

# Fuel Analysis Laboratories in or bordering Washington State



**Competitive Fuel Analysis Contract**

January 7, 2009

Prepared by Washington State Department of Agriculture,  
Weights and Measures

# Deliverables

## Gasoline Fuel Lab Deliverables

- Gasoline fuel analysis reports received within 48 hours, excluding any Cetane test.
- Electronic report sent via email to WSDA.
- Invoice must include WSDA Sample ID. Billing must match the establish test package costs.
- Establish one test package based on gasoline fuel type.
- Option Item
  - Exception to Test Packages: Fuel analysis processed to inspector's specifications and billed separate from test package.
- Identify what fuel analysis supplies will be included in contract and costs per quantity.
- Identify shipping methods and costs per quantity.
- Length of contract to be designated as one year, reassess our test package after 1 year and amend contract if necessary.

## Diesel & Biodiesel Fuel Lab Deliverables

- Diesel & Biodiesel fuel analysis reports received within 48 hour, excluding any Cetane test.
- Electronic report sent via email to WSDA.
- Invoice must include WSDA Sample ID. Billing must match the established test package costs.
- Establish test packages based on fuel type. Test packages are a collection of nationally approved standards and additional test required by WSDA.
- Option Item
  - Exception to Test Packages: Fuel analysis processed to inspector's specifications and billed separate from test package.
- Identify what fuel sampling supplies will be included in contract.
- Identify shipping methods and costs per quantity.
- Length of contract to be designated as one year, reassess our test packages after 1 year and amend contract if necessary.



# Monitoring Plan

## **Weekly review of electronic fuel analysis reports**

- Review for test package required specifications, email lab to identify missing results
- Review for report accuracy, out of specification results are highlighted appropriately
- Weekly phone calls to identify problems with samples or inspector required sample procedures, document phone conversation with email
- Monthly reports must be received with WSDA Sample IDs and Certification of Analysis numbers
- Random phone calls to discuss concerns or changes, document phone conversation with email.

# Identified Risks

## **Inaccurate fuel analysis reports**

- Misdirects staff in enforcement actions
- Delays lab analysis reports being
- Loss of trust and confidence in laboratory accuracy

## **Missing fuel analysis reports**

- Delays lab analysis reports being sent to businesses
- Delays inspector action based on specifications not report in lab analysis reports

## **Lost fuel samples**

- Inspector time is doubled for re-sampling fuel
- Loss of business confidence regarding the accuracy and responsibility of our fuel analysis

## **Fuel analysis equipment calibration**

- To verify results are reproducible, run same fuel sample as two samples with two separate Sample IDs. Compare results to verify sample results reported.
- To verify results are accurate, run same fuel sample through two separate labs with separate Sample IDs. Compare results to verify sample results are closely similar.
- If laboratory repeatable reports unreliable data, clause to terminate contract.



## Agency Mission

[RCW 19.112.140](#) Standards for biodiesel fuel/fuel blend with biodiesel fuel – Rules. We are charged with maintaining standards for biodiesel fuel or fuel blended with biodiesel fuel according to the Annual Book of American Society of Testing and Materials (ASTM) standards and EPA standards.

WSDA tests the quality and quantity of fuel being sold throughout the distribution system. We test on a random, quarterly and as needed basis to address any fuel quality concerns. Weights and Measures currently has 14 field inspectors and will likely run between 400-500 biodiesel fuel analyses per year. As the biodiesel fuel market increases so will the number of locations that will need to be inspected.

Gasoline samples are projected to be 500 samples per year. Diesel samples are projected to be 100 samples per year. Reporting fuel quality is one way we can protect consumers and fulfill our agency's mission.

Estimated cost biodiesel samples per year \$240,000 – 300,000 (\$600-700 per test)

Estimated cost diesel samples per year \$ 63,000 (\$630 per test)

Estimated cost gasoline samples per year \$ 315,000 (\$630 per test)

## Evaluation Team

Mark Gaffney, GA

Rebecca McAferty, WSDA

Kirk Robinson, WSDA

Larry Oline, WSDA

John Megow, City of Seattle

## Other Requests/Requirements

GA please include a voluntary pre-bid conference available to all potential vendors.

**Requirements:** Laboratory selected must participate in the National Institute of Standards & Technology (NIST) Round Robin Interlaboratory Comparison and make those reports from the round robin available to WSDA staff.

<http://ts.nist.gov/WeightsAndMeasures/Metrology/roundrobins.cfm>

Vendors must include the fuel sampling containers and shipping supplies in their bid for this contract.



