



**E.S.BABCOCK**& Sons, Inc.

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Environmental Laboratories *est. 1906*

## **Schedule of Services**

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## **Edward S. Babcock & Sons, Inc. Environmental Laboratories Terms & Conditions**

### **COMPANY INFORMATION**

E.S. Babcock & Sons, Inc. (ESB) provides accurate analysis of drinking water, wastewater, groundwater, storm water, soils and hazardous materials. 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: NELAP #02101CA, California ELAP #2698. For specific method and analyte certification information, click "Qualifications" on our website at [www.babcocklabs.com](http://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 notwithstanding 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**

A \$75 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.

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## **Drinking Waters & Wastewaters 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\* (SM 9221E)  
3 Dilution MTF *E.coli* Test\* (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\*\*

Iron Bacteria (Presence/Absence) (IRB-BART)\*\*\*

Plate Count on Soils and Sludges (SM 9215B) (Std. Meth. 19<sup>th</sup> ed.)

Water Suitability

Inhibitory Residue

\*Must be performed in conjunction with coliform test.  
\*\*Subcontracted. Price is approximate.  
\*\*\*Iron Related Bacteria - Biological Activity Reaction Tests

**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<sub>4</sub>-N)  
    Inorganic (NH<sub>4</sub>+NO<sub>3</sub>+NO<sub>2</sub> 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<sup>6</sup>)  
Specific Gravity  
Sulfate  
Sulfide  
TOC  
TOX  
Turbidity

**Drinking Waters & Wastewaters  
Inorganic Analyses  
Metals**

| <b>Analysis</b>   | <b>EPA Method<br/>(ICP)</b> | <b>EPA Method<br/>(ICP/MS)</b> | <b>Method<br/>(Other)</b> |
|---|-----------------------------|--------------------------------|---------------------------|
| 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 <sup>+6</sup> )                | n/a                         | n/a                            | SM 3500CrD**              |
| Chromium, Hexavalent (Cr <sup>+6</sup> )<br>(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  | 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 507**

Nitrogen & Phosphorus Pesticides  
(California CDPH Regulated Compounds)

**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 2 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)

**Drinking Waters  
California Title 22/SDWA  
Complete Requirements<sup>1</sup>**

**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                          |   |
| 507   | Nitrogen & Phosphorus Pesticides      |   |
| 508   | Chlorinated Pesticides & PCB's as DCP |   |
| 515.3 | Chlorinated Acid Herbicides           |   |
| 525.2 | DEHP, DEHA, Benzo(a)Pyrene            |   |
| 531.1 | Carbamates                            | * |
| 547   | Glyphosate                            | * |
| 548.1 | Endothall                             |   |
| 549.1 | Diquat                                | * |
| 1613  | Dioxin (2,3,7,8 TCDD)                 | * |

<sup>1</sup> Note: Individual requirements vary according to vulnerability.  
\*Subcontracted.

**Drinking Waters  
California Title 21/CDPH Food & Drug Branch  
Complete Requirements<sup>1</sup>**

**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 507   | Nitrogen & Phosphorus Pesticides      |
| EPA 508   | Chlorinated Pesticides & PCB's as DCP |
| EPA 515.3 | Chlorinated Acid Herbicides           |
| EPA 525.2 | DEHP, DEHA, Benzo(a)Pyrene            |
| 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<sup>2</sup>** (Includes: Gross Alpha and Beta particle activity and Radium 228)

**Group VI Bacteriological** (Presence Absence - Coliform)

**Group VII Disinfection Byproducts and Residual Disinfectants<sup>3</sup>**  
(Includes: Bromate, Chlorite, HAAs, Chloramine, Chlorine, Chlorine Dioxide)

<sup>1</sup> Note: Individual requirements vary according to vulnerability (see CDPH website).

<sup>2</sup> 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.

<sup>3</sup> 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**

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

## Drinking Waters

### *Federal Unregulated Contaminant Monitoring Rule (UCMR 2)\**

| <b>Analysis</b>                                      | <b>Method</b> |
|--|---------------|
| <b>List 1: Assessment Monitoring</b>                 |               |
| Dimethoate, Terbufos Sulfone, 5 Brominated compounds | EPA 527       |
| Explosives (3 compounds)                             | EPA 529       |
| <b>List 2: Screening Survey</b>                      |               |
| Nitrosamines (6 compounds)                           | EPA 521       |
| Acetochlor, Alachlor, Metolachlor (parents)          | EPA 525.2     |
| Acetanilide degradates (6 compounds)                 | EPA 535       |

