BABCOCK Laboratories, Inc.

The Standard of Excellence for Over 100 Years

Schedule of Services

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Babcock Laboratories, Inc.
Terms & Conditions

COMPANY INFORMATION
Babcock Laboratories, Inc. (ESB) provides accurate analysis of drinking water, wastewater, groundwater, storm water, soils, hazardous materials and food and beverages. Founded in 1906, Babcock Labs has provided analytical services for over 100 years. ESB combines comprehensive environmental testing services with personalized service to handle all of your environmental testing needs. ESB retains the following certifications: California ELAP #2698 and ISO 17025:2005 (certificate number: 3232.01) through A2LA. For specific method and analyte certification information, click "Qualifications" on our website at www.babcocklabs.com.

PAYMENT TERMS AND CONDITIONS
Prepayment is required for all first time clients. Payment terms are net 30 days of invoice date, upon approved credit. A finance charge of 1.5%/mo (18% annually) will be applied to all unpaid balances 30 days past the due date. The minimum charge is $10. Delinquent accounts will be on a prepayment/C.O.D. basis only. Past Due under this contract is not dependent upon receipt of payment by clients' third party and/or user, and client is solely responsible for timely payment of all invoices not withstanding payment or non-payment by any said third party and/or user.

AVAILABLE SERVICES
Courier services, sample bottle kits, Chain of Custody forms, seals & labels.

REPORTING
A Standard QC package, when requested, may contain any combination of the following: Method Blank (MB), Lab Control Sample (LCS), Lab Control Sample Duplicate (LCSD), Matrix Spike (MS), Matrix Spike Duplicate (MSD), Sample Duplicate (DUP), and/or Surrogate (SURR). Electronic deliverables can be provided for a nominal fee.

SPECIAL NEEDS, CHARGES
An $80 minimum charge per submission applies. Extra charges may apply for rush analysis, special sample preparation, non-typical report format, or other non-typical customer requests or needs. Prices are based on the estimated quantities. Should the Scope of Work change, contact ESB for price verification. Additional charges may be assessed for Trip Blank analysis and samples requiring multiple dilutions due to client specific reporting requirements.

SAMPLE SUBMISSION
Before submitting a sample, new clients must fill out a New Client Information form.
Results only apply to the samples submitted.
When submitting a sample the following paperwork must be submitted.
Chain of Custody: Include sample identification, name and address, telephone and fax numbers, written instructions or list of analyses to be performed, email address, date and signature.
Price Quote: A copy of the official price quote (if obtained) must be submitted with the sample.
Samples must be submitted on ice and in the proper containers to help maintain the integrity of the sample.
All samples must be clearly labeled and identified. Instructions must be included with the sample, not separately.
ESB reserves the right to refuse samples at its discretion.
Sample turnaround time is 7-10 working days from the date of sample receipt. Standard turnaround time for hardcopy results is 5 working days from the date of verbal/email/fax results. RUSH analyses are available and should be arranged in advance.

SUBCONTRACTED ANALYSIS
Should instrumentation problems, special methods, or circumstances out of the laboratory's control occur, the project may be subcontracted to a State certified subcontract lab. Additional charges may be incurred. In addition, prices for subcontracted analysis are subject to change. Please contact your Project Manager prior to sample submittal to verify pricing and turnaround time.

SAMPLE DISPOSAL
If a sample is contaminated, either the client may take custody of the sample, or ESB will arrange for proper disposal and bill the client directly.

POLICIES
ESB 's liability for any service rendered or test performed on behalf of a client is limited to the amount ESB has been paid by the client for that particular test or service. ESB will not be liable for any consequential damages allegedly sustained by the client as a result of or in connection with a test or service performed by ESB. Under no circumstance shall ESB's liability arising from or in connection with the performance of a test or service exceed the amount it was paid for that test or service. Repeat Analyses: ESB may repeat analyses per the client's request. If the repeat analyses results confirm the original results, the client may be charged for the duplicate testing. ESB may at its sole discretion destroy any and all materials in conjunction with the services rendered pursuant to this contract after a period of seven (7) years from the date that services were last provided by ESB to the client. It is the client's responsibility to advise ESB of any pending litigation that may require retention of records.

Analytical Services
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Drinking Waters Wastewaters & Food Microbiology

Analysis

Drinking Waters
100 mL 24 Hour Presence/Absence, MMO/MUG (SM 9223B)
100 mL 24 Hour MMO/MUG with enumeration (QuantiTray-2000)
100 mL MTF, LTB/BGB (SM 9221C)
100 mL Presence/Absence Membrane Filtration
Fecal/*E.coli* Confirmation for MTF (SM 9221E&F)
Heterotrophic Plate Count ONLY (SM 9215B)

Wastewaters
3 Dilution MTF Coliform Test (SM 9221B)
3 Dilution MTF Fecal Test[1] (SM 9221E)
3 Dilution MTF *E.coli* Test[1] (Ambient Water ONLY; SM9221F)
E. *coli* 24 Hour MMO/MUG with enumeration (QuantiTray-2000; SM9223)
Heterotrophic Plate Count ONLY (SM 9215B)
Fecal Streptococcus & Enterococcus (SM 9230B)
Enterococcus 24 Hour MUG with enumeration (QuantiTray-2000)

Miscellaneous
Speciation of Enterobacteriaceae and other gram-negatives
Salmonella (Quantified)[2]
Iron Bacteria (Presence/Absence) (IRB-BART)[3]
Plate Count on Soils and Sludges (SM 9215B) (Std. Meth. 19th ed.)
Water Suitability
Inhibitory Residue

Bottled Beverage, Food Product & Environmental Swab Testing[4]
Indicator Bacteria
Lactic Acid Bacteria (CMMEF 4th Edition, Chapter 19.571)
Total Coliform/Generic *E. Coli* (AOAC 991.14) (Petrifilm)
APC/SPC (AOAC 990.12) (Petrifilm)
Yeast & Mold (AOAC 997.02) (Petrifilm)
Pathogen Bacteria
Listeria (AOAC 999.06) (Elfa by Mini VIDAS)[5]
Salmonella (AOAC 996.08) (Elfa by Mini VIDAS)[5]
E. Coli 0157:H7 (AOAC RI 060903) (Elfa by Mini VIDAS)[5]
Staphlococcus aureus (AOAC 2003-07) (Petrifilm)

[1]Must be performed in conjunction with coliform test.
[2]Subcontracted. Price is approximate.
[3]Iron Related Bacteria - Biological Activity Reaction Tests
[4]ISO 17025:2005 A2LA accredited. Certificate number: 3232.01
[5]Presumptive positive results require confirmation involving additional time and a fee of $100.00 per test.
Extra charges may apply for special sample preparation and swab testing. Contact laboratory for more information.

