

Wyoming Analytical Laboratories, Inc.

Prices as of Spring, 2009



This electronic price book is a general guideline to WAL prices. Please call for specific price quotes.

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GENERAL INFORMATION

1660 Harrison Street
Laramie, WY 82070
(307) 742-7995

625 Center Street
Rock Springs, WY 82901
(307) 362-3176

14335 West 44th Avenue
Golden, CO 80403
(303) 278-2446

Normally samples may be submitted to any of our locations.

Standard turn-around-times (TAT) are 10 working days, expedited TAT can usually be honored for a premium.

If you require a quick TAT, check with the lab facility to verify that the current work-load will allow for rush samples.

If the lab can honor your request for quick TAT, premiums can then be agreed upon .

Premiums for accelerated work are as follows:

For same day turnaround, add 300%

1 working day, add 100%

4-5 working days, add 30%

2-3 working days, add 50%

6-7 working days, add 15%

The Following terms and conditions will apply to all goods and services by
Wyoming Analytical Laboratories, Inc. (WAL)

Payment in full is due upon receipt of invoice, or as specified in prearranged terms

1. WAL reserves the right to terminate the customer's credit and refuse to perform additional services on a credit basis if any credit balance is outstanding for more than 60 days or when any amount exceeds the established line of credit.
2. Prices quoted to the customer will remain effective for 90 days unless otherwise stated in writing by WAL at the time of quotation.
3. Any schedule of fees and changes issued by WAL may be changed from time to time by WAL as to future services.
4. The analyses, opinions or interpretation of results by WAL, in response to a customer request upon observation of materials provided by the customer and express the best judgement of WAL. WAL will endeavor to perform its services and report accurate and complete results, all in accordance with standards and practices of the industry. WAL does not guarantee results and its sole liability will be to redo the test and render a new report to the customer any payment made by the customer for a report which does not meet industry standards or practices.
5. WAL will hold in confidence all information it receives from the customer and the results of all tests and other services provided to the customer.

EXCEPT AS NOTED ABOVE, WAL MAKES NO REPRESENTATION OR WARRANTY, EXPRESS IMPLIED OR STATUTORY, REGARDING ITS SERVICES, OBTAINED OR ITS REPORT

WATER

Definitions of Metal Types

Total Metals: Metals concentrations determined in a sample following acid digestion (EPA SW-846 Method 3010, 3015, 3020, 3050, 3051 or 3052).

Total Recoverable Metals: Metals concentration in an unfiltered sample treated with hot dilute mineral acid. (Method 3005)

Suspended Metals: Metals concentration determined in sample portion retained by a 0.45- μ m filter. (EPA Method 3005)

Dissolved Metals: Metals concentration determined in a sample filtered through a 0.45- μ m filter. (EPA Method 3005)