### *California Unregulated Chemicals Requiring Monitoring (CA UCMR)*

|  |             |
|--|-------------|
| Chromium VI  | EPA 218.6   |
| Perchlorate  | EPA 314.0   |
| Vanadium   | EPA 200.8   |
| Boron  | EPA 200.7   |
| Dichlorodifluoromethane (Freon 12)<br>Ethyl tertiary butyl ether (ETBE)<br>Tertiary amyl methyl ether (TAME)<br>Tertiary butyl alcohol (TBA) | EPA 524.2   |
| 1,2,3 - Trichloropropane (1,2,3 - TCP)   | CA DHS SRLB |

\* 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)

**EPA Method 507**

Triazine/Nitrogen Herbicides  
(Includes EPA Method 619, 633, 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 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**

| <b>Analysis</b>   | <b>Method</b>                            |
|---|--|
| <b>Characteristics</b>  |  |
| 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<br>Dichromate Reduction |
| Total Organic Carbon (TOC)                                      | Combustion/IR                            |
| Total Organic Carbon (TOC) – Groundwater                        | EPA 9060/SM 5310B                        |
| Extractable Organic Halides (EOX) – Solids                      | EPA 9023                                 |
| Total Organic Halides (TOX) – Groundwater                       | EPA 9020/SM 5320B                        |
| Water Content (solids)  | Gravimetric                              |
| Soil Corrosion (pH, Redox, Sat. Res., Sulfide)                  |  |
| <b>Sample Preparation (Extracts, Digestions &amp; Clean Up)</b> |  |
| 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 <sup>+6</sup> )                            | 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                               |
| <b>Inorganic Non-Metals &amp; Bacteriology</b>                  |  |
| Anions (Cl, NO <sub>3</sub> , SO <sub>4</sub> )                 | 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 9212                                 |
| Cyanide, Amenable to chlorination                               | EPA 9212                                 |
| 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**

| <b>Analysis</b>                          | <b>EPA Method<br/>(ICP)</b> | <b>EPA Method<br/>(ICPMS)</b> | <b>EPA Method<br/>(Other)</b> |
|--|-----------------------------|-------------------------------|-------------------------------|
| <b>Metals</b>                            |                             |                               |                               |
| 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 <sup>+6</sup> ) | n/a                         | n/a                           | 7199                          |
| Chromium, hexavalent (Cr <sup>+6</sup> ) | 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**

| <b>Analysis</b>  | <b>Method</b>   |                |
|--|-----------------|----------------|
| <b>General Organics</b>  |                 |                |
| Oil & Grease, Total Recoverable  | EPA 9070/9071   |                |
| Phenolics, total   | EPA 9066        |                |
| TOC, TOX   | (See Page 11)   |                |
| <b>Chromatographic Organics</b>  |                 |                |
| EDB and DBCP   | EPA 8011        |                |
| Volatile Organics (GC/MS)  | EPA 8260        |                |
| Volatile Organics <i>listed in</i><br>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 <i>listed in</i><br>EPA 8000 series methods     | EPA 8270        | See Appendix B |
| <b>Pesticides &amp; Arochlors</b>                                      |                 |                |
| Organochlorine (PCB's <i>not</i> 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.

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

**Analysis**

**Non-Volatiles Extraction (Water)**

Hexavalent Chromium (Cr<sup>+6</sup>)

**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                   |                |

**TOTAL T.C.L.P. Analysis**

**Soils  
Fuel Tank Removal  
Miscellaneous & EPA Methods**

| <b>Analysis</b>  | <b>Method</b>      |
|--|--------------------|
| <b>Total Petroleum Hydrocarbons (TPH)</b><br>Total Recoverable Petroleum Hydrocarbons          | Spectrophotometric |
| <b>Total Volatile Hydrocarbons (EPA 8015 or 8260)</b><br>Gasoline Range Organics (GRO) only    | GC/FID or GC/MS    |
| <b>Total Semi-Volatile Hydrocarbons (EPA 8015 or 8270)</b><br>Diesel Range Organics (DRO) only | GC/FID or GC/MS    |
| <b>EPA Method 8260</b><br>Benzene, Toluene, Xylenes & Ethylbenzene<br>(B-T-X-E and MTBE)       | GC/MS              |
| <b>Total Lead (Pb)</b>   | Acid Digest/ICP-MS |
| <b>Extractable Lead (Pb)/22 CCR §66261 (Appendix II)</b>                                       | 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.