Drinking Waters & Wastewaters
Inorganic Analyses
Single Item List

Analysis
Alkalinity
(Includes: Hydroxide, Carbonate & Bicarbonate)
Boron
Bromate
Bromide
Calcium
Chlorate
Chloride
Chlorite
Color
Cyanide
Fluoride
Hardness (Includes Ca & Mg)
Magnesium
MBAS
Nitrogen
- Ammonium
- Nitrate
- Nitrite

Kjeldahl
- Organic (Kj-N - NH_4-N)
- Inorganic (NH_4+NO_3+NO_2 as N)

Odor
Oil & Grease (EPA 1664)
Oxygen
- Dissolved
- BOD (5 day)
- cBOD (5 day)
- COD

Analysis
Perchlorate IC/MS(MS)
Perchlorate (IC)
Petroleum Hydrocarbons (EPA 418.1)
pH
Phenols (Colorimetric)
Phenols (low level)
Phosphorous, ortho
Phosphorous, total
Potassium
Residues
- Total
- Dissolved
- Fixed
- Volatile

Settleable Solids
Residue, Suspended
- Total
- Volatile

Silica
Sodium
Specific Electrical Conductivity ($ECx10^6$)
Specific Gravity
Sulfate
Sulfide
TOC
Turbidity

Minimum Charge Per Submission **$ 80.00**

Drinking Waters & Wastewaters
Inorganic Analyses
Metals

Analysis	EPA Method (ICP)	EPA Method (ICP/MS)	Method (Other)
Aluminum (Al)	200.7	200.8	
Antimony (Sb)	200.7	200.8	
Arsenic (As)	200.7	200.8	
Barium (Ba)	200.7	200.8	
Beryllium (Be)	200.7	200.8	
Boron (B)	200.7	n/a	
Cadmium (Cd)	200.7	200.8	
Chromium (Cr)	200.7	200.8	
Chromium, Hexavalent (Cr^{+6})	n/a	n/a	SM 3500CrD**
Chromium, Hexavalent (Cr^{+6}) (low level)	n/a	n/a	EPA 218.6**
Cobalt (Co)	200.7	200.8	
Copper (Cu)	200.7	200.8	
Iron (Fe)	200.7	n/a	
Lead (Pb)	200.7	200.8	
Manganese (Mn)	200.7	200.8	
Mercury (Hg)	n/a	200.8	SM 3112B
Molybdenum (Mo)	200.7	200.8	
Nickel (Ni)	200.7	200.8	
Selenium (Se)	200.7	200.8	
Silver (Ag)	200.7	200.8	
Thallium (Tl)	200.7	200.8	
Tin (Sn)	200.7	n/a	
Titanium (Ti)	200.7	n/a	
Vanadium (V)	200.7	200.8	
Zinc (Zn)	200.7	200.8	

**Hexavalent Chromium can be performed by one of two methods: 1) Standard Methods SM 3500CrD with a reporting limit of 10 ppb, or 2) EPA 218.6 with a reporting limit of 1 ppb.

Drinking Waters
Organic Analyses
EPA Method Groupings

Analysis

EPA Method 524.2
- Volatile Halocarbons & Aromatics
  (California CDPH Regulated and Unregulated Compounds)
- Total Trihalomethanes
- Maximum Potential Trihalomethanes or Formation Potential THMS
- Oxygenates only

EPA Method 504.1
- EDB & DBCP

EPA Method 508
- Organochlorine Pesticides & PCB's
  (California CDPH Regulated and Unregulated Compounds)

EPA Method 515.3
- Chlorinated Herbicides & Pentachlorophenol
  (California CDPH Regulated and Unregulated Compounds)

EPA Method 525.2
- DEHP, DEHA and Benzo(a)pyrene
- Nitrogen & Phosphorus Pesticides
- Federal UCMR 3 List See Page 8

EPA Method 531.1
- N-Methyl Carbamates
  (California CDPH Regulated and Unregulated Compounds)

EPA Method 547*
- Glyphosate

EPA Method 548.1
- Endothall

SM 6251B
- Haloacetic Acids

CA DHS SRLB
- 1,2,3-Trichloropropane (1,2,3 - TCP)

*Subcontracted

Drinking Waters
California Title 22/SDWA
Complete Requirements[1]

Analysis

Microbiological (Presence Absence – Coliform)

General Mineral (Includes: Bicarbonate, Carbonate, Hydroxide, Total Alkalinity, Calcium, Chloride, Copper, MBAS, Iron, Potassium, Magnesium, Manganese, pH, Sodium, Sulfate, Specific Conductance, Total Dissolved Solids, Total Hardness and Zinc. Corrosivity [Aggressive and Langlier Index] can be calculated with this package at no additional cost.)

Inorganic Chemical (Includes: Aluminum, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Nitrate, Nitrite, Selenium, Silver, Fluoride, Antimony, Beryllium, Nickel, Thallium, Cyanide and Perchlorate.)

General Physical

Radiochemistry (Gross Alpha Only)*
Uranium

Asbestos*

EPA Organic Methods

524.2	Volatiles
504.1	EDB and DBCP
508	Chlorinated Pesticides & PCB's as DCP
515.3	Chlorinated Acid Herbicides
525.2	DEHP, DEHA, Benzo(a)Pyrene
525.2	Nitrogen & Phosphorus Pesticides
531.1	Carbamates
547	Glyphosate
548.1	Endothall
549.1	Diquat*
1613	Dioxin (2,3,7,8 TCDD)*

[1] Note: Individual requirements vary according to vulnerability.
*Subcontracted. Price is approximate.

