

**Laboratory Services**

**Price List**



**Sheppard T. Powell**  
**Associates, LLC**

1915 Aliceanna Street - Baltimore, MD 21231  
voice: 410.327.3500 fax: 410.327.7506

**[www.stpa.com](http://www.stpa.com)**

January 2013

# TERMS AND CONDITIONS



## SAMPLE SUBMITTAL

Submit samples with the following.

- Contact information, sample description and level of required service (normal, priority, superpriority). Please indicate desired analyses and any billing instructions.
- Individual sample identification marks, corresponding to accompanying paperwork.

## SAMPLING

The quality of the results depends on the quality of the sampling. The STPA technical staff is available to answer any questions regarding sampling procedures.

## PRIORITY SAMPLES

Priority/Superpriority analyses are available and must be approved and scheduled by the laboratory. For metallurgical and deposit analyses Priority Service (10 business days from sample receipt) is 50% over base price. Superpriority Service (5 business days from sample receipt) is twice the base price. For water analyses, call for pricing.

## QUOTATIONS

Quotations for laboratory services will be provided upon request. Fee discounts may be available for groups of samples submitted for the same analysis.

## CONFIDENTIALITY OF RESULTS

All testing is done in the strictest confidence. Results will be given only to the client. Identified results will be released to other parties only with the written consent of the client.



# METALLURGICAL EXAMINATIONS



**Sheppard T. Powell  
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Baltimore Maryland [www.stpa.com](http://www.stpa.com)

|  |   |
|--|---|
| <b>Boiler/HRSG Tube Deposit Weight Analyses, Mechanical Method Plus Dimensional Assessment</b> - Section Sample, Remove Deposits And Report Grams Per Square Foot Of Area, ASTM D3483-83 Method A, As Received Photos And Visual Examination | \$260 per Specimen  |
| <b>Dimensional/Visual Pipe Assessment</b> - Section Sample, Measure Pipe Inner Diameter, Wall Thicknesses And Pit Depths, As Received Photos, And Document Visual Condition  | \$260 per Specimen<br>(Assumes a 3" or less diameter pipe. Call for larger samples) |
| <b>Condenser Tube Dimensional Survey</b>   | Call for Quotation  |
| <b>Boiler/HRSG Tube Failure Analysis</b> - Mounting And Polishing Of Specimen To Show Nature And Cause Of Damage, Preparing Macrographs, Photomicrographs And Memorandum   | \$1650 per Specimen   |
| <b>Boiler/HRSG Tube Failure Analysis With In Situ SEM</b> - Includes Failure Analysis Plus in situ SEM/EDXS Assessment Plus Metallurgical Report   | \$1950 per Specimen   |
| <b>Boiler/HRSG Tube Microstructure Evaluation</b> - Checks Microstructure On Hot And Cold Side Plus a brief Metallurgical Memorandum   | \$900 per Specimen  |
| <b>Other Failure Analyses (With SEM/EDXS)</b>  | Call for Quotation  |
| Scanning Electron Microscopy (SEM) and/or Energy Dispersive X-Ray Spectroscopy (EDXS) Analysis (Qualitative And Semiquantitative)  | \$225 per Sample* or<br>\$200 per Hour  |
| Preparation Of Mount With Polishing (Not Associated With Failure Analyses)   | \$180 per Mount   |
| Deposit Sample Preparation For SEM/EDXS Analysis (May Be Applicable To Unusual Sample Types)   | \$60 per Specimen   |
| Loss on Ignition Of Deposit  | \$60 per Sample   |
| Technical Consultation, Research And Report Preparation  | \$180 per Hour  |
| Rockwell Hardness Test   | \$40 per Specimen   |
| Surface Examinations (Visual, Microscopic, Metallographic And SEM/EDXS As Required)  | Call for Quotation  |
| Corrosion Or Remaining Life Assessments (Involving Metallurgical Laboratory Consulting And Testing Services)   | Call for Quotation  |
| Metallographic Deposit Thickness Measurement In Boiler/HRSG Tubes (Does Not Include The Cost Of The Mount)   | \$350 per Mount   |

NOTE: Rates do not include engineering fees for interpretation of results.

\* Minimum charge includes grinding and sieving of most deposit samples.