Metal Digestion		Price
Acid Digestion for Total Metals		\$24.00
Total Recoverable		\$11.00
Filtration for Dissolved Metals or other Analytes		\$6.00
ICP / ICP-MS Metals		Price
Aluminum (Al)	6010/6020 200.7/200.8	\$14.00
Antimony (Sb)	6010/6020 200.7/200.8	\$14.00
Arsenic (As)	6010/6020 200.7/200.8	\$14.00
Barium (Ba)	6010/6020 200.7/200.8	\$14.00
Beryllium (Be)	6010/6020 200.7/200.8	\$14.00
Bismuth (Bi)	6010/6020 200.7/200.8	\$14.00
Boron (B)	6010/6020 200.7/200.8	\$14.00
Cadmium (Cd)	6010/6020 200.7/200.8	\$14.00
Calcium (Ca)	6010/6020 200.7/200.8	\$14.00
Chromium (Cr)	6010/6020 200.7/200.8	\$14.00
Cobalt (Co)	6010/6020 200.7/200.8	\$14.00
Copper (Cu)	6010/6020 200.7/200.8	\$14.00
Gallium (Ga)	6010/6020 200.7/200.8	Inquire
Gold (Ag)	6010/6020 200.7/200.8	\$14.00
Iron (Fe)	6010/6020 200.7/200.8	\$14.00
Lead (Pb)	6010/6020 200.7/200.8	\$14.00
Lithium (Li)	6010/6020 200.7/200.8	\$14.00
Magnesium (Mg)	6010/6020 200.7/200.8	\$14.00
Manganese (Mn)	6010/6020 200.7/200.8	\$14.00
Mercury (Hg)	6010/6020 200.7/200.8	\$15.00
Molybdenum (Mo)	6010/6020 200.7/200.8	\$14.00
Nickel (Ni)	6010/6020 200.7/200.8	\$14.00
Palladium (Pd)	6010/6020 200.7/200.8	\$14.00
Platinum (Pt)	6010/6020 200.7/200.8	\$14.00
Potassium (K)	6010/6020 200.7/200.8	\$14.00
Rubidium (Rb)	6010/6020 200.7/200.8	Inquire
Selenium (Se)	6010/6020 200.7/200.8	\$14.00
Silicon (Si)	6010/6020 200.7/200.8	\$15.00
Silver (Ag)	6010/6020 200.7/200.8	\$15.00
Sodium (Na)	6010/6020 200.7/200.8	\$14.00
Strontium (Sr)	6010/6020 200.7/200.8	\$14.00
Tellurium (Te)	6010/6020 200.7/200.8	Inquire
Thallium (Tl)	6010/6020 200.7/200.8	\$15.00
Tin (Sn)	6010/6020 200.7/200.8	\$14.00
Titanium (Ti)	6010/6020 200.7/200.8	\$14.00
Tungsten (W)	6010/6020 200.7/200.8	\$14.00

Uranium (U)	6010/6020 200.7/200.8	Inquire
Vanadium (Va)	6010/6020 200.7/200.8	\$14.00
Zinc (Zn)	6010/6020 200.7/200.8	\$14.00
ICP: Inductively Coupled Argon Plasma Spectrometry		
Low Level Metals by ICP-MS / HGICP / CVAA	6020 200.8	Price
Antimony (Sb)		\$35.00
Arsenic (As)		\$35.00
Lead (Pb)		\$35.00
Selenium (Se)		\$35.00
Mercury (Hg)		\$48.00
ICP-MS Inductively coupled plasma – mass spectrometry		
HGICP: Hydride Generation followed by ICP		
CVAA: Cold Vapor Atomic Spectrophotometry		
Biological Testing		5Price
E Coli and Total (Pass / Fail), Laramie		\$35.00
Fecal (Colony Count), Rock Springs		\$35.00
Total / E Coli (MPN), Rock Springs		\$35.00
Heterotrophic Plate Count, Rock Springs		\$40.00
BART Sulfur reducing bacteria		\$30.00
BART Iron fixing bacteria		\$30.00

Ion Chromatography	Method	Price
Anion Scan (Br ⁻ , Cl ⁻ , F ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , PO ₄ ⁻³ , SO ₄ ⁻²)	EPA Method 300.0	\$55.00
Chloride single ion analysis		\$35.00
Fluoride single ion analysis		\$35.00
Nitrate single ion analysis		\$35.00
Sulfate single ion analysis		\$35.00
Other Analytes		Inquire

Metal Groupings	Minimum Charge	Price
Safe Drinking Water Act As, Ba, Be, Cd, Cr, Hg, Ni, Sb, Se, Tl		\$ 140.00
Priority Pollutant List Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn		\$150.00
Target Analyte Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, Zn		\$220.00
Add CN		\$ 50.00
Precious Metals, Group 1*: Ag, Au, Pb, Pt		\$ 50.00
Precious Metals, Group 2*: Ag, Au, Ir, Pd, Pt, Rh		\$ 65.00
*May required additional aqua regia digestion		\$ 20.00
Chromium, hexavalent (Cr⁺⁶; Cr^{IV})		\$40.00
Lead in Paint (2 or more samples, \$40 each)		\$50.00