Drinking Waters
California Title 21/CDPH Food & Drug Branch
Complete Requirements[1]

Analysis

Group I Physical (Includes: Color, Odor, Turbidity and Total Dissolved Solids)

Group II Chemical Substance 1 (Includes: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chloride, Chromium, Copper, Cyanide, Fluoride, Iron, Lead, Manganese, Mercury, Nickel, Nitrate-N, Nitrite-N, Phenols, Selenium, Silver, Sulfate, Thallium and Zinc)

Group III Chemical Substance 2 (Includes: EPA Method 524.2 for VOCs)

Group IV Chemical Substance 3 (Includes: Non-Volatile SOCs listed below)

EPA 504.1	EDB and DBCP
EPA 508	Chlorinated Pesticides & PCB's as DCP
EPA 515.3	Chlorinated Acid Herbicides
EPA 525.2	DEHP, DEHA, Benzo(a)Pyrene
EPA 525.2	Nitrogen & Phosphorus Pesticides
EPA 531.1	Carbamates
EPA 547	Glyphosate
EPA 548.1	Endothall
EPA 549.1	Diquat*
EPA 1613	Dioxin (2,3,7,8 TCDD)

Group V Radioactivity[2] (Includes: Gross Alpha and Beta particle activity and Radium 228)

Group VI Bacteriological (Presence Absence - Coliform)

Group VII Disinfection Byproducts and Residual Disinfectants[3]
(Includes: Bromate, Chlorite, HAAs, Chloramine, Chlorine, Chlorine Dioxide)

[1] Note: Individual requirements vary according to vulnerability (see CDPH website).
[2] If gross alpha is <5pCi/L, Radium 226 does not have to be analyzed. Determine only Radium 228. If gross alpha is <15pCi/L, uranium does not have to be analyzed. If these tests are required additional costs will apply.
[3] Residual disinfectants and DBP's: (1) Source Water – Firms that do not use a public water system as the source of their water and whose source water has not been treated with a chlorine-based disinfectant or ozone, do not have to test their source water for residual disinfectants and DBP's. Firms that do not use a public water system as the source of their water but whose source water has been treated with a chlorine-based disinfectant or ozone, must test their source water for the residual disinfectants and the DBP's. (2) Product water (Bottled Water) – Test annually for residual disinfectants and DBP's.

*Subcontracted. Price is approximate.

Drinking Waters
Disinfection By-Products and Surrogate Parameters

Analysis	Method
UV254	SM 5910
Total Organic Carbon	SM 5310B
Total Organic Halogen	SM 5320B*
Inorganic DBPs:	EPA 300.1
Chlorite	
Bromate	
Chlorate	
Bromide	
Haloacetic Acids:	SM 6251B
Monochloroacetic Acid	
Monobromoacetic Acid	
Dichloroacetic Acid	
Trichloroacetic Acid	
Bromochloroacetic Acid	
Dibromoacetic Acid	
Trihalomethanes:	EPA 524.2
Chloroform	
Bromodichloromethane	
Dibromochloromethane	
Bromoform	

*Subcontracted. Price is approximate.

Drinking Waters

Federal Unregulated Contaminant Monitoring Rule (UCMR 4)*

Analysis	Method
Assessment Monitoring 1	
Metals (Ge, Mn)	EPA 200.8
Pesticides & Pesticide By-Product (9 analytes)	EPA 525.3
Alcohols (3 analytes)	EPA 541
Additional Semi-Volatile Compounds (3 analytes)	EPA 530
Assessment Monitoring 2	
Brominated Haloacetic Acid Groups	EPA 552.3
Assessment Monitoring 3	
Cyanotoxins (Microcystins)	EPA 544, 545, & 546
Monitoring Cmpounds	
Total Organic Carbon	SM 5310B
Bromide	EPA 300.1

*Please call laboratory for special sampling, preservation and handling of samples.

Wastewaters
Organic Analyses
EPA Method Groupings

Analysis

Volatiles

EPA Method 624

Semi-Volatiles

EPA Method 625
Base Neutral & Acid Extractables
(2,3,7,8-TCDD Screening is included when requested)

Pesticides and Herbicides

EPA Method 608
Pesticides and PCB's
EPA Method 515.3
Chlorophenoxy Herbicides
(Includes EPA Method 615 and 1658 compounds)
EPA Method 8141
Organophosphorus Pesticides
(Includes EPA Method 614, 622, and 1657 compounds)

Note: Modifications used when appropriate, e.g., use of capillary columns and alternate detectors.

Additional Services

Sampling Services

Composite Sampling*

Sampler Rental (per 24 hour period)
Flow Meter (per 24 hour period)

Hourly Sampling Charge

Minimum charge is $150.00 (2 hours)
Charges greater than the minimum are pro-rated to the half hour.
Distribution System re-samples will be charged a minimum rate of 4 hours.

Groundwater Monitoring

Submersible 2" *Grundfos* Pump, 100'
120 V Generator (gasoline; recoil) (w/o fuel)
240 V Generator (gasoline; electric start) (w/o fuel)
Electronic Depth Sounder

Please note: Sampling equipment is not available as a separate rental.