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# DEPOSIT ANALYSES



**Sheppard T. Powell  
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Baltimore Maryland [www.stpa.com](http://www.stpa.com)

| Constituent  | Price |
|--|-------|
| Loss On Ignition (LOI)***                                | \$60  |
| Sample Preparation (For Unusual Samples)                 | \$60  |
| Quantitative Analysis*                                   | \$350 |
| Elemental Analysis (by SEM/EDXS)**                       | \$230 |
| Single SEM/EDXS With LOI**                               | \$290 |
| SEM/EDXS Before And After LOI Test**                     | \$350 |
| IC Scan Of Water Soluble Anions (See Ion Chromatography) | \$160 |
| pH Of 0.1 - 1.0% Suspension                              | \$90  |

Note: Additional Metal Analyses Available Upon Request

\* Quantitative analysis includes quantitative elemental analysis of iron, copper, nickel, zinc, chromium, aluminum, manganese, sodium, calcium, magnesium, molybdenum, phosphate, silica, lead (only reported if found). Barium, water-soluble chloride, and water-soluble sulfate are evaluated qualitatively and quantified if detected by the qualitative test.

\*\* SEM/EDXS is a semiquantitative elemental analysis method.

\*\*\* Please notify the laboratory if vanadium is expected to be present in the sample.

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# WATER ANALYSES



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| Analysis                  | Method      | Detection Limit (mg/L) as                  | Price |
|---------------------------|-------------|--|-------|
| Acetate                   | IC          | 0.005 CH <sub>3</sub> CO <sub>2</sub>      | \$31  |
| Acidity                   | SM 2310     | 5 CaCO <sub>3</sub>                        | \$26  |
| Alkalinity                | SM 2320     | 5 CaCO <sub>3</sub>                        | \$26  |
| Aluminum                  | SM 3111D    | 0.5 Al                                     | \$16  |
|                           | GFAA        | 0.005 Al                                   | \$26  |
| Ammonia                   | Hach 8038   | 0.10 N                                     | \$26  |
| Arsenic                   | GFAA        | N.D.                                       | \$26  |
| Barium                    | SM 3111D    | 0.1 Ba                                     | \$16  |
|                           | GFAA        | 0.050 Ba                                   | \$26  |
| Bromate                   | IC          | 0.3 BrO <sub>3</sub>                       | \$31  |
| Bromide                   | EPA 300.1   | 0.1 Br                                     | \$31  |
| Cadmium                   | SM 3111B    | 0.01 Cd                                    | \$16  |
|                           | GFAA        | 0.005 Cd                                   | \$26  |
| Calcium                   | SM 3111B,D  | 0.2 Ca                                     | \$16  |
|                           | GFAA        | 0.002 Ca                                   | \$26  |
| Chlorate                  | EPA 300.1 B | 0.10 ClO <sub>3</sub>                      | \$37  |
| Chloride                  | EPA 300.1   | 0.1 Cl                                     | \$31  |
|                           | IC          | 0.001 Cl                                   | \$31  |
| Chlorite                  | EPA 300.1 B | 0.10 ClO <sub>2</sub>                      | \$37  |
| Chromium                  | SM 3111B    | 0.2 Cr                                     | \$16  |
|                           | GFAA        | 0.005 Cr                                   | \$26  |
| Color, True And Apparent  | Hach 8025   | Pt Co                                      | \$16  |
| Conductivity              | SM 2510     | 0.1 µS/cm                                  | \$11  |
| Copper                    | SM 3111B    | 0.05 Cu                                    | \$16  |
|                           | GFAA        | 0.001 Cu                                   | \$26  |
| Fluoride                  | EPA 300.1   | 0.25 F                                     | \$31  |
|                           | IC          | 0.005 F                                    | \$31  |
| Formate                   | IC          | 0.005 HCO <sub>2</sub>                     | \$31  |
| Glycol, Ethylene          | Colormetric | 1 ppm HOCH <sub>2</sub> CH <sub>2</sub> OH | \$31  |
| Hardness, Total (Ca + Mg) | FAA         | 0.2 CaCO <sub>3</sub>                      | \$32  |
|                           | GFAA        | 0.010 CaCO <sub>3</sub>                    | \$52  |

**SM** - Standard Methods For Examination Of Water And Wastewater. 21st Edition, 2005

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**EPA** - Methods For Chemical Analysis Of Water And Wastes, EPA-600/4-79-020, March 1983