| <b>Analytes of Concern</b>                                   | <b>Analytical Methods required found in:</b>                             | <b>Analyte as found on page(s)</b> |
|--|--|------------------------------------|
| 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                           |
| TOX  | SM 5320B   | 2 and 11                           |
| 1,4 Dioxane  | 8270M  |                                    |
| NDMA   | 8270M or 521   |                                    |

**Appendix B  
Methods for Organic Determinations  
Numerical Listings**

| <b>Method</b> | <b>Analyte</b>                  | <b>ESB Certified Method Used<br/>as Approved Alternative</b> | <b>Cross-Ref.<br/>Page(s)</b> |
|---------------|---------------------------------|--|-------------------------------|
| 314.0         | Perchlorate                     |  | 2, 8                          |
| 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, 13                         |
| 420.1         | Phenolics                       |  | 2                             |
| 420.2         | Phenolics (low level)           |  | 2                             |
| 425.1         | MBAS                            | SM 5540C   | 2                             |
| 450.1         | TOX                             | SM 5320B   | 2                             |
| 501.3         | Total THM's                     | 524.2  | 4                             |
| 502.2         | Volatiles by GC                 | 524.2  | 4, 5                          |
| 504.1         | EDB, DBCP                       |  | 4, 5                          |
| 505           | Chlorinated Pesticides & PCB's  | 508  | 4                             |
| 506           | Phthalates & Adipates           | 525.2  | 4                             |
| 507           | N-P Pesticides                  |  | 4, 5, 6, 7                    |
| 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, 7                    |
| 515.2         | Chlorinated Herbicides          | 515.3  | 4, 5, 6, 7                    |
| 515.3         | Chlorinated Herbicides          | 515.3  | 4, 5, 6, 7                    |
| 515.4         | Chlorinated Herbicides          | 513.3  | 4, 5, 6, 7                    |
| 521           | Nitrosamines                    |  | 8                             |
| 524.2         | Volatiles by GC/MS              |  | 4, 5, 6                       |
| 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, 6                        |
| 550/550.1     | PAH's                           | 525.2  | 4                             |
| 551.1         | Chlorinated DBP's               |  | Upon Request                  |
| 552.1         | Haloacetic DBP's                | SM 6251B   | 4, 8                          |
| 555           | Chlorinated Herbicides          | 515.3  | 4, 5, 6                       |
| 601           | Chlorinated Volatiles           | 624  | 8                             |
| 602           | Aromatic Volatiles              | 624  | 8                             |

\*Subcontracted.

Effective January 1, 2009

E.S. Babcock & Sons, Inc.

951-653-3351

**Appendix B  
Methods for Organic Determinations  
Numerical Listings**

| <b>Method</b> | <b>Analytes</b>                      | <b>ESB Certified Method Used<br/>as Approved Alternative</b> | <b>Cross-Ref.<br/>Page(s)</b> |
|---------------|--------------------------------------|--|-------------------------------|
| 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                 | 507  | 9                             |
| 615           | Chlorinated Herbicides               | 515.3  | 9                             |
| 617           | Misc. Chlorinated Pesticides         | 608  | 9                             |
| 619           | Triazine Pesticides                  | 507  | 9                             |
| 622           | Misc. O-P Pesticides                 | 507  | 9                             |
| 624           | Volatiles by GC/MS                   |  | 9                             |
| 625           | Semivolatiles by GC/MS               |  | 9                             |
| 630/630.1     | Dithiocarbamates                     |  | --                            |
| 632/632.1     | Carbamate Pesticides by HPLC         |  | --                            |
| 633/633.1     | Organonitrogen Pesticides            | 507  | --                            |
| 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  | --                            |
| 1656          | Organochlorine Pesticides<br>& PCB's | 508 (plus 507)   | 9                             |
| 1657          | O-P Pesticides                       | 507 (plus 508)   | 9                             |
| 1658          | Chlorophenoxy Herbicides             | 515.3  | 9                             |
| 1660          | Pyrethins, Fenvalerate               |  | --                            |
| 1664          | TPH/Oil & Grease                     |  | 2, 13                         |
| 3510          | Sep. Funnel Extraction               |  | 11                            |
| 3520          | Cont. Liq./Liq. Extraction           |  | 11                            |
| 3540          | Soxhlet Extraction                   |  | 11                            |
| 3541          | Automated Soxhlet                    | 3540   | 11                            |
| 3545          | Accelerated Extraction               | 3540   | 11                            |

\*Subcontracted.