# Evaluation Questions for Vendors

## **Electronic File Organization/Email Reports**

WSDA receives over 100 emails a month regarding lab results. Can you incorporate the Sample ID in the subject of each email, in the file name of attached documents and on the actual report itself?

WSDA's key id is the Sample ID, is consists of our inspector's initials, the date (MO, DD, YY or YYYY) and the sample number. Knowing that it is the primary and key id to connect the lab results with our sample information, what can you do to make sure our Sample ID is predominant in email and file naming procedures.

Example: RM 10152008-1

## **Equipment for Test Methods**

Do you have the required ASTM equipment to perform the specified ASTM properties and methods?

## **Turn Around Time**

For normal turn around time, can you submit the lab results, electronically in 24 hours turn around time? For retests, can you submit a new COA or with a clearly identified revision to an existing COA.

## **Lab Staff Contact Information**

Timeliness and Responsiveness: Does the Bidder respond to questions technical and address concerns within 24 hours or less?

## **Payment**

- Process payments to vendors using Visa account.

## **Lab Report Access**

- Web application to view reports
- Printed reports
- How do you record each result of the fuel analysis on the lab report? Is there a print out from each piece of equipment and then a staff person enters the results. What measure have you implemented to check for typographical errors?



## Instructions for vendors interested in open competition for fuel contract

Interested parties must register through Department of General Administration, Office of Procurement, Washington Electronic Business Solutions (WEBS) online vendor registration application.

New to WEBS, click here <http://www.ga.wa.gov/WeBS/aboutwebs.htm>

Already registered as vendor, log in here, <https://fortress.wa.gov/ga/webscust/>.

Use the Commodity Code & Services Description below.

### **Commodity**

#### **Code**

**9758**

#### **Services**

#### **Laboratory Testing & Analysis Services**

#### **Description:**

Includes laboratory testing and analysis services for water treatment, chemical, petroleum, pharmaceutical, medical, veterinary, and wildlife.

#### **Keywords:**

group 97, purchased services, oil, analytical, 99226,

Vendor registration or WEBS questions, call (360) 902-7400.



# Fuel Testing Laboratory Candidates



## Gasoline Testing Laboratories

- **Saybolt | Core Laboratories** – Dreyfus Brown  
18251 Cascade Ave, S, Tukwila, WA 98188  
(425) 656-3663  
\* Also performs diesel testing.
- **Intertek | Caleb Brett** – Jon Stewart  
801 W Orchard Drive, Suite 5, Bellingham, WA 98225  
(360) 671-0919  
\* Also performs ethanol testing.



## Biodiesel Testing Laboratories

- **FuelOnly** – Malala Pou  
14413 NE 10<sup>th</sup> Ave, Suite B-104, Vancouver, WA 98685  
(360) 546-3835
- **Inspectorate** – Jesse Diaz  
2501 SE Columbia Way, Suite 300, Vancouver, WA 98661  
(360) 574-7060
- **Gorge Analytical** – Jeff Fetkenhour  
1107 13<sup>th</sup> Street, Hood River OR 97031  
(541) 980-7168
- **Intertek | Caleb Brett** – Jon Stewart  
801 W Orchard Drive, Suite 5, Bellingham, WA 98225  
(360) 671-0919  
\* Also performs diesel testing.
- **Saybolt | Core Laboratories** – Dreyfus Brown  
18251 Cascade Ave, S, Tukwila, WA 98188  
(425) 656-3663
- **Lab/Cor Materials, LLC** – Robert Fisher  
810 NW 45th Street, Seattle, WA 98107  
(206) 508-1470





## Gasoline ASTM D4814 Tests & Methods

Fuel Type: Gasoline		
Test Name	ASTM Test Method	Ran Individually or as part of package
Water by Karl Fischer** or Water Content	D6304 EN ISO 12937	Package and Individual
Flash Point, PMCC	D93	Package
Octane Number, Research (RON)	D2699	Package
Octane Number, Motor (MON)	D2700	Package
Distillation, 90% Vol Recovery	D86	Package
Methyl Alcohol Ethyl Alcohol Methyl-T-Butyl Ether (MTBE) ETBE TAME DIPE Tert Butanol	D4815	Package
Gravity, API @ 60°F	D1298	Package
Cetane Index (Calc)	D4737/D976	Individual, on request only

\* Saybolt prices for gasoline and diesel testing are currently agreed upon under contract with WSDA.

\*\* Required by WSDA, not required by ASTM.

Vendors must provide prices per package outlined on pages 6-9 in additional to individual tests indicated per fuel type.





