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Tools of the Trade: Choosing an Analytical Testing Laboratory

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Tools of the Trade: Choosing an Analytical Testing Laboratory

Introduction:

Before you purchase…..

a consumer good,
professional tool, or
service,

…….it helps to identify what you need.

Once you have clearly identified the project , you can compare what different labs offer.

Analytical costs can be significant, but with a little background you can make sure you are getting results that will meet your needs without unnecessary testing, with the quality you deserve, at a reasonable cost.

Tools of the Trade: Choosing an Analytical Testing Laboratory

Cost should not be your only consideration in choosing a laboratory. Certain questions should be asked of the analytical lab to determine if they can produce the services you will need to meet the regulatory requirements.

How much experience does the lab have providing the services required?

What are staff members' training and qualifications?

Can the facility provide a list of customers and customer references?

Is the facility independent, or is it part of a company with other lines of business?

What purpose(s) will the analysis results serve? Is the work necessary for regulatory submission or are the data garnered from primary research?

Does the laboratory perform all of its analyses in-house? If not, does the original laboratory require that all subcontracting labs meet standards that are acceptable to you?

How long will it take to get results?

Does the laboratory identify the methods used in its reports, and are they the methods you require them to use?

Is the facility accredited by appropriate accrediting bodies?

Tools of the Trade: Choosing an Analytical Testing Laboratory

Identifying your needs:

Full Service or Specialty

Organic:
- GCFID, GCECD, GCMS

Trace Metals:
- ICP-AES, ICP-MS
- FAA, HGA, CVAA

Inorganic:
- UV/VIS Spectrophotometers
- IC
- FIA
- Auto Analyzers
- Meters

Microbiological:
- Autoclave
- Incubators
- Ovens

Tools of the Trade: Choosing an Analytical Testing Laboratory

Pre-Project Support

Technical Consultation
Bid Opportunities
Technical Bulletins
Regulatory Resource
QAPP Review
R & D Project Discussions

Pre-Field Services Support

Technical Consultation
Project Cost Evaluations/Options
Free Container Packages (preservative, coolers, ice packs, COC, bottle order sheet)
Container Delivery
Sample Pick-up Options/Schedule
Verify Rush Work
Immediate Communication if question COC
QA/QC Data Deliverable Package Options

Pre-Lab Support

Technical Consultation-Chemists
Auto-Lab Pack*

Field Services

Simco® or GeoProbe® Direct Push
Collect Samples / Install Wells
Equipment Rental

Laboratory Analysis

Technical Consultation-Chemists
Strict Adherence to QA/QC Methodologies
Consistent 2-10 day TAT (5 day goal)
Full Services
Chemist calls - unusual results
Preliminaries Faxed
Final Results-mailed, email, EDD
Invoices included with final report

Post-Lab/Post- Field Services Support

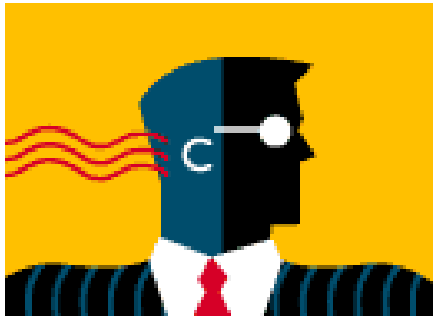
Technical Consultation
Project Review

Choosing an Analytical Laboratory

Identifying your needs:

Alphabet Soup:

- SOW, DQO, QAPP
- SDWA, CWA, CAA, CERCLA, RCRA
- NPDES, IDP, RGP, RCMP, MCP, AGQS



Quality Assurance/Control:

- Summary Table
- Method Batch QC
- Site Specific QC

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Identifying your needs:

- Analytical & Prep Method Requirements
  - Code of Federal Regulations, Title 40
    - Protection of the Environment
  - EPA-600
    - Methods for Chemical Analysis of Water and Wastes
  - Standard Methods
    - Water & Wastewater
  - EPA SW846
    - Test Methods for Evaluating Solid Wastes, Physical/Chemical
  - Other
    - ASTM
    - USGS
    - AOAC