\*\*Included with determinative method

Effective January 1, 2009

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**Appendix B  
Methods for Organic Determinations  
Numerical Listings**

| <b>Method</b>     | <b>Analytes</b>                     | <b>ESB Certified Method Used<br/>as Approved Alternative</b> | <b>Cross-Ref.<br/>Page(s)</b> |
|-------------------|-------------------------------------|--|-------------------------------|
| 3550              | Ultrasonic Extraction               |  | ** 11                         |
| 3580              | Waste Dilution                      |  | ** 11                         |
| 3610/3611         | Alumina Clean-up                    |  | ** 11                         |
| 3620              | Florisil Clean-up                   |  | ** 11                         |
| 3630              | Silica Gel Clean-up                 |  | ** 11                         |
| 3650              | Acid-Base Clean-up                  |  | ** 11                         |
| 3660              | Sulfur Clean-up                     |  | ** 11                         |
| 3665              | Sulfuric Acid/Permanganate Clean-up |  | ** 11                         |
| 3810              | Headspace                           |  | --                            |
| 3820              | Hexadecane Extraction               |  | --                            |
| 5030/5035         | Purge & Trap                        |  | --                            |
| 5040/5041         | Sorbant Cartridges                  |  | --                            |
| 5050              | Bomb Preparation                    |  | 11                            |
| 5310B (std.meth.) | TOC                                 |  | 7                             |
| 5320B (std.meth.) | TOX                                 |  | 7                             |
| 5910 (std.meth.)  | UV 254 Absorbance                   |  | 7                             |
| 6251B (std.meth.) | Haloacetic DBP's                    |  | 4, 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  | 16                            |
| 8020              | Aromatic Volatiles                  | 8260   | 13, 16                        |
| 8021              | Volatiles by GC                     |  | 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

Effective January 1, 2009

E.S. Babcock & Sons, Inc.

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**Appendix B  
Methods for Organic Determinations  
Numerical Listings**

| <b>Method</b> | <b>Analytes</b>          | <b>ESB Certified Method Used<br/>as Approved Alternative</b> | <b>Cross-Ref.<br/>Page(s)</b> |
|---------------|--------------------------|--|-------------------------------|
| 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         |  | 14                            |
| 8290          | Dioxins & Furans         |  | --                            |
| 8310          | PAH's                    | 8270   | 13                            |
| 8315          | Formaldehyde (Aldehydes) |  | --                            |
| 8318          | Carbamates               |  | 13                            |
| 9020          | TOX                      | SM 5320B   | 11                            |
| 9021          | POX                      |  | *                             |
| 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) E.S. Babcock and Sons, 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 21<sup>st</sup> 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**