Other Analytes	Method	Price
Anions by ion chromatography	EPA Method 300	\$55.00
Alkalinity (carbonate, bicarbonate, hydroxide)	EPA 310.1	\$25.00
Bicarbonate		\$16.00
Carbonate		\$16.00
Langelier Index		\$50.00
Temperature, °C (as measured in the lab)		\$ 5.00
Hardness		\$22.00
pH		\$12.00
Resistivity		\$12.00
Conductivity		\$12.00
Turbidity		\$30.00
Bromide (Br)		\$30.00
Chloride (Cl)	SM 4500B	\$30.00
Residual Chlorine (as measured in the lab)		\$16.00
Total Chlorine (as measured in the lab)		\$16.00
Free Chlorine (as measured in the lab)		\$16.00
Fluoride (F)		\$30.00
Cyanide (minimum of 2 samples)		\$50.00
Nitrogen		
Ammonia, as N		\$35.00
Kjeldahl Nitrogen, as N		\$60.00
Nitrate, as N		\$25.00
Nitrite, as N		\$25.00
Nitrate + Nitrite, as N		\$25.00
Organic Nitrogen		\$50.00
Total Nitrogen		\$50.00
Phosphorous, ortho		\$30.00
Phosphorous, total		\$30.00
Oil and Grease (Freon extraction)	Method EPA 418.1	Inquire
Oil and Grease (hexane extraction)	EPA Method 1664	\$75.00
TPH (Freon extraction)	Method EPA 418.1	\$165.00
Phenols	EPA SW-846 9065	\$65.00
Solids		
Total Suspended Solids (TSS)	160.1	\$14.00
Total Dissolved Solids (TDS)	160.2	\$14.00
Total Solids (TS)	160.3	\$14.00
Total Volatile Solids (TVS)	160.4	\$15.00
Specific Gravity (by hydrometer)		\$10.00
Sulfate		\$18.00
Sulfide		\$45.00
Total Organic Carbon (TOC)	EPA SW-846 9060	\$45.00
Total Organic Halogens (TOX)		Inquire
Biological Oxygen Demand (BOD)		\$50.00
Chemical Oxygen Demand (COD)		\$50.00
Dissolved Oxygen (DO)		\$28.00
Glycol Detection (Presence / Absence)		\$40.00

POTABILITY TESTING

Group 1 (Human Consumption)

Group 2 (Agriculture)

Group 3 (Livestock)

Calcium
Magnesium
Sodium
Potassium
Sulfate
Nitrate as N
TDS

Hardness
pH
Iron
Bicarbonate
Carbonate
Chloride
Conductivity

Calcium
Magnesium
Sodium
Sulfate
Nitrate
TDS
Hardness
pH

Calcium
Magnesium
Sodium
Sulfate
Nitrate as N
TDS
Hardness

ANALYSIS	PRICE
Group 1 (for human consumption)	\$126.00
Group 2 (for agriculture)	\$96.00
Group 3 (for livestock)	\$76.00
Fluoride	\$20.00
Lead	\$14.00
Copper	\$14.00
Total and Fecal Coliform Bacteria (combined)	\$38.00
Total + E. Coli	\$38.00
Total + Fecal + E.Coli	\$40.00
Fecal Failure – 2 nd run sampling fee for E. Coli	\$10.00
*Total Organic Carbon (TOC)	\$45.00

**TOC is a good general indicator of organic contaminants in drinking water*

Note: *Samples requiring chemical testing must be received in the laboratory before 2:00 pm Monday through Thursday in order for these prices to be effective.*

Samples received on an unscheduled day will be charged as follows:

ANALYSIS	PRICE
Group 1	\$155.00
Group 2	\$120.00
Group 3	\$100.00
Coliform received on Friday (results on Saturday)	\$65.00
Other	Call

PLEASE NOTE: OUR MINIMUM BILLING CHARGE IS \$50.00

Certain analyses must be initiated with 24 hours of sampling because of limited holding times for the analytes involved (bacteria and nitrate, for example). Samples must, therefore, be received in the lab within 24 hours of sampling to ensure the most accurate results.

WATER — Chain of Custody/Service Request

Wyoming Analytical Laboratories, Inc.