**Hach** - Hach Company Water Analysis Method

**IC** - Ion Chromatography

**FAA** - Flame Atomic Adsorption Spectroscopy

**GFAA** - Graphite Furnace Atomic Absorption Spectroscopy

**NPOC** - Nonpurgable Organic Carbon

**N.D.** - Not Determined

**Note** - \$15.00 Sample Preparation Charge May Apply For Samples Requiring Digestion, Filtration Or Dilution

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| Analysis           | Method     | Detection Limit (mg/L) as                           | Price |
|--------------------|------------|---|-------|
| Iron               | SM 3111B   | 0.05 Fe   | \$16  |
|                    | GFAA       | 0.002 Fe  | \$26  |
| Lead               | SM 3111B   | 0.5 Pb  | \$16  |
|                    | GFAA       | 0.005 Pb  | \$26  |
| Magnesium          | SM 3111B   | 0.05 Mg   | \$16  |
|                    | GFAA       | 0.001 Mg  | \$26  |
| Manganese          | SM 3111B   | 0.5 Mn  | \$16  |
|                    | GFAA       | 0.010 Mn  | \$26  |
| Molybdenum         | SM 3111D   | 0.5 Mo  | \$16  |
| Molybdate          | Hach 8036  | 0.5 Mo <sup>+6</sup>                                | \$21  |
| Nickel             | SM 3111B   | 0.5 Ni  | \$16  |
|                    | GFAA       | 0.005 Ni  | \$26  |
| Nitrate            | EPA 300.1  | 0.07 N  | \$31  |
|                    | IC         | 0.003 NO <sub>3</sub>                               | \$31  |
| Nitrite            | EPA 300.1  | 0.03 N  | \$31  |
|                    | IC         | 0.002 NO <sub>2</sub>                               | \$31  |
| pH                 | SM 4500 H+ | N/A   | \$10  |
| Phosphonate        | Hach       | 1.0   | \$26  |
| Phosphorous, Total | Hach 8190  | 0.10 P  | \$26  |
|                    | Hach 8048  | 0.10 P  | \$26  |
| Phosphate, Ortho   | EPA 300.1  | 0.3 PO <sub>4</sub>                                 | \$31  |
|                    | IC Hach    | 0.010 PO <sub>4</sub>                               | \$31  |
|                    |            | 0.10 PO <sub>4</sub>                                | \$26  |
| Potassium          | SM 3111B   | 0.05 K  | \$16  |
|                    | GFAA       | 0.001 K   | \$26  |
| Propionate         | IC         | 0.2 CH <sub>3</sub> CH <sub>2</sub> CO <sub>2</sub> | \$31  |
| Selenium           | GFAA       | N.D.  | \$26  |

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**NPOC** - Nonpurgable Organic Carbon

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# WATER ANALYSES



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| Analysis                  | Method                     | Detection Limit (mg/L) as | Price    |
|---------------------------|----------------------------|---------------------------|----------|
| Silica, Soluble           | SM 4500-SiO <sub>2</sub> D | 0.005 SiO <sub>2</sub>    | \$40     |
|                           | Hach 8185                  | 1 SiO <sub>2</sub>        | \$26     |
|                           | Hach 8186                  | 0.010 SiO <sub>2</sub>    | \$26     |
| Silver                    | SM 3111B                   | 1 Ag                      | \$16     |
|                           | GFAA                       | 0.005 Ag                  | \$26     |
| Sodium                    | SM 3111B                   | 0.5 Na                    | \$16     |
|                           | GFAA                       | 0.001 Na                  | \$26     |
| Solids, Total             | --                         | --                        | \$50     |
| Total Dissolved (TDS) And | SM 2540 C                  | 10                        | Included |
| Total Suspended (TSS)     | SM 2540 D                  | 4                         | Included |
| Sulfate                   | EPA 300.1                  | 0.3 SO <sub>4</sub>       | \$31     |
|                           | IC                         | 0.002 SO <sub>4</sub>     | \$31     |
| Titanium                  | SM 3111D                   | 1 Ti                      | \$16     |
| TOC (NPOC)                | SM 5310 C                  | 0.010                     | \$42     |
|                           | ASTM D 4779                |                           |          |
|                           | EPA 415.2                  |                           |          |
| TOC + TIC                 | SM 5310 C                  | 0.010                     | \$62     |
|                           | ASTM D 4779                |                           |          |
|                           | EPA 415.2                  |                           |          |
| Tolyltriazole             | Hach                       | 1                         | \$26     |
| Turbidity                 | EPA 180.1                  | 1 NTU                     | \$26     |
| Vanadium                  | SM 3111D                   | 1 V                       | \$16     |
|                           | GFAA                       | 0.05 V                    | \$26     |
| Zinc                      | SM 3111B                   | 0.05 Zn                   | \$16     |
|                           | GFAA                       | 0.005 Zn                  | \$26     |