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

**Inorganic and Wet Chemistry Analyses**

| <u>Determination</u>     | <u>Method</u>            | <u>Container/<br/>Min. Volume (mL)</u> | <u>Preservative</u>                       | <u>Holding<br/>Time<sup>1</sup></u> |
|--------------------------|--------------------------|--|---|-------------------------------------|
| Alkalinity*              | SM2320B                  | P,G/500                                | ≤6°C                                      | 14 days                             |
| Ammonia                  | SM4500NH3H               | P,G/100                                | ≤6°C,H <sub>2</sub> S0 <sub>4</sub>       | 28 days                             |
| Asbestos                 | 100.2                    | P/1000                                 | ≤6°C                                      | 48 hours <sup>13</sup>              |
| BOD*                     | SM5210B                  | P,G/1000                               | ≤6°C                                      | 48 hours                            |
| Boron                    | 200.7                    | P/500                                  | HNO <sub>3</sub> <sup>8</sup>             | 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                                | HNO <sub>3</sub> <sup>8</sup>             | 6 months                            |
| COD                      | SM5220D                  | P,G/100                                | ≤6°C,H <sub>2</sub> S0 <sub>4</sub>       | 28 days                             |
| Chloride*                | 300.0                    | P,G/100                                | None                                      | 28 days                             |
| Chlorine demand          | SM2350B                  | P,G/1000                               | None                                      | 15 minutes                          |
| Chlorine dioxide*        | SM4500ClO <sub>2</sub> D | P,G/100                                | None                                      | 15 minutes                          |
| Chlorine, residual*      | SM4500ClG                | P,G/100                                | None                                      | 15 minutes                          |
| Chlorate                 | 300.1,300.0              | P,G/100                                | ≤6°C,EDA                                  | 28 days                             |
| Chlorite                 | 300.1,300.0              | P,G/100                                | ≤6°C,EDA                                  | 14 days                             |
| Chromium-Hexavalent      | SM3500CrD                | P,G/100                                | ≤6°C,NH <sub>4</sub> Buffer <sup>15</sup> | 28 days                             |
| Chromium-Hex.(low level) | 218.6                    | P,G/500                                | ≤6°C,NH <sub>4</sub> Buffer <sup>15</sup> | 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 <sup>6</sup> ,NaOH <sup>14</sup>     | 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                                | HNO <sub>3</sub> <sup>8</sup>             | 6 months                            |
| Metals (incl. Cations)   | 6000,200,7000            | P,G/500                                | HNO <sub>3</sub> <sup>8</sup>             | 6 months                            |
| Metals                   | 200.8,6020               | P,G/500                                | HNO <sub>3</sub> <sup>8</sup>             | 6 months                            |
| Mercury                  | 7470,7471,200.8          | P,G/500                                | HNO <sub>3</sub> <sup>8</sup>             | 28 days                             |
|                          | SM3112B                  | P,G/500                                | HNO <sub>3</sub> <sup>8</sup>             | 28 days                             |
| Nitrate*                 | 300.0                    | P,G/100                                | ≤6°C                                      | 48 hours                            |
| Nitrite*                 | SM4500NO <sub>2</sub> B  | P,G/100                                | ≤6°C                                      | 48 hours                            |
| Nitrate-Nitrite          | 300.0                    | P,G/100                                | ≤6°C,H <sub>2</sub> S0 <sub>4</sub>       | 28 days                             |
| Nitrogen–Total Kjeldahl  | 351.2                    | P,G/500                                | ≤6°C,H <sub>2</sub> S0 <sub>4</sub>       | 28 days                             |
| Odor                     | SM2150B                  | P,G/100                                | ≤6°C                                      | 48 hours                            |
| Oil & Grease             | 1664                     | G-A/500 <sup>10</sup>                  | ≤6°C,H <sub>2</sub> S0 <sub>4</sub>       | 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**

| <b><u>Determination</u></b> | <b><u>Method</u></b>      | <b><u>Container/<br/>Min. Volume (mL)</u></b> | <b><u>Preservative</u></b>                        | <b><u>Holding<br/>Time<sup>1</sup></u></b> |
|-----------------------------|---------------------------|---|---|--|
| 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 <sup>6</sup> ,H <sub>2</sub> SO <sub>4</sub> | 28 days                                    |
| Phenols (low level)         | SM5530C                   | G-A/1000                                      | ≤6°C,H <sub>2</sub> SO <sub>4</sub>               | 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 <sub>2</sub> SO <sub>4</sub>               | 28 days                                    |
| Silica, Reactive*           | SM4500 SiO <sub>2</sub> C | P/500   | ≤6°C  | 28 days                                    |
| Silica, Total               | 200.7                     | P/500   | HNO <sub>3</sub> <sup>8</sup>                     | 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 <sup>9</sup>                          | ≤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                                       | HNO <sub>3</sub> <sup>8</sup>                     | 6 months                                   |
| UV-254                      | SM <sup>20th</sup> 5910B  | G-TLC-A/250                                   | ≤6°C  | 48 hours                                   |
| Volatile Acids              | SM5560C                   | P,G/500                                       | ≤6°C  | 7 days                                     |