On-Site Testing

Chlorine Residual (per sample)
Electrical Conductivity, pH, & Temperature (per location)
Field Filtration & Preservation (per sample)

Shipping (per package, normal ground 3-5 day)

Archive Retrieval

Custom Electronic Deliverables

Sample Disposal (for samples requiring special disposal, i.e. hazardous)

Sample Storage (for samples requiring storage for more than 6 weeks)

Soils, Solids, Oils, Sludges & Hazardous Wastes
Assorted Analyses
Characteristics & Sample Preparation

Analysis	Method
Characteristics	
Ignitability, Flash Point	EPA 1010
Free Liquids Test	EPA 9095/1311
pH	EPA 9040/9045
Specific Conductance (liquids only)	EPA 9050
Organic Matter (OM) - Solids	Loss on Ignition
	Dichromate Reduction
Total Organic Carbon (TOC)	Combustion/IR
Total Organic Carbon (TOC) – Groundwater	EPA 9060/SM 5310B
Water Content (solids)	Gravimetric
Soil Corrosion (pH, Redox, Sat. Res., Sulfide)	
Sample Preparation (Extracts, Digestions & Clean Up)	
Total Acid Digest or Dry Ash (metals)	EPA 3000 series
Bomb Combustion (anion determination)	EPA 5050
W.E.T. (citrate)	22 CCR 66261.24
W.E.T. (water for Cr^{+6})	22 CCR 66261.24
TCLP (non-volatiles)	EPA 1311
TCLP (volatiles-ZHE)	EPA 1311
Organic Extraction & Clean-up	EPA 3500 & 3600
Water Extract	1:10 Ratio
Inorganic Non-Metals & Bacteriology	
Anions (Cl, NO_3, SO_4)	EPA 9056/300.0
Chlorine, Total (in oils)	EPA 9076
Coliform, Total	SM 9221B
Coliform, Fecal (in addition Total Coliform)	SM 9221E
Cyanide, Total	EPA 9012A
Cyanide, Amenable to chlorination	EPA 9012A
Fluoride, Total	EPA 340.2/9214
Perchlorate (soils only)	EPA 9058
Perchlorate by IC/MS(MS)	EPA 6860
Sulfide, Water Extractable	SM 4500-52-D

Soils, Solids, Oils, Sludges & Hazardous Wastes
Inorganic Analyses
Metals

Analysis		EPA Method (ICP)	EPA Method (ICPMS)	EPA Method (Other)
Metals				
	Aluminum (Al)	6010	6020	
	Antimony (Sb)	6010	6020	
	Arsenic (As)	6010	6020	
	Barium (Ba)	6010	6020	
	Beryllium (Be)	6010	6020	
	Boron (B)	6010	n/a	
	Cadmium (Cd)	6010	6020	
	Chromium (Cr)	6010	6020	
	Chromium, hexavalent (Cr^{+6})	n/a	n/a	7199
	Chromium, hexavalent (Cr^{+6})	n/a	n/a	7196
	Cobalt (Co)	6010	6020	
	Copper (Cu)	6010	6020	
	Iron (Fe)	6010	n/a	
	Lead (Pb)	6010	6020	
	Manganese (Mn)	6010	6020	
	Mercury (Hg)	n/a	6020	7470/7471
	Molybdenum (Mo)	6010	6020	
	Nickel (Ni)	6010	6020	
	Selenium (Se)	6010	6020	
	Silver (Ag)	6010	6020	
	Thallium (Tl)	6010	6020	
	Tin (Sn)	6010	6020	
	Vanadium (V)	6010	6020	
	Zinc (Zn)	6010	6020	

Soils, Solids, Oils, Sludges, & Hazardous Wastes
Organic Analyses
Miscellaneous EPA Methods

Analysis	Method	
General Organics		
Oil & Grease, Total Recoverable	EPA 9070/9071	
Phenolics, total	EPA 9066	
TOC		(See Page 11)
Chromatographic Organics		
EDB and DBCP	EPA 8011	
Volatile Organics (GC/MS)	EPA 8260	
Volatile Organics *listed in* EPA Methods: 8015, 8030 and 8031	EPA 8260	See Appendix B
Volatile Organics (Oxygenates only)	EPA 8260	
Semi-Volatile Organics	EPA 8270*	
Semi-Volatile Organics *listed in* EPA 8000 series methods	EPA 8270	See Appendix B
Pesticides & Arochlors		
Organochlorine (PCB's *not* included)	EPA 8081	
Polychlorinated Biphenyls (PCB's)	EPA 8082	
Organochlorine Pesticides plus PCB's	EPA 8081 & 8082	
Organophosphorus Pesticides	EPA 8141/8270	
Chlorophenoxy Herbicides	EPA 8151	

Note: All prices include secondary column or GC/MS confirmation, when required.
Travel blanks & field equipment blanks are charged as samples.

*Target analyte list to be supplied by client. $375.00 price is for EPA priority pollutant list (not including 2, 3, 7, 8 -TCDD, chlorinated Pesticides & PCB's).

Soils, Solids, Oils, Sludges & Hazardous Wastes
22 CCR W.E.T.
Extractions & Analyses

Analysis

Non-Volatiles Extraction (Water)

Hexavalent Chromium (Cr^{+6})

Non-Volatiles Extraction (Citrate)

Metals:

Antimony	Cobalt	Selenium
Arsenic	Copper	Silver
Barium	Lead	Thallium
Beryllium	Mercury	Vanadium
Cadmium	Molybdenum	Zinc
Chromium	Nickel	

EPA Method 8081/8082

Aldrin	DDT	Methoxychlor
Chlordane	Dieldrin	PCB's
DDD	Endrin	Toxaphene
DDE	Heptachlor	

EPA Method 8151

2,4-D and Silvex (2,4,5, TP)

EPA Method 8270

Kepone, Mirex, Pentachlorophenol & 2, 3, 7, 8-TCDD
(Dioxin Scan per EPA 625)

EPA Method 8260

TCE

EPA Method 9214

Fluoride

TOTAL CCR W.E.T. Analysis
(Excluding Asbestos & Dioxin Confirmation)

Asbestos & 2,3,7,8-TCDD (Dioxin Confirmation by EPA Method 8280)
Samples are sent to a DHS approved laboratory.