1660 Harrison Street
Laramie, WY 82070
(307) 742-7995
Fax: (307) 721-8956

625 Center Street
Rock Springs, WY 82901
(307) 362-3176
Fax: (307) 362-3581

5810 Lamar St. #14
Arvada, CO 80003
(303) 424-1002
Fax: (303) 424-0775

Project:	Billing Information
Send Report to:	Name:
Address:	Company Name:
City: State: Zip:	Address:
Phone:	City: State: Zip:
Fax:	Phone: Fax:
E-mail:	E-mail Results: Yes / No
PO Number:	Fax Results: Yes / No

Sample Identification	Metals	As, Sb, Pb, Se	Low Levels	Alk, Bicarb/Carb	Cl,F,Br,P,TOT	BOD, COD, TOC			Total number of Containers _____	Date/Time	Special Instructions

Matrix: Water – **W**; **X** – other, (please specify) _____

Sample Transfer Record (1)

Sample Transfer Record (2)

Relinquished by: _____
Signature: _____
Date: _____

Received by: _____
Signature: _____
Date: _____

Relinquished by: _____
Signature: _____
Date: _____

Received by: _____
Signature: _____
Date: _____

Please make photocopies of this form to accompany water samples submitted to WAL for analysis.

POTABILITY — CHAIN of CUSTODY

1660 Harrison Street
Laramie, WY 82070
(307) 742-7995
Fax: (307) 721-8956

625 Center Street
Rock Springs, WY 82901
(307) 362-3176
Fax: (307) 362-3581

Note: Results will be furnished to the person or business name that appears on this chain of custody.
Copies will not be issued to a third party without written authorization..

Company Name (If applicable) _____
Name _____
Address _____
City _____ State _____ Zip Code _____
Phone _____ Fax Number _____
E-mail _____

New Property? Yes _____ No _____ New Well? Yes _____ No _____

Sample Identification: _____

Date Sample Taken: _____ Time Sample Taken: _____

Analysis: (when submitted Monday through Thursday before 2pm*)

Group 1	@	\$105.00 (Human Consumption)	= \$	_____
Group 2	@	\$87.00 (Agriculture)	= \$	_____
Group 3	@	\$69.00 (Livestock)	= \$	_____
Coliform Bacteria	@	\$33.00	= \$	_____
Lead	@	\$14.00	= \$	_____
Copper	@	\$14.00	= \$	_____
Fluoride	@	\$20.00	= \$	_____
Other	@	inquire	= \$	_____
		Amount Due	= \$	_____
		Amount Paid	= \$	_____

Signature: _____

Date: _____

An additional fee will be charged for samples brought in on an unscheduled day.

STANDARD TURNAROUND TIME IS 5 WORKING DAYS

Non-Standard turnaround times:

For same day turnaround, add 300%	1 working day, add 100%
2 working days, add 50%	3 working days, add 30%
4 working days, add 15%	

Coliform samples cannot be analyzed on the same-day basis.

**Coliform samples require a sterilized container.*

Sample container kits with instructions are available at no charge; please inquire.

Note: Acceptance of any sample requiring a turnaround time other than the standard is at the discretion of Wyoming Analytical Laboratories, Inc. and is based on the number of samples currently in-house.
Please feel free to make photocopies of this chain of custody to accompany drinking water samples submitted to WAL for analysis.

CONTAINERS, PRESERVATIVES & HOLDING TIMES

Metals

Analyte	Method	Container	Preservative	Holding Time
<u>Metals, dissolved</u>				
Metals	SW-846 / 600 series	1 - 250mL poly	Field filter	180/28 days
8 RCRA, 13 Priority Pollutants	SW-846 / 600 series	1 - 500mL poly	Field filter	180/28 days
23 HSL	SW-846 / 600 series	1 -1L poly	Filed filter	180/28 days
Hexavalent Chromium	SM3500 CR-D	1 - 500mL poly	4°C	24 hours
<u>Metals, total, total recoverable</u>				
Metals	SW-846 / 600 series	1-250mL poly	2mL 1:1 HNO ₃	180/28 days
8 RCRA, 13 Priority Pollutants	SW-846 / 600 series	1-500mL poly	2mL 1:1 HNO ₃	180/28 days
23 HSL	SW-846 / 600 series	1-1L poly	5mL 1:1 HNO ₃	180/28 days

