

Petroleum Laboratories, Inc.

Schedule of Services

Prices Upon Request

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WATER & WASTEWATER ANALYSES

➤ Acidity – titration	
➤ Alkalinity – titration	
➤ Amine Residual – existing curve	
➤ Amine Residual – new curve	
➤ Ammonia (see Nitrogen)	
➤ B.O.D. (5 Day) / C.B.O.D.	
➤ Bromide – electrode	
➤ Chloride – titration	
➤ Chlorine – colorimetric	
➤ C.O.D. – dichromate reflux	
➤ Color – platinum-cobalt	
➤ Conductivity – meter	
➤ Cyanide – distillation*	
➤ Fluoride – selective ion electrode	
➤ Hardness – titration	
➤ Inhibitor – colorimetric	
➤ Iodide – colorimetric	
➤ Metals by ICAP	Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Phosphorus, Rubidium, Selenium, Silica, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc
➤ Metals by AA	Aluminum, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Rubidium, Silver, Sodium, Strontium, Thallium, Tin, Vanadium, Zinc
➤ Chromium, Hexavalent*	
➤ Mercury – cold vapor*	
➤ Metals Preparation / Digestion	
➤ Nitrogen	
	Ammonia Nitrogen – distillation
	Ammonia Nitrogen – no distillation
	Kjeldahl Nitrogen – distillation, digestion*
	Nitrate Nitrogen – colorimetric
	Nitrite Nitrogen – colorimetric

*Subcontracted

WATER & WASTEWATER ANALYSES (cont'd.)

➤	Oil and Grease
	Gravimetric (EPA 413.1, SM 5520B)
	Gravimetric / Gravimetric Silica
	Infrared
	Soluble Oil (Infrared w/SGT)
	Soxhlet
	Hexane (EPA Method 1664 HEM)
	(EPA Method 1664 HEM-SGT)
➤	Oxygen – dissolved
➤	pH - meter
➤	Phenol – colorimetric
➤	Phenol – distillation*
➤	Phosphate
➤	Resistivity
➤	Solids
	Dissolved – gravimetric
	Dissolved, volatile – gravimetric
	Settleable – imhoff cone
	Suspended – glass fiber filtration
	Suspended, volatile – glass fiber filtration
	Total – gravimetric
➤	Specific Conductance – meter
➤	Specific Gravity – pycnometer
➤	Sulfate – turbidimetric
➤	Sulfide*
➤	Sulfite – titration
➤	Surfactants (MBAS) – colorimetric
➤	Total Organic Carbon
➤	Turbidity – meter

COMPREHENSIVE WATER ANALYSIS

➤ Oilfield Brine	<p><u>Cations</u> – Sodium (calc), Calcium, Magnesium, Barium, Iron (dissolved and precipitated)</p> <p><u>Anions</u> – Chloride, Sulfate, Carbonate, BiCarbonate</p> <p><u>Other Properties</u> - pH, Specific Gravity, Resistivity, Total Dissolved Solids (calc.), Mineral Analysis Pattern, Stiff & Davis Stability Index (calc.), for scaling or corrosion tendencies, calcium sulfate solubility, barium sulfate solubility, and total equivalent sodium chloride will be calculated upon request</p>
➤ Fresh Water	<p><u>Cations</u> - Silica, Manganese, Iron, Calcium, Magnesium, Sodium</p> <p><u>Anions</u> - Chloride, BiCarbonate, Carbonate, Sulfate, Fluoride, Nitrate</p> <p><u>Other Properties</u> – Total Hardness, “P” Alkalinity, “MO” Alkalinity, pH, Turbidity, Color, Langelier Saturation Index or Ryzner Stability Index</p>

GLYCOL ANALYSES

- Water (Karl Fisher Method)
- Hydrocarbon
- Chloride (also as NaCl)
- Suspended Solids
- pH
- Iron
- TEA Requirements
- Foaming Tendencies
- Reserve Alkalinity

BACTERIOLOGICAL ANALYSES

- Acid Producing Bacteria
 - 1st Dilution
 - Each additional dilution
- Anaerobic Sulfate Reducers
 - 1st Dilution
 - Each additional dilution
- Fecal Coliform – MFP
- Fecal Coliform – MPN
- Total Bacteria – MFP
- Total Coliform – MFP

GAS ANALYSIS

- Gas Analysis thru C⁶⁺
 - Includes – Mol. %, GPM, Specific Gravity, BTU (dry and wet)
 - At pressure base of 15.025. Calculated at other
 - Pressure bases upon request
- Hydrogen Sulfide
- Sulfide Dioxide
- Other Gases by Draeger Tube upon request