Soils, Solids, Oils, Sludges & Hazardous Wastes
40 CFR T.C.L.P.
Extractions & Analyses

Analysis

Non-Volatiles Extraction

Metals:

Arsenic	Chromium	Selenium
Barium	Lead	Silver
Cadmium	Mercury	

EPA Method 8081

Chlordane	Heptachlor Epoxide	Methoxychlor
Endrin	Lindane	Toxaphene
Heptachlor		

EPA Method 8151

2,4-D and Silvex

EPA Method 8270

p, m & o-Cresols	Hexachloroethane	Pyridine
2, 4-Dinitrotoluene	Nitrobenzene	2, 4, 5-Trichlorophenol
Hexachlorobenzene	Pentachlorophenol	2, 4, 6-Trichlorophenol
Hexachloro-1, 3-Butadiene		

Volatiles Extraction (ZHE) Zero Headspace

EPA Method 8260

Benzene	1, 4-Dichlorobenzene	PCE
Carbon Tetrachloride	1, 2-Dichloroethane	TCE
Chlorobenzene	1, 1-Dichloroethylene	Vinyl Chloride
Chloroform	MEK	

Soils
Fuel Tank Removal
Miscellaneous & EPA Methods

Analysis	Method
Total Petroleum Hydrocarbons (TPH)	
Total Recoverable Petroleum Hydrocarbons	Spectrophotometric
Total Volatile Hydrocarbons (EPA 8015)	GC/FID
Gasoline Range Organics (GRO) only	
Total Semi-Volatile Hydrocarbons (EPA 8015)	GC/FID
Diesel Range Organics (DRO) only	
EPA Method 8260	
Benzene, Toluene, Xylenes & Ethylbenzene (B-T-X-E and MTBE)	GC/MS
Total Lead (Pb)	Acid Digest/ICP-MS
Extractable Lead (Pb)/22 CCR §66261 (Appendix II)	W.E.T./ICP-MS

Appendix A

Groundwaters / Monitoring Wells

Note: Groundwater monitoring programs are often project and program specific. Depending on the lead regulatory authority (i.e. DTSC, RWQCB, USEPA, etc.), project plans may require a mixture of various analytical protocol. Monitoring wells usually provide aqueous samples with matrices similar to many drinking waters and wastewaters and, as such, are priced accordingly.

Analytes of Concern	**Analytical Methods required found in:**	**Analyte found on page(s)**
Anions and cations, residues, nutrients, demand constituents	SW 846; Drinking water methods; wastewater methods	2
Metals	SW 846 (6000 and 7000 series); Water and wastewater methods (200 series)	3
Organics	500 series, 600 series, 8000 series	Appendix B
TOC	SM 5310B	2 and 11
1,4 Dioxane	8270M	
NDMA	8270M or 521	

Appendix B
Methods for Organic Determinations
Numerical Listings

Method	Analyte	ESB Certified Method Used as Approved Alternative		Cross-Ref. Page(s)
314.0	Perchlorate			2
314.1	Perchlorate	314.0		2
331.0	Perchlorate by HPLC/MS/MS	332.0		2
332.0	Perchlorate by IC/MS(MS)			2
415.1	TOC	SM 5310B		2
418.1	Petroleum Hydrocarbons by IR			2, 16
420.1	Phenolics			2
420.2	Phenolics (low level)			2
425.1	MBAS	SM 5540C		2
450.1	TOX	SM 5320B	Upon Request*	--
501.3	Total THM's	524.2		4, 7
502.2	Volatiles by GC	524.2		4, 5
504.1	EDB, DBCP			4, 5, 6
505	Chlorinated Pesticides & PCB's	508		4
506	Phthalates & Adipates	525.2		4
507	N-P Pesticides	525.2		4, 5, 6
508	Chlorinated Pesticides & PCB's			4, 5, 6
508A	PCB's as DCB	508 (as screen)		4, 5, 6
510.1	Maximum Potential THM's	524.2		4
515.1	Chlorinated Herbicides	515.3		4, 5, 6
515.2	Chlorinated Herbicides	515.3		4, 5, 6
515.3	Chlorinated Herbicides	515.3		4, 5, 6
515.4	Chlorinated Herbicides	513.3		4, 5, 6
521	Nitrosamines			8
524.2	Volatiles by GC/MS			4, 5
525.2	Semivolatiles by GC/MS			4, 5, 6
527	Pesticides and Flame Retardants			8
529	Explosives			8
531.1	Carbamates			4, 5, 6
535	Acetamide Herbicide Degradates			8
547	Glyphosate			4, 5, 6
548.1	Endothall			4, 5, 6
549.1	Diquat & Paraquat*			5
550/550.1	PAH's	525.2		4
551.1	Chlorinated DBP's*			--
552.1	Haloacetic DBP's	SM 6251B		4, 7
555	Chlorinated Herbicides	515.3		4, 5, 6
601	Chlorinated Volatiles	624		9
602	Aromatic Volatiles	624		9

*Subcontracted.

Appendix B
Methods for Organic Determinations
Numerical Listings

Method	Analytes	ESB Certified Method Used as Approved Alternative		Cross-Ref. Page(s)
603	Acrolein & Acrylonitrile	624		9
604	Phenols by GC	625		9
605	Benzidine	625		9
606	Phthalates	625		9
607	Nitrosoamines	625		9
608	Chlorinated Pesticides & PCB's			9
608.1/608.2	Misc. Chlorinated Pesticides	608		9
609	Nitroaromatics & Isophorone	625		9
610	PAH's	625		9
611	Haloethers	625		9
612	Chlorinated Hydrocarbons	625		9
613	2,3,7,8-TCDD (Dioxin)*			--
614	Misc, O-P Pesticides	525.2		--
615	Chlorinated Herbicides	515.3		9
617	Misc. Chlorinated Pesticides	608		9
619	Triazine Pesticides	525.2		--
622	Misc. O-P Pesticides	525.2		--
624	Volatiles by GC/MS			9
625	Semivolatiles by GC/MS			9
630/630.1	Dithiocarbamates		Upon Request*	--
632/632.1	Carbamate Pesticides by HPLC		Upon Request*	--
633/633.1	Organonitrogen Pesticides	525.2		--
1311	TCLP-ZHE (Extraction only)			11, 15
1311	TCLP Bottle (Extraction only)			11, 15
1613	Dioxins (2,3,7,8-TCDD)*			5, 6
1624	Volatiles by Isotope MS	624		--
1625	Semivolatiles by Isotope MS	625		--
1658	Chlorophenoxy Herbicides	515.3		9
1660	Pyrethins, Fenvalerate		Upon Request	--
1664	TPH/Oil & Grease			2
3510	Sep. Funnel Extraction		N/C**	11
3520	Cont. Liq./Liq. Extraction		N/C**	11
3540	Soxhlet Extraction		N/C**	11
3541	Automated Soxhlet	3540	N/C**	11
3545	Accelerated Extraction	3540	N/C**	11