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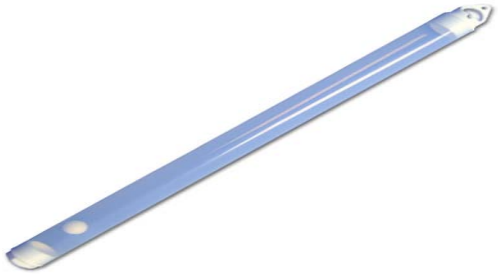
Identifying your needs:

- Accreditation or Certification
  - In house testing and Subcontracted testing

Tools of the Trade: Choosing an Analytical Testing Laboratory

- Sample Collection
- Select appropriate method
  - Standard purge
  - Low flow (micro-purge)
  - No-purge
- Select appropriate equipment
  - Bailer
  - Inertial pump
  - Submersible pump
  - Bladder pump
  - Diffusion bag



Every choice impacts the sample!

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- **Standard Purge**
  - **Calculate water volume**
  - **Evacuate 3-5 well volumes**
  - **Allow recharge**
- Low Flow
  - 100-1000mls/min
  - Monitor indicators until stable

- No-purge
  - Deploy bag
  - Wait 2-4 weeks
  - Retrieve bag

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Sample Collection:

- Sample Types
  - Grab
    - ✓Discrete aliquot
    - ✓Specific location
    - ✓Specific instant in time
    - ✓Snapshot
    - ✓Container, preservation specific
    - ✓Analyte-appropriate collection method
  - Composite
    - ✓Multiple aliquots combined in specific fashion
    - ✓Time, flow, mass, etc.
    - ✓Movie clip
    - ✓Variation due to time, distance, area
    - ✓Maintain proper handling
    - ✓Analyte-appropriate
  - Grab Composite
    - ✓Multiple Discrete aliquots
    - ✓Specific location
    - ✓Representative over time, flow, mass, etc.
    - ✓Container, preservation specific
    - ✓Analyte-appropriate collection / composite method

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Sample Collection:

- Protocols and Techniques
  - Microbiology
  - Sample Container ; Sterile container provided

- Proper Sampling Technique
  - Keep container sterile
  - Beware the single stem!
  - In-stream sample
  - Special considerations for surface waters

- Hold Times

• Wastewater	6 to 8 hours
• Drinking Water	6 to 30 hours
• Groundwater Monitoring	6 to 24 hours
• Surface Water	6 to 8 hours
• Solids/Biosolids	6 to 30 hours

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Sample Collection:

- Protocols and Techniques
  - Metals
  - Dissolved Metals
    - *Dissolved = passed through a 0.45 µMembrane filter*
  - Total Metals
    - *Total = "Complete in extent or degree; Absolute."*
    - Aqueous or Solid
  - TCLP Metals
    - Disposal
    - Solid or Aqueous
  - Method 1669
    - Clean hands / dirty hands
  - Organics
  - VOCs
    - Water
      - HCl, glass, no headspace
    - Sludge – low % solids
      - Unpreserved Glass jar or VOA vial
    - Soil/Solid – high % solids
      - Method 5035; MeOH

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Sample Collection:

- Container Types, Preservation, and Hold Times
  - Aqueous: plastic, glass, amber glass, sterilized
    - Code of Federal Regulations
    - Method Specific
      - Acids pH <2
      - Alkaline pH > 10
      - Thermal
      - Short Time Consideration
  - Soil: plastic, glass, amber glass, sterilized
    - Method Specific
      - VOC collected in Methanol Vials
      - Thermal
      - Short Time Consideration

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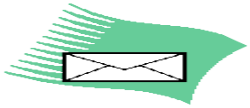
Sample Collection:

- Documentation
  - Field Notes
    - Purpose of sampling
    - Date/Time of collection
    - Field measurements
    - Weather
    - Maps/sketches
    - Sampling procedures
    - Observations
  - Chain of Custody
    - Legally binding documentation
    - Agreement between sample containers and chain of custody
    - Importance of accurate completion

Tools of the Trade: Choosing an Analytical Testing Laboratory

Customer Service Orientation:

- Qualification Package
  - Experience & references
  - Key Technical Personnel



- Final Report Package
  - Hard Copy Report and Invoice
  - 2nd Party Billing, additional reports
  - Electronic Deliverables

- Containers and Carriers
  - Free or Fee for
  - Shipping Costs Free of Fee for
  - Courier Service?

- Costs
  - Unit Cost and Aggregate Cost
  - Competitive Bid
  - Agreed to pricing (Petroleum Funding)