HYDROCARBON ANALYSES

- Algae (organic matter)
- API Gravity – ASTM D287
- Ash Content – ASTM D482
- Ash, Sulfated Residue – ASTM D874
- Asphaltenes
- Bottom Sediment & Water – ASTM D96
- Carbon Residue – ASTM D189
- Cetane Index – ASTM D849 (includes Distillation & API Gravity)
- Cloud Point – ASTM D2500
- Color, Saybolt – ASTM D156
- Corexit Dispersibility
- Corrosion, Copper Strip – ASTM D849
- Distillation – ASTM D86
- Fire Point (includes Flash Point) – ASTM D92
- Flash Point:
 - Closed Cup – ASTM D56 (Fisher Tag)
 - Closed Cup – ASTM D93 (Pensky Martin)
 - Open Cup – ASTM D92
- Melting Point
- Metals (see Lube Oil Analysis section)
- Paraffin Content – low temp. extraction
- Pour Point – ASTM D97
- Reid Vapor Pressure
- Salt Content – ASTM D878
- Sulfur – ASTM D4294
- Total Acid Number
- Total Base Number
- Viscosity – ASTM D445
- Wax Deposition Test / Cold Spot (per chamber)

LUBE OIL ANALYSES

- 20 Element Spectrographic Analysis (ICAP)
- Physical Properties Analysis
- Glycol (coolant) Test
- Particle Count Analysis (ISO 11171)
 - (Includes ISO and NAS Cleanliness Codes)
- Volume Price Breakdown (Basic Analysis Only)
 - 1 – 9 Samples Per Month
 - 10 – 39 Samples Per Month
 - 40 – 79 Samples Per Month
 - 80 – 99 Samples Per Month
 - 100 + Samples Per Month

STATEWIDE ORDER 29-B

➤ WATER:

Reserve Pit (pH, TSS, Chloride, COD, Cr, Zn, Oil & Grease)

➤ SOIL:

LA 29-B Full (package)

LA 29-B Salts

LA 29-B Metals

Drying & Grinding

pH

Moisture

Oil and Grease (TPH)

EC

ESP

SAR

CEC

Paste & Extraction

Digestion for Metals

Chloride

(sample preparation charges will be added as necessary)

CORROSION COUPONS

➤ Cleaned, Weighed, MPY Calculated

➤ Mild Steel Rod Type Coupons – up to 3”

➤ Mild Steel Rod Type Coupons – over 3”

➤ Mild Steel Flat Type Coupons – up to 3”

➤ Mild Steel Flat Type Coupons – over 3”

➤ Scale Coupons – Flat Type – most sizes

➤ Scale Coupons – Rod Type – most sizes

➤ Disc Coupons

➤ Coupon Accessories:

½” Coupon holder – rod type

¾” Coupon holder – rod type

¾” Coupon holder – flat type

1” Coupon holder – rod type

1” Coupon holder – flat type

2” Coupon holder – rod type

2” Coupon holder – flat type

2” Coupon holder – multi chuck

Extensions (other than standard)

Plastic Sleeve or Envelope

➤ Prices of all coupons include:

Surface preparation, serial no., weighed and packed in

VCI envelopes

➤ Special metals and coupons upon request

*Subcontracted

MISCELLANEOUS / SPECIAL STUDIES

- Asbestos*
- B.T.E.X.* (In Soil or Water)
(In Glycol w/TPH)
- Base/Neutral & Acid Extractables*
- Carbon Dioxide (pH Titration)
- Carbon Distribution*
- Cold Spot – per chamber
- Compatibility of 2 Brines
- Corrosion Inhibitor / partition test – per chamber
- Fingerprint Analysis*
- Membrane Filter Analysis
- Odor
- Particle Size Distribution:
Microscopic
Sieve
- Paint Chip Analysis (Total Lead)
- PCB's (EPA approved test kit)
- PCB's* (In Soil)
(In Water)
(In Oil)
- Pesticides & Herbicides*
- Qualitative GC Scan with FID Detector
- NORM (RA 226 & RA 228)*
- RCI (Reactivity, Corrosivity, Ignitability)*
- Solids Identification / Scale Analysis:
Qualitative
Quantitative
- TCLP * (with RCI and Pesticides & Herbicides)
(with RCI, without Pesticides & Herbicides)
- TCLP Benzene*
- TCLP Lead
- TCLP Metals
- TCLP Extraction
- Total Toxic Organics (TTO)*
- Total Organic Halogens (TOX)*
- Total Petroleum Hydrocarbons (TPH)*
- Volatile Organic Compounds*

*Subcontracted

FIELD SERVICES

➤ Field Time – Hourly Rates:

Technician: Weekdays (8am to 5pm)

Weekends and Overtime

Chemist: Weekdays (8 am to 5pm)

Weekends and Overtime

➤ Weekend Callout for Lab Analysis

➤ Direct Expenses:

Mileage - per mile

Meals, Lodging, etc.

