is only a partial list of available services. Method detection limits (MDL) are subject to change. Additional analytes or client/matrix-specific MDLs may be developed upon request. Contact a BRL representative to learn more.*

## Complex Matrices

Unlike many laboratories, Brooks Rand Labs has extensive capabilities to analyze low-level trace metals in even the most complex matrices.

- seawater
- industrial wastewater
- atmospheric deposition
- soil, sediment, & sludge
- plant & animal tissues
- blood, urine, & hair
- food products
- cosmetics
- ambient air
- flue gas
- coal & coal byproducts
- FGD wastewater

## Rare-Earth Elements

Analyte	MDL ( $\mu\text{g/L}$ )
Ce	0.0010
Dy	~0.01
Er	~0.01
Eu	~0.01
Gd	~0.01
Ho	~0.01
La	0.0010
Lu	0.0010
Nd	~0.01
Pm	~0.01
Pr	~0.01
Sc	0.04
Sm	~0.01
Tb	0.0010
Tm	0.0011
Yb	~0.01
Y	0.0013

## “True” Total Metals in Solids

For the determination of true total metals in soils, sediments, and other solid samples, an elevated-temperature and pressure hydrofluoric acid (HF) bomb digestion procedure dissolves even silicate-bound metals.

Analyte	MDL ( $\text{mg/kg}$ )
Ag	0.018
As	0.10
Ba	0.25
Be	0.15
Cd	0.015
Co	0.05
Cr	0.23
Cu	0.11
Mn	0.08
Mo	0.10
Ni	0.25
Pb	0.03
Sb	0.04
Se	0.30
Sn	0.10
Sr	0.04
Ti	0.50
Tl	0.034
V	0.29
Zn	0.25

## Speciation & Mobility

Despite the growing interest in the regulatory community concerning bioavailability, Brooks Rand Labs remains one of the few experts in providing commercially practical analytical solutions for the speciation of various toxic trace metals with specific valence states or characteristics. Through advanced separation techniques, we are able to quantify arsenic, chromium, iron, selenium, and mercury concentrations in multiple matrices according to the fraction of interest, with new capabilities added regularly.

## Custom Method Development

Often – due to a specific matrix type, analyte of interest, or required method detection limit – projects necessitate the development of custom methods in order to achieve their objectives. Brooks Rand Labs has extensive experience developing previously unavailable methods and consistently exceeds even the most rigorous requirements and client expectations.