*Subcontracted.
**N/C = No charge; included with determinative method

Appendix B
Methods for Organic Determinations
Numerical Listings

Method	Analytes	ESB Certified Method Used as Approved Alternative	Price	Cross-Ref. Page(s)
3550	Ultrasonic Extraction		N/C**	11
3580	Waste Dilution		N/C**	11
3610/3611	Alumina Clean-up		N/C**	11
3620	Florisil Clean-up		N/C**	11
3630	Silica Gel Clean-up		N/C**	11
3650	Acid-Base Clean-up		N/C**	11
3660	Sulfur Clean-up		N/C**	11
3665	Sulfuric Acid/Permanganate Clean-up		N/C**	11
3810	Headspace		N/C	--
3820	Hexadecane Extraction		N/C	--
5030/5035	Purge & Trap		N/C	--
5040/5041	Sorbant Cartridges		Upon Request*	--
5050	Bomb Preparation			11
5310B (std.meth.)	TOC			7
5320B (std.meth.)	TOX		Upon Request*	--
5910 (std.meth.)	UV 254 Absorbance			7
6251B (std.meth.)	Haloacetic DBP's			4, 6, 7
6610 (std.meth.)	Carbamates	531.1	*	4, 5, 6
6651 (std.meth.)	Glyphosate	547	*	4, 5, 6
6860	Perchlorate by IC/MS/MS			2, 11
8010	Halogenated Volatiles	8260		13
8011	EDB & DBCP			13
8015	Non-Halogenated Volatiles	8260		13
8015-"Modified"	Petroleum Hydrocarbons	ESB-SOP's	Various	16
8020	Aromatic Volatiles	8260		13
8021	Volatiles by GC	8260		13
8030	Acrolein & Acrylonitrile	8260		13
8031	Acrylonitrile	8260		13
8040/8041	Phenols by GC	8270		13
8060/8061	Phthalates	8270		13
8070	Nitrosamines	8270		13
8080	Chlorinated Pesticides & PCB's	8081& 8082		13, 14
8081	Chlorinated Pesticides			13
8082	PCB's			13
8090/8091	Nitroaromatics & Ketones	8270		13
8100	PAH's	8270		13
8110/8011	Haloethers	8270		13
8120/8121	Chlorinated Hydrocarbons	8270		13

*Subcontracted.
**N/C = No charge; included with determinative method

Appendix B
Methods for Organic Determinations
Numerical Listings

Method	Analytes	ESB Certified Method Used as Approved Alternative	Price	Cross-Ref. Page(s)
8140	O-P Pesticides	8141		13
8141	O-P Pesticides			13
8150	Chlorinated Herbicides	8151		13, 15
8151	Chlorinated Herbicides			13
8240	Volatiles by GC/MS	8260		13
8250	Semivolatiles by GC/MS	8270		13
8260	Volatiles by GC/MS			13, 14, 15, 16
9058	Perchlorate on Soils			11
8270	Semivolatiles by GC/MS			13, 14, 15
8280	Dioxins & Furans		Upon Request*	14
8290	Dioxins & Furans		Upon Request*	--
8310	PAH's	8270		13
8315	Formaldehyde (Aldehydes)		Upon Request*	--
8318	Carbamates		Upon Request*	--
9020	TOX	SM 5320B	Upon Request*	--
9060	TOC	SM 5310B		11
9065/9066	Phenolics			13
9070	Total Recoverable O & G			13
9071	O & G in Sludge			13
9076	Total Chlorine in Oil			11

*Subcontracted.

Notes:

1) The method references listed in this appendix refer to the latest promulgated revisions, even though the SW 846 method numbers herein do not include the appropriate letter suffix (for brevity and convenience).

2) Babcock Labs, Inc. will utilize the methods listed in the column entitled "ESB Certified Method Used as Approved Alternative" whenever the alternative method appears in this appendix. If this alternate method will not meet your specific project requirements, please let us know so we can arrange for the protocol you require.

3) The method numbers listed in this appendix are primarily EPA methods. The remaining methods are found in **Standard Methods for the Examination of Water and Wastewater**, 20th and 21st Editions. (except where noted). If you require a specific analytical method not referenced in this appendix (i.e., other EPA or APHA/AWWA methods or any NIOSH, ASTM, CARB, etc. methods) please inquire.

Appendix C
Sample Containers, Preservation Techniques, and Holding Times For Aqueous Matrices

Bacteriological Analyses

Determination	Method	Container/ Min. Volume (mL)	Preservative	Holding Time[1]
Coliform, Total	SM9221B,SM9223	P,G/Sterile/100	<10°C[12]	6hrsWW/ 8hrsSW/ 30hrsDW
Coliform, Fecal	SM9221E,SM9223	P,G/Sterile/100	<10°C[12]	6hrsWW/ 8hrsSW/ 30hrsDW
Enterococcus	SM9230B	P,G/Sterile/100	<10°C[12]	6hrsWW/ 8hrsSW/ 30hrsDW
	ASTM D650399	P,G/Sterile/100	<10°C[12]	6hrsWW/ 8hrsSW/ 30hrsDW
Heterotrophic Plate Ct.	SM9215B	P,G/Sterile/100	<10°C[12]	6hrsWW/ 8hrsSW/ 30hrsDW
Streptococcus, Fecal	SM9230B	P,G/Sterile/100	<10°C[12]	6hrsWW/ 8hrsSW/ 30hrsDW