Water

Analyte	Method	Container	Preservative	Holding Time
Alkalinity / CO ₂ / HCO ₃ or Acidity	310.1 or 305.1	1 - 125mL poly	4°C	14 days
Ammonia	SM4500-NH3F	1 - 500mL poly	4°C, 2mL 1:1 H ₂ SO ₄	28 days
Anions - NO ₂ , NO ₃ , PO, SO ₄ , Br, Cl	300 (IC method)	1 - 125mL poly	4°C	2/28 days
BOD	405.1	1 - 1L poly	4°C	48 hours
BTEX / MTBE / Purgeable Aromatics	8020 / 624	2 - 40mL vials	4°C, 0.5mL 1:1 HCl	14 days
Carbamates	632	1 - 1L amber	4°C	7 days
COD	410.4	1 - 125mL amber	4°C, 2mL 1:1 H ₂ SO ₄	28 days
Coliform – Fecal & Total (drinking water)	Colilert	1 - 110mL, sterile	4°C -Na ₂ S ₂ O ₃	24 hours
Color	110.2	1 - 125mL amber	4°C	48 hours
Cyanide – Total, WAD, Amenable	335.1 / .2 / 9010	1 - 1L poly	4°C, 10mL 10N NaOH	14 days
Dissolved Oxygen	360.1	BOD Bottle	4°C	24 hours
Flashpoint	1010 / ASTM D-93	1 - 250mL amber	4°C	28 days
Fluoride	340.2	1 - 125mL poly	4°C	28 days
Formaldehyde	8315	1 - 1L amber	4°C	3 days
Glycol / Alcohol	8015	1 - 20mL vial	4°C	14 days
Herbicides	8150	1 - 80oz amber	4°C	7 days
Ignitability	1010	1 - 250mL glass	4°C	28 days
Langelier Index	SM2330B	1 - 1L poly	4°C	ASAP
Nitrate/Nitrite		1 - 125mL poly	4°C, H ₂ SO ₄	28 days
Odor	140.1	1 - 1L amber	4°C	48 hours
Oil & Grease	1664	1 - 1L amber	4°C, 5mL 1:1 H ₂ SO ₄	28 days
Pesticides / PCBs	8080/608 or 8140	1 - 80oz amber	4°C	7 days
PCB Screen	8080 mod.	1 - 125mL amber	4°C	7 days
pH – corrosivity	150.1	1 - 125mL poly	4°C	ASAP
Phenols, Total	420.1	1 - 1L amber	4°C, 5mL 1:1 H ₂ SO ₄	28 days
Phenols	8040	1 - 80oz amber	4°C	7 days
Purgeable Halocarbons	8260 / 624	2 - 40mL vials	4°C	14 days
Reactivity – CN, Sulfide	SW846	1 - 250mL poly	4°C, 2mL 10N Zn acetate	7 days
Residual Chlorine	330.5	1 - 250mL amber	4°C	24 hours
Semi-volatiles (BNA/PNA)	8270 / 625	1 - 80oz amber	4°C	5 days
Specific Conductance	120.1 / 9050	1 - 125mL poly	4°C	28 days
Sulfide	376.1 / 9030	1 - 500mL poly	4°C, 5mL 10N Zn acetate	7 days
Sulfite	377.1	1 - 500mL poly	4°C, 0.5g Zn acetate, 5mL EDTA	7 days
Surfactants (MBAS)	425.1	1 -1L poly	4°C	48 hours
TCLP BNA, Pest, Herb, Metals	1311 / SW846	1 - 80oz amber	4°C	14 days
TCLP Metals	1311 / 6010,7470	1 - 1L poly	4°C	180/28 days
TCLP VOA	1311 / 8260	1 - 250mL amber	4°C	14 days
TEPH (Diesel) Fuel ID / DRO	8015 mod	1 - 1L amber	4°C	7 days
TVPH (Gasoline)	8015 mod	2 - 40mL vials	4°C, 0.5mL 1:1 HCl	14 days
Total Organic Carbon-TOC	9060 / 415.1	1 - 125mL amber	4°C, 2mL 1:1 H ₂ SO ₄	28 days
Total Organic Halogens-TOX	9020	1 - 500mL amber	4°C, 3mL 1:1 H ₂ SO ₄	28 days
Total Halogens – TX (oil)	9020 mod	1 - 20mL vial	4°C	none
TRPH	418.1	1 - 1L amber	4°C, 5mL 1:1 HCl	28 days
TS/TDS/TSS	160.1 / .2	1 - 500mL poly	4°C	7 days
Turbidity	180.1	1 - 125mL poly	4°C	48 hours
VOAs	8260 / 624	2 - 40mL vials	4°C, 0.5mL 1:1 HCl	14 days