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# WATER ANALYSES



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## SAMPLE BOTTLES

Provision Of Pretreated Bottles For High Purity Water Samples Is Available At The Following Rates. These Prices Do Not Include Shipping Charges, Which Are Billed At Cost. Shipping Is Provided Via UPS.

| Qty | Description              | Volume | Price   |
|-----|--------------------------|--------|---------|
| 1   | Pretreated Sample Bottle | 125 mL | \$5.00  |
| 1   | Pretreated Sample Bottle | 250 mL | \$7.50  |
| 1   | Pretreated Sample Bottle | 500 mL | \$10.00 |

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# ION CHROMATOGRAPHY



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| Constituent And Analysis | Method      | Detection Limit (mg/L) As                           | Price |
|--------------------------|-------------|---|-------|
| Acetate                  | IC          | 0.005 CH <sub>3</sub> CO <sub>2</sub>               | \$31  |
| Bromate                  | IC          | 0.3 BrO <sub>3</sub>                                | \$31  |
| Bromide                  | EPA 300.1   | 0.2 Br  | \$31  |
|                          | IC          | 0.003 Br  | \$31  |
| Chlorate                 | EPA 300.1 B | 0.10 ClO <sub>3</sub>                               | \$37  |
| Chloride                 | EPA 300.1   | 0.1 Cl  | \$31  |
|                          | IC          | 0.002 Cl  | \$31  |
| Chlorite                 | EPA 300.1 B | 0.10 ClO <sub>2</sub>                               | \$37  |
| Fluoride                 | EPA 300.1   | 0.25 F  | \$31  |
|                          | IC          | 0.005 F   | \$31  |
| Formate                  | IC          | 0.005 HCO <sub>2</sub>                              | \$31  |
| Nitrate                  | EPA 300.1   | 0.3 N   | \$31  |
|                          | IC          | 0.003 NO <sub>3</sub>                               | \$31  |
| Nitrite                  | EPA 300.1   | 0.2 N   | \$31  |
|                          | IC          | 0.003 NO <sub>2</sub>                               | \$31  |
| Perchlorate              | IC          | 0.010 ClO <sub>4</sub>                              | \$31  |
| Phosphate, Ortho         | EPA 300.1   | 0.3 PO <sub>4</sub>                                 | \$31  |
|                          | IC          | 0.010 PO <sub>4</sub>                               | \$31  |
| Propionate               | IC          | 0.2 CH <sub>3</sub> CH <sub>2</sub> CO <sub>2</sub> | \$31  |
| Sulfate                  | EPA 300.1   | 0.3 SO <sub>4</sub>                                 | \$31  |
|                          | IC          | 0.003 SO <sub>4</sub>                               | \$31  |

**EPA** - Methods For Chemical Analysis Of Water And Wastes,  
EPA-600/4-79-020, March 1983  
**IC** - Ion Chromatography

**Note** - Method Development For Additional Anions Or Unusual Matrices  
Available Upon Request

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# CHEMICAL CLEANING SOLVENT ANALYSES



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| Analysis          | Method      | Price |
|-------------------|-------------|-------|
| Alkalinity        | SM 2320     | \$26  |
| Aluminum          | SM 3111 D   | \$16  |
| Ammonia           | ASTM D2790  | \$26  |
| Bromate           | ASTM D2790  | \$31  |
| Calcium           | SM 3111 D   | \$16  |
| EDTA              | STPA        | \$31  |
| Chromium          | SM 3111 D   | \$16  |
| Conductivity      | SM 2510 B   | \$16  |
| Copper            | SM 3111 B   | \$16  |
| HAF Acid          | ASTM D2790  | \$26  |
| Hydrochloric Acid | ASTM D2790  | \$26  |
| Iron              | SM 3111 B,D | \$16  |
| Lead              | SM 3111 B   | \$16  |
| Magnesium         | SM 3111 B   | \$16  |
| Manganese         | SM 3111 B   | \$16  |
| Nickel            | SM 3111 B   | \$16  |
| Permanganate      | STPA        | \$31  |
| pH                | Electrode   | \$10  |
| Silica            | 3111 D      | \$16  |
| Zinc              | SM 3111 B   | \$16  |