Inorganic and Wet Chemistry Analyses

Determination	Method	Container/ Min. Volume (mL)	Preservative	Holding Time[1]
Alkalinity*	SM2320B	P,G/500	≤6°C	14 days
Ammonia	SM4500NH3H	P,G/100	≤6°C,H_2S0_4	28 days
Asbestos	100.2	P/1000	≤6°C	48 hours[13]
BOD*	SM5210B	P,G/1000	≤6°C	48 hours
Boron	200.7	P/500	$HN0_3$[8]	6 months
Bromate	300.1	P,G/100	≤6°C,EDA	28 days
Bromide*	300.1	P,G/100	None	28 days
Cations(Ca,Mg,Na,K)	200.7	P,G/500	$HN0_3$[8]	6 months
COD	SM5220D	P,G/100	≤6°C,H_2S0_4	28 days
Chloride*	300.0	P,G/100	None	28 days
Chlorine demand	SM2350B	P,G/1000	None	15 minutes
Chlorine dioxide*	SM4500ClO_2D	P,G/100	None	15 minutes
Chlorine, residual*	SM4500ClG	P,G/100	None	15 minutes
Chlorate	300.1	P,G/100	≤6°C,EDA	28 days
Chlorite	300.1	P,G/100	≤6°C,EDA	14 days
Chromium-Hexavalent	SM3500CrD	P,G/100	≤6°C,NH_4Buffer[15]	28 days
Chromium-Hex.(low level)	218.6	P,G/500	≤6°C,NH_4Buffer[15]	28 days
	7199	P,G/500	≤6°C	24 hours
Color*	SM2120B	P,G/100	≤6°C	48 hours
Cyanide	SM4500CN CE,G	P,G/250	≤6°C[6],NaOH[14]	14 days
Dissolved Oxygen	SM4500 O C	G/300	Fixed on site	8 hours
Flashpoint	1010	G/500	None	Not Specified
Fluoride*	SM4500 FC	P/100	None	28 days
Hardness (Total)	200.7	P,G/500	$HN0_3$[8]	6 months
Metals ICP (inc. Cations)	200.7,6010B	P,G/500	$HN0_3$[8]	6 months
Metals ICPMS	200.8,6020	P,G/500	$HN0_3$[8]	6 months
Mercury	7470,7471,200.8	P,G/500	$HN0_3$[8]	28 days
	SM3112B	P,G/500	$HN0_3$[8]	28 days
Nitrate*	300.0	P,G/100	≤6°C	48 hours
Nitrite*	SM4500NO_2B	P,G/100	≤6°C	48 hours
Nitrogen–Total Kjeldahl	351.2	P,G/500	≤6°C,H_2S0_4	28 days
Odor	SM2150B	P,G/100	≤6°C	48 hours
Oil & Grease	1664	G-A/500[10]	≤6°C,H_2S0_4	28 days
PCBSA*	300.0	P,G/100	None	28 days
Perchlorate*	314	P,G/100	≤6°C	28 days

Appendix C
Sample Containers, Preservation Techniques, and Holding Times For Aqueous Matrices

Inorganic and Wet Chemistry Analyses

Determination	Method	Container/ Min. Volume (mL)	Preservative	Holding Time[1]
Perchlorate (low level)	332.0/6860	P,G/100 sterile	≤6°C	28 days
pH*	SM4500H+B	P,G/100	None	15 minutes
Phenols	420.4	G-A/250	≤6°C[6],H_2S0_4	28 days
Phenols (low level)	SM5530C	G-A/1000	≤6°C,H_2S0_4	28 days
Phosphates – Ortho*	SM4500P E	P,G/100	≤6°C	48 hours
Phosphorus, Total (as P)	SM4500P E	P,G/100	≤6°C,H_2S0_4	28 days
Silica, Reactive*	SM4500 SiO_2C	P/500	≤6°C	28 days
Silica, Total	200.7	P/500	$HN0_3$[8]	6 months
Solids-Dissolved-TDS*	SM2540C	P,G/500	≤6°C	7 days
Solids-Suspended-TSS*	SM2540D	P,G/500	≤6°C	7 days
Solids-Total*	SM2540B	P,G/500	≤6°C	7 days
Solids-Settleable Solids	SM2540F	P,G/2000	≤6°C	48 hours
Solids-Volatile*	160.4	P,G/500	≤6°C	7 days
Specific Conductance-EC*	SM2510B	P,G/100	≤6°C	28 days
Sulfate*	300.0	P,G/100	≤6°C	28 days
Sulfide, dissolved	SM4500S D	P,G/100[9]	≤6°C,zero headspace	ASAP/7 floc -ZnAc
Sulfide, total	SM4500S D	P,G/100	≤6°C,NaOH,ZnAcetate	7 days
Surfactants (MBAS)*	SM5540C	P,G/500	≤6°C	48 hours
Turbidity*	SM2130B	P,G/100	≤6°C	48 hours
Uranium	200.8	P,G/500	$HN0_3$[8]	6 months
UV-254	SM[20th]5910B	G-TLC-A/250	≤6°C	2 days
Volatile Acids	SM5560C	P,G/500	≤6°C	7 days