**Organic Analyses**

| <b><u>Determination</u></b> | <b><u>Method</u></b>     | <b><u>Container/<br/>Min. Volume (mL)</u></b> | <b><u>Preservative</u></b>  | <b><u>Holding Time<sup>1</sup><br/>Extraction/Analysis</u></b> |
|-----------------------------|--------------------------|---|---|--|
| Semivolatiles               | 525                      | G-TLC-A/1000                                  | ≤6°C <sup>3</sup> ,HCl  | 14/30 days   |
| Base/Neutrals/Acid          | 625                      | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 7/40 days  |
|                             | 8270                     | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 7/40 days  |
| Carbamates                  | 531.1                    | VOA-G-A/3 x 40 vials                          | ≤6°C,Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ,MCAA <sup>4</sup> | 28 days  |
| Chlorinated pests/PCBs      | 508                      | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 7/14 days <sup>7</sup>   |
| Chlorinated pests           | 608,8081                 | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 7/40 days <sup>7</sup>   |
| PCBs                        | 608                      | G-TLC-A/1000                                  | ≤6°C  | 1year/1year  |
|                             | 8082                     | G-TLC-A/1000                                  | ≤6°C  | 7/40 days <sup>7</sup>   |
| Chloral Hydrate             | 551.1                    | VOA-G-A/4 x 40 vials                          | ≤6°C,Na <sub>2</sub> SO <sub>3</sub> , P buffer                       | 14/14 days   |
| Chlorinated Herbicides      | 515.3                    | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 14/14 days   |
|                             | 8151                     | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 7/40 days  |
| Diesel Range Organics       | 8015                     | VOA-G/4 x 40 vials, TB <sup>2</sup>           | ≤6°C,HCl or H <sub>2</sub> SO <sub>4</sub>                            | 14 days recom.   |
| Dioxins                     | 1613B                    | G-A/1000                                      | ≤6°C <sup>3</sup>   | 30 days  |
| Diquat                      | 549.1                    | P/1000  | ≤6°C <sup>3</sup>   | 7 days for ext <sup>13</sup>                                   |
| EDB and DBCP                | 504,8011                 | VOA-G-A/3 x 40 vials                          | ≤6°C <sup>3</sup>   | 14 days  |
| Endothall                   | 548.1                    | G-A/500                                       | ≤6°C <sup>3</sup>   | 7/14 days  |
| Ethylene Glycol             | GCFID                    | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 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 <sup>3</sup>   | 14 days <sup>7</sup>   |
| Haloacetic Acids            | SM <sup>19th</sup> 6251B | VOA-G/4 x 40 vials                            | ≤6°C,NH <sub>4</sub> Cl   | 9/21 days  |
| Organophos. Pests.          | 507                      | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 14/28days <sup>7</sup>   |
|                             | 8141                     | G-TLC-A/1000                                  | ≤6°C <sup>3</sup>   | 7/40 days <sup>7</sup>   |

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

**Organic Analyses**

| <b><u>Determination</u></b> | <b><u>Method</u></b> | <b><u>Container/<br/>Min. Volume (mL)</u></b> | <b><u>Preservative</u></b>                         | <b><u>Holding Time<sup>1</sup><br/>Extraction/Analysis</u></b> |
|-----------------------------|----------------------|---|--|--|
| Total Organic Carbon        | SM5310B              | P,G/4 x 40 vials                              | ≤6°C, H <sub>2</sub> SO <sub>4</sub>               | 28 days  |
| Total Organic Halogen       | SM5320B              | G-TLC-A/250                                   | ≤6°C <sup>3</sup> , H <sub>2</sub> SO <sub>4</sub> | 28 days  |
| TPH                         | 418.1                | G-TLC-A/1000                                  | ≤6°C, H <sub>2</sub> SO <sub>4</sub>               | 28 days  |
| Trihalomethanes             | 524.2                | VOA-G-A/4 x 40 vials                          | ≤6°C, NH <sub>4</sub> Cl, P buffer                 | 14 days  |
| Volatile Organics           | 524.2, 624, 8260     | VOA-G/4 x 40 vials, TB <sup>2</sup>           | ≤6°C, HCl <sup>3</sup>                             | 14 days  |

**Radiochemistry Analyses**

| <b><u>Determination</u></b> | <b><u>Method</u></b> | <b><u>Container/<br/>Min. Volume (mL)</u></b> | <b><u>Preservative</u></b>    | <b><u>Holding Time<sup>1</sup><br/>Extraction/Analysis</u></b> |
|-----------------------------|----------------------|---|-------------------------------|--|
| Gross Alpha                 | 900.0, 9310          | P,G/1000                                      | HNO <sub>3</sub> <sup>5</sup> | 6 months   |
| Gross Beta                  | 900.0, 9310          | P,G/1000                                      | HNO <sub>3</sub> <sup>5</sup> | 6 months   |
| Uranium                     | 908.0                | P,G/1000                                      | HNO <sub>3</sub> <sup>5</sup> | 6 months   |
| Radium 226                  | 903.1                | P,G/1000                                      | HNO <sub>3</sub> <sup>5</sup> | 6 months   |
| Radium 228                  | 904.0, 9320          | P,G/2000                                      | HNO <sub>3</sub> <sup>5</sup> | 6 months   |
| Radon                       | 913                  | G-TLC-A /2 x 250 <sup>11</sup>                | ≤6°C                          | 4 days   |
| Strontium 90                | 905.0                | P,G/1000                                      | HNO <sub>3</sub> <sup>5</sup> | 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, 18<sup>th</sup> 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. Monochloroacetic 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 ≥ 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<sub>4</sub> 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  $\leq 6^{\circ}\text{C}$**
- 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.