LAB SUPPLIES

➤ Beakers

50 mL Glass

150 mL Glass

250 mL Glass

400 mL Glass

600 mL Glass

1,000 mL Glass

1,000 mL Plastic

➤ Graduated Cylinders

10 mL Glass

25 mL Glass

25 mL Glass (Red-Stripe)

50 mL Glass

100 mL Glass

1,000 mL Glass

➤ Separatory Funnels

125 mL Glass

250 mL Glass

500 mL Glass

1,000 mL Glass

2,000 mL Glass

500 mL Plastic

➤ Chemicals

4 oz. Dilute Hydrochloric Acid

8 oz. Dilute Hydrochloric Acid

32 oz. Dilute Hydrochloric Acid

Gallon Dilute Hydrochloric Acid

Gallon Muratic Acid

Gallon TF Solvent / Freon

Gallon Hexane

Quart Vertrel

Quart AK 225

LAB SUPPLIES (cont'd.)

➤ Bottles

- 6 oz. Sani-Glass Bottles (48/case)
- 32 oz. Glass Quart Bottles (each)
- 32 oz. Glass Quart Bottles (12/case)
- 4 oz. Plastic (narrow mouth)
- 8 oz. Plastic (narrow mouth)
- 16 oz. Plastic (narrow mouth)
- 32 oz. Plastic (narrow mouth)
- 32 oz. Plastic (wide mouth)

➤ Miscellaneous

- Empty 4 pack Box
- pH Test Strips (100/pack)
- Disposable Gloves
- Silica Gel (quart)
- Silica Gel (4 oz.)
- 500 mL Squeeze Bottle
- 500 mL Squeeze Bottle (red) for ACID
- pH Buffer (quart)
- Pocket Pal pH Tester
- Pocket Thermometer
- SRB / APB Vials
- Pre-weighed Membrane Filters
- Filter Paper (100/box)
 - Fisherbrand
 - Whatman
- Phase Separator (Advantec)

TEST KITS

- HACH Chlorine Test Kit (CN-66)
 - Powder Pillows for Test Kit (100/pk)
 - Viewing Tube for Test Kit (2/pk)
- HACH Chloride Test Kit (5,000 – 100,000 ppm)
- Dissolved Oxygen Test Kit

ANALYZERS & SUPPLIES

➤ MIRAN I FF (FOXBORO)	
	Quartz Cuvette
	Calibration (Generic Oil)
	Calibration (Crude from Customer)
	Power Cord
	Calibration Standards
➤ DURATECH DTIR ANALYZER	
	Quartz Cuvette
	Calibration (Generic Oil)
	Calibration (Crude from Customer)
	Power Cord
	Calibration Standards
➤ INFRACAL ANALYZER	
	Calibration (Hexane)
	Calibration (AK 225)
➤ TURNER TD 360 Oil & Grease Analyzer	
	Calibration
➤ FCI PETROSENSE Oil & Grease Analyzer	
	Calibration
	Spray Bottle
	MSR Filter Assembly w/Carbon Filter
	Carbon Replacement Filters
	Fiber Cleaning Solution (gallon)
	Sample Tubes
	Maintenance Kit – MSR Pump
➤ REPAIRS	Hourly Rates (2 hour minimum)
	Repair Estimates (applied to bill if repaired)
➤ LABORATORY GLASSWARE PACKAGE	
	start-up kit for new Infrared Analyzers
	each item may be purchased separately
	250 mL Separatory Funnel w/Stopcock & Top
	Support Ring (for Separatory Funnel)
	Support Stand (6" x 9")
	50 mL Beaker (4)
	250 mL Beaker
	50 mL Graduated Cylinder
	25 mL Red-Strip Graduated Cylinder
	Short Stem Funnel
	Generic Brand Filter Paper
	15% Hydrochloric Acid (quart)
	TF Solvent / Freon (gallon)
	Transfer Pipette (plastic droppers) (2)
	TOTAL

NOTES

Sample containers, bottles, and tags are provided at no charge if returned to Petroleum Laboratories, Inc.

Quality Assurance records are kept at our laboratories and are available for inspection by our customers.

For those who have NPDES permits, we will prepare quarterly DMR reports for a minimal fee.

TERMS: NET 30 DAYS

Prices subject to change without notice.

Samples shipped to us "Collect" will be accepted. Such transportation charges will be added to our laboratory charges with a receipt attached to our original copy of the invoice.

Chemical solutions and supplies by quotation.

Additional charges may be charged for:

Disposal Cost

Excessive H₂S

Sample Preparation

Shipping

Normal turnaround time for analytical services is 3 – 5 days. Additional charges will apply for rush services at the following rate:

Same Day	100% upcharge
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24 Hour Turnaround	75% upcharge
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48 Hour Turnaround	50% upcharge
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Minimum Invoice charge \$ 10.00

Quantity discounts available

Where applicable, analysis are determined as outlined in current editions of Standard Methods, EPA, API, ASTM, USDA, or NACE.

Lab Supplies pricing may vary due to changes in PLI's supplier cost