Drinking Water

Analyte	EPA Method	Container	Preservative	Holding Time
VOC / Trihalomethanes	524.2	4-40mL vials	4°C 20mg ascorbic acid, add	14 days
SOC	525.1	1-1L amber	4°C 55mg Na ₂ SO ₃ +HCl	7 days
Nitrogen / Phosphorus Pesticides	507	1-1L amber	4°C 80mg Na ₂ S ₂ O ₃	7 days
Pesticides / PCBs	508	1-1L amber	4°C 80mg Na ₂ S ₂ O ₃	7 days
Herbicides	515	1-1L amber	4°C 80mg Na ₂ S ₂ O ₃	14 days
EDB / DBCP	504	2-40mL vials	4°C 3mg Na ₂ S ₂ O ₃	28 days
Carbamates	531.1	1-125mL amber	4°C 10mg Na ₂ S ₂ O ₃ +MCAA	28 days
Diquat	549	1-500mL polyamber	4°C 50mg Na ₂ S ₂ O ₃	7 days
Endothal	548	1-125mL amber	4°C	7 days
Glyphosate	547 mod	1-125mL amber	4°C 12mg Na ₂ S ₂ O ₃	14 days
Lead and Copper Rule	239.2 / 200.7	1-1L poly	5mL 1:1 HNO ₃ (unpreserved if a private residence)	180 days

Soil

Analyte	Method	Container	Preservative	Holding Time
Anions - Br, Cl, NO ₂ , NO ₃ , PO ₄ , SO ₄	300.0	1-2oz wm	4°C	28 days
BTEX / MTBE / Purgeable Aromatics	8020	2-2oz wm	4°C	14 days
Corrosivity / pH	150.1	1-2oz wm	4°C	14 days
Cyanide	335.2	1-2oz wm	4°C	28 days
Extractable Organic Halogens – EOX	9020 mod	1-2oz wm	4°C	28 days
Herbicides	8150	1-4oz wm	4°C	14 days
Ignitability / Flashpoint	1010 / ASTM D93	1-8oz wm	4°C	28 days
Oil and Grease	413.1	1-4oz wm	4°C	28 days
Paint Filter Test	9095	1-4oz wm	4°C	28 days
Pesticides / PCBs	8080 or 8140	1-4oz wm	4°C	14 days
Phenols (Total)	420.1	1-4oz wm	4°C	14 days
Reactivity	SW846	1-2oz wm	4°C	28 days
Semi-volatiles (BNA, PNA)	8270	1-4oz wm	4°C	14 days
TCLP Volatiles	1311 / 8260	1-4oz wm	4°C	14 days
TCLP BNA, Pest, Herb	1311/ 8270,8080,8150	1-6oz wm	4°C	14 days
TCLP Metals	1311 / 6010,7470	1-4oz wm	4°C	180 days
TEPH (Diesel) / Fuel ID / DRO	8015 mod	1-2oz wm	4°C	14 days
Total Metals	6010 / 7471	1-2oz wm	4°C	80/28 days
TRPH	418.1	1-4oz wm	4°C	28 days
TVPH (Gasoline)	8015 mod	1-2oz wm	4°C	14 days
VOA or Purgeable Halocarbons	8260 or 8010	1-2oz wm	4°C	14 days

(wm = wide-mouthed, glass jar)