**ASTM** - American Society For Testing And Materials

**STPA** - Sheppard T. Powell Associates, LLC Procedure

**FAA** - Flame Atomic Absorption Spectroscopy

**SM** - Standard Methods For Examination Of Water And Wastewater. 20th Edition, 1998

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# CHEMICAL LAB EVALUATIONS



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Chemical Cleaning Simulation (Laboratory Evaluation of  
Prospective Cleaning Solvents And Process Conditions)

Call For Exact  
Quotation

First Stage/Day

\$400\*

Subsequent Stages/Days

\$300\*

Corrosion Coupons (Preparation, Cleaning And Weighing Of  
Corrosion Coupons And Determination Of Corrosion Rates)

Call For Quotation

Special Chemical Analyses (Following Client Procedures Or  
Procedures Developed By STPA)

Call For Quotation

---

**ASTM** - American Society For Testing And Materials

**STPA** - Sheppard T. Powell Associates, LLC Procedure

**FAA** - Flame Atomic Absorption Spectroscopy

**SM** - Standard Methods For The Examination Of Water And Wastewater

**Note** - Sample Preparation - \$15.00 (May Include Filtration, Dilution  
and/or Digestion)

\* Plus The Cost Of Chemical Cleaning Solvent Analyses

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# RECOMMENDED SAMPLING AND PRESERVATION



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## WATER SAMPLES

| Analysis           | Volume Required (mls) | Preservation                                      | Holding Time        |
|--------------------|-----------------------|---|---------------------|
| Acidity            | 100                   | Cool, 4°C   | 14 Days             |
| Alkalinity         | 100                   | Cool, 4°C   | 14 Days             |
| Ammonia            | 400                   | Cool, 4°C, H <sub>2</sub> SO <sub>4</sub> , pH <2 | 28 Days             |
| BOD                | 1,000                 | Cool, 4°C   | 48 Hours            |
| Bromide            | 100                   | None Required                                     | 28 Days             |
| COD                | 50                    | Cool, 4°C, H <sub>2</sub> SO <sub>4</sub> , pH <2 | 28 Days             |
| Chloride           | 100                   | None Required                                     | 28 Days             |
| Chlorine           | 200                   | None Required                                     | Analyze Immediately |
| Color              | 50                    | Cool, 4°C   | 48 Hours            |
| Conductivity       | 100                   | Cool, 4°C   | 28 Days             |
| Fluoride           | 100                   | None Required                                     | 28 Days             |
| Hardness           | 100                   | HNO <sub>3</sub> , pH <2                          | 6 Months            |
| Hydrazine          | 100                   | None Required                                     | Analyze Immediately |
| Metals             |                       |   |                     |
| Dissolved          | 200                   | Filter On Site, HNO <sub>3</sub> , pH <2          | 6 Months            |
| Suspended          | 200                   | Filter On Site                                    | 6 Months            |
| Total              | 100                   | HNO <sub>3</sub> , pH <2                          | 6 Months            |
| Nitrate            | 100                   | Cool, 4°C   | 48 Hours            |
| Nitrite            | 100                   | Cool, 4°C   | 48 Hours            |
| pH                 | 50                    | None Required                                     | Analyze Immediately |
| Phosphonate        | 100                   | None Required                                     | Analyze Immediately |
| Phosphorous, Total | 200                   | Cool, 4°C, H <sub>2</sub> SO <sub>4</sub> , pH <2 | 28 Days             |
| Phosphate, Ortho   | 100                   | Cool, 4°C   | 48 Hours            |
| Silica, Soluble    | 250                   | Cool, 4°C   | 28 Days             |
| Solids             | 100                   | Cool, 4°C   | 7 Days              |
| Sulfate            | 100                   | Cool, 4°C   | 28 Days             |
| TOC / TIC / NPOC   | 100                   | Cool, 4°C, H <sub>2</sub> SO <sub>4</sub> , pH <2 | 28 Days             |
| Triazole           | 100                   | None Required                                     | Analyze Immediately |
| Turbidity          | 100                   | Cool, 4°C   | 48 Hours            |

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