Organic Analyses

Determination	Method	Container/ Min. Volume (mL)	Preservative	Holding Time[1] Extraction/Analysis
Semivolatiles, N.P. Pest.	525	G-TLC-A/1000	≤6°C [3],HCl	14/30 days
Base/Neutrals/Acid	625	G-TLC-A/1000	≤6°C [3]	7/40 days
	8270	G-TLC-A/1000	≤6°C [3]	7/40 days
Carbamates	531.1	VOA-G-A/3 x 40 vials	≤6°C,$Na_2S_2O_3$,MCAA[4]	28 days
Chlorinated pests/PCBs	508	G-TLC-A/1000	≤6°C [3]	7/14 days[7]
Chlorinated pesticides	608,8081	G-TLC-A/1000	≤6°C [3]	7/40 days[7]
Polychlorinated Biphenyls	608	G-TLC-A/1000	≤6°C	1year/1year
	8082	G-TLC-A/1000	≤6°C	7/40 days
Chlorinated Herbicides	515.3	G-TLC-A/1000	≤6°C [3]	14/14 days
	8151	G-TLC-A/1000	≤6°C [3]	7/40 days
Diesel Range Organics	8015B	VOA-G/4 x 40 vials, TB[2]	≤6°C,HCl or H_2S0_4	14 days recom.
Dioxins	1613B	G-A/1000	≤6°C [3]	30 days
Diquat	549.1	P/1000	≤6°C [3]	7 days for ext[13]
EDB and DBCP	504,8011	VOA-G-A/3 x 40 vials	≤6°C, Na2S2O3	14 days
Endothall	548.1	G-A/500	≤6°C [3]	7/14 days
Ethylene Glycol	GCFID	G-TLC-A/1000	≤6°C	40 days
Gasoline Range Orgs.	8015B	VOA-G/4 x 40 vials	≤6°C,HCl	14 days recom.
Glyphosate	547	VOA-G/3 x 40 vials	≤6°C, Na2S2O3	14 days[7]
Haloacetic Acids	SM[19th] 6251B	VOA-G/4 x 40 vials	≤6°C,NH_4Cl	9/21 days
Organophos. Pests.	8141	G-TLC-A/1000	≤6°C [3]	7/40 days[7]

Appendix C
Sample Containers, Preservation Techniques, and Holding Times For Aqueous Matrices

Organic Analyses

Determination	Method	Container/ Min. Volume (mL)	Preservative	Holding Time[1] Extraction/Analysis
Total Organic Carbon	SM5310B	P,G/4 x 40 vials	$\leq$6°C,H_2S0_4	28 days
Total Organic Halogen	SM[20th]5320B	G-TLC-A/250	$\leq$6°C[3],H_2S0_4	28 days
TPH	418.1	G-TLC-A/1000	$\leq$6°C,H_2S0_4	28 days
Trihalomethanes	524.2	VOA-G-A/4 x 40 vials	$\leq$6°C,NH_4Cl	14 days
Volatile Organics	524.2,624,8260	VOA-G/4 x 40 vials,TB[2]	$\leq$6°C,HCl[3]	14 days

Radiochemistry Analyses

Determination	Method	Container/ Min. Volume (mL)	Preservative	Holding Time[1] Extraction/Analysis
Gross Alpha	900.0,9310	P,G/1000	$HN0_3$[5]	6 months
Gross Beta	900.0,9310	P,G/1000	$HN0_3$[5]	6 months
Uranium	908.0	P,G/1000	$HN0_3$[5]	6 months
Radium 226	903.1	P,G/1000	$HN0_3$[5]	6 months
Radium 228	904.0,9320	P,G/2000	$HN0_3$[5]	6 months
Radon	913	G-TLC-A /2 x 250[11]	$\leq$6°C	4 days
Strontium 90	905.0	P,G/1000	$HN0_3$[5]	6 months
Tritium	906.0	G/1000	None	6 months

Notes:
G=Glass, P=Polyethylene (plastic), G-A=Amber Glass, VOA=Vial with Teflon-lined septum – zero head space, G-TLC-A=Amber Glass with Teflon-lined cap, Recom.=recommended, DW = drinking water, SW = source water, WW = wastewater, °C = degrees Celcius, floc = flocculate, EDA = Ethylenediamine.

SM refers to Standard Methods for the Examination of Water and Wastes, 18th Edition unless otherwise noted. All other methods referenced are EPA numbers.

* All of these analyses can be performed out of one 1/2 gallon plastic container.
1. Holding times per 40 CFR 141 for drinking waters, and CFR 136.3 for wastewaters.
2. Travel Blank (also preserved with HCl).
3. If Chlorine Residual is present, sodium thiosulfate or sodium sulfite (525) is needed to neutralize free chlorine. Dechlorinator must be added prior to acidification. If it is not added at the time of collection, dechlorinator is added to nonvolatile samples (except 549) at the time of extraction to ensure that residual chlorine is not present. Consult method.
4. Monochloracetic acid (MCAA) buffer (pH3) is added at the ratio of 1.2 mL per 40 mL sample.
5. Sample preserved at lab after Electrical Conductivity is checked.
6. Preserved sample is screened for chlorine as necessary and treated at lab. See SOP A06 for more details.
7. See method exceptions.
8. Sample can be preserved at lab in its original container and must be held $\geq$ 24 hrs. prior to analysis.
9. Collect grab sample in 1 quart plastic container, fill completely, eliminating all headspace.
10. Grab sample only.
11. Consult laboratory for special instructions.
12. With Sodium thiosulfate
13. Analysis is subbed out. Please allow extra time for short holding time analyses.
14. Client submits unpreserved sample which is screened for sulfide and chlorine as necessary and preserved to pH>12 with NaOH upon receipt to the laboratory. See SOP A06 for more details.
15. Client submits unpreserved sample which is filtered as necessary and preserved by the laboratory to pH 9.3-9.7 with NH_4 buffer within 24 hours.

Basic Sampling Guidelines

A. Always utilize proper sampling containers and preservatives.
B. For organic analytes, all bottles should have Teflon lined caps, vials should have Teflon lined septa.
C. Soil samples are typically collected in brass or steel tubes and wide mouth jars (500ml) with Teflon-lined caps. Sludges should be collected in wide mouth jars, not brass or steel tubes. Store at≤6°C
D. Aqueous samples for volatile analyses should not have head space between the sample matrix and septum, or bubbles within the sample.
E. Samples requiring organic analyses should never be handled with plastic implements, latex gloves, or stored in plastic containers. Glass is the only acceptable container (except EPA 549).
F. Always use trip blanks when samples require volatile analyses. Fill completely, eliminate all headspace.
G. Keep samples isolated from all possible sources of contamination (i.e., gasoline refueling operations, solvents, paints, lacquers, and adhesives).
H. Always complete a Chain-of-Custody form.
I. Use blue ice packs in coolers when possible.
J. Deliver samples directly to the laboratory as soon as possible.