Radiochemistry

Analyte	Method	Container	Preservative	Holding Time
Gross Alpha, Beta	EPA 900.0	1 - 1L poly	5mL 1:1 HNO ₂	180 days
Ra-226	SM7500 RaB mod	1 - 1L poly	5mL 1:1 HNO ₂	180 days
Ra-228	EPA Ra 05	1 - 1L poly	5mL 1:1 HNO ₃	180 days
Uranium	ASTM D2907	1 - 1L poly	5mL 1:1 HNO ₃	180 days
Radon	EPA 600 / 2-87 / 082	2 - 40mL vials	4°C	48 hours

USEFUL CONVERSIONS AND DEFINITIONS

Water related conversions:

1 ppm (liquid) = 1 mg/L = 1000 µg/L = 1000 ppb (liquid)

1 ppm (solid) = 1 mg/kg = 1000 µg/kg = 1000 ppb (solid)

1% = 10,000 ppm

1 gallon water = 231 cubic inches = 8.333 pounds

Water Hardness is given by the following formula:

Hardness, as mg/L CaCO₃ = 2.497 x Ca, mg/L + 4.115 x Mg, mg/L

1 mg/L CaCO₃ = 0.058 grains/Gallon (US)

Definitions

Metals, Analyte types

Dissolved Analyte – The concentration of analyte in an aqueous sample that will pass through a 0.45 µm membrane filter assembly prior to sample acidification.

Suspended Analyte – Those elements which are retained by a 0.45 µm membrane filter.

Total – The concentration determined on an unfiltered sample following vigorous digestion

Total Recoverable Analyte – The concentration of analyte determined either by "direct analysis" of an unfiltered, acid-preserved drinking water sample with turbidity of <1 NTU, or by analysis of the solution extract of a solid sample or an unfiltered aqueous sample following digestion by refluxing with hot dilute mineral acid(s) as specified in the method.

Potentially Dissolved Analyte – The concentration of analyte in an acidified aqueous sample that will pass through a 0.45 µm membrane filter after acidification for 8 – 9 hours. (This definition is only used by State of Colorado.)

TCLP – Toxicity Characterization Leaching Procedure (EPA SW-846 1311) – this is a leach procedure that is designed to give the mobile fraction of the metals in the sample and not the content of the metals in the sample. It is often incorrectly used to refer to the 8 RCRA metals that are most commonly extracted with this procedure.

Data Quality Objective (DQO) – Client-defined quality parameters, such as project-specific detection levels, RPD.

Field Reagent Blank (FRB) – An aliquot of reagent water or other blank matrix that is placed in a sample container in the laboratory and treated as a sample in all respects, including shipment to the sampling site, exposure to the sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the FRB is to determine if method analytes or other interferences are present in the field environment.

Laboratory control sample (LCS): A volume of reagent water spiked with known concentrations of analytes and carried through the preparation and analysis procedure as a sample. It is used to monitor loss/recovery values.

Laboratory Duplicates (LD1 and LD2) – Two aliquots of the same sample taken in the laboratory and analyzed separately with identical procedures. Analyses of LD1 and LD2 indicate precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

Laboratory Fortified Sample Matrix (LFM) – An aliquot of an environmental sample to which known quantities of the method analytes are added in the laboratory. The LFM is analyzed exactly like a sample, and its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentrations of the analytes in the sample matrix must be determined in a separate aliquot and the measured values in the LFM corrected for background concentrations.

Laboratory Reagent Blank (LRB) – An aliquot of reagent water or other blank matrices that are treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, and internal standards that are used with other samples. The LRB is used to determine if method analytes or other interferences are present in the laboratory environment, reagents, or apparatus

Method blank: A volume of reagent water processed through each sample preparation procedure.

Method detection limit (MDL) – The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample in a given matrix containing the analyte which has been processed through the preparative procedure.

Quality Control Sample (QCS) – A solution of method analytes of known concentrations which is used to fortify an aliquot of LRB or sample matrix. The QCS is obtained from a source external to the laboratory and different from the source of calibration standards. It is used to check either laboratory or instrument performance.

Sample holding time – The storage time allowed between sample collection and sample analysis when the designated preservation and storage techniques are employed.

Sensitivity – The slope of the analytical curve, *i.e.* functional relationship between emission intensity and concentration.

Water Sample – a sample taken from one of the following sources: drinking, surface, ground, storm runoff, industrial or domestic wastewater