## Diesel and Biodiesel B2 – B5 ASTM D975 Tests & Methods

Fuel Type: Diesel and Biodiesel up to B5		
Test Name	ASTM Test Method	Ran Individually or as part of package
Blend Content*	D7371/EN 14078	Package and Individual
Flash Point, PMCC	D93	Package and Individual
Water & Sediment	D2709	Package
Distillation, 90% Vol Recovery	D86	Package
Kinematic Viscosity @ 40°C	D445	Package
Sulfated Ash	D874	Package
Sulfur, ppm max	D5453	Package
Copper Strip Corrosion (No 3 max)	D130	Package
Cloud Point	D2500	Package
Ramsbottom Carbon Residue on 10% Distillation, % mass, max	D524/D4530	Package
Water Suspended by Karl Fischer* or Water Content	D6304 EN ISO 12937	Package or individual
Dye Concentration	ASTM D6258	Individual, on request only
Cetane Number	ASTM D613	Individual, on request only

\*Required by WSDA, not required by ASTM.





## B100 Biodiesel ASTM D6751 Tests & Methods

Fuel Type: Biodiesel B100		
Test Name	ASTM Test Method	Ran Individually or as part of package
Blend Content**	D7371/EN 14078	Package and Individual
Water Suspended by Karl Fischer** or Water Content	D6304 EN ISO 12937	Package and Individual
Flash Point, PMCC	D93	Package and Individual
Total Glycerin Free Glycerin	D6584	Package and Individual
Water & Sediment	D2709	Package and Individual
Distillation, 90% Recovery	D86	Package
Carbon Residue	D4530/D524	Package
Sulfur, Total	D5453/D7039	Package
Cooper Strip Corrosion	D130	Package
Acid Number	D664	Package
Kinematic Viscosity @40°C	D445	Package
Cloud Point	D2500	Package
Sulfated Ash	D874	Package
Oxidation Stability	*EN 14112	Package
Phosphorus Content	D4951/D5185	Package
Sodium & Potassium	EN 14538	Package
API Gravity	D1298/D4052	Package and Individual
Cetane Number	D613	Individual, on request only
Cetane Index (Calculated)	D976	Individual, on request only

\* EN represents the European test method, this test is used until ASTM adopts an approved test method.

\*\* Required by WSDA, not required by ASTM.





### B6-B20 Biodiesel ASTM D7467 Tests & Methods

<b>Fuel Type: Biodiesel Blends B6 – B20</b>		
Test Name	ASTM Test Method	Ran Individually or as part of package
Blend Content	D7371/EN 14078	Package and Individual
Water Suspended by Karl Fischer* or Water Content	D6304 EN ISO 12937	Package and Individual
Acid Number	D664	Package
Viscosity @ 40°C	D445	Package
Flash Point	D93	Package
Cloud Pt, LTFT/CFPP	D2500, D4539, D6371	Package and Individual
Sulfur Content	D5453	Package
Distillation Temp 90% vol	D86	Package
Ramsbottom Carbon Residue	D524/D4530	Package
Ash Content	D482	Package
Water & Sediment	D2709	Package and Individual
Copper Corrosion	D130	Package
Oxidation Stability	EN14112	Package
Cold Soak Filtration (Replaces CFFF)	D6217b	Package
Lubricity	D6079	Package
Dye Concentration	D6258	Individual, on request only
Cetane Number	D613	Individual, on request only



### B21-B99 Biodiesel Specific ASTM Tests & Methods

This is a collection of WSDA required tests for biodiesel blends.

<b>Fuel Type: Biodiesel Blends B21 – B99</b>		
Test Name	ASTM Test Method	Ran Individually or as part of package
Blend Content	D7371	Package and Individual
Water Suspended by Karl Fischer or Water Content	D6304 EN ISO 12937	Package and Individual
Water & Sediment	D2709	Package and Individual
Cold Soak Filtration (Replaces CFFF)	D6217b	Package
Acid Number	D664	Package
Oxidation Stability	EN 14112	Package



## Diesel and Biodiesel Laboratory Shipping Restrictions & Turn Around Times

Name of Company	Shipping Method	Lab results turn around times
Saybolt	FedEx or hand-deliver. Contract includes shipping costs, requestor pays for shipping.	24 hour turnaround once samples received.
Gorge Analytical	Fed Ex & UPS, WSDA pays for shipping	24 hour turnaround once samples received.
FuelOnly	Provides free shipping via UPS *Provides containers, boxes and labels.	12-24 hour turnaround once samples received.
Intertek Caleb Brett	FedEx to gas lab in CA. Contract includes shipping costs, WSDA pays for shipping.	24 hour for biodiesel, 48 hours for gasoline.
Inspectorate	Must bring samples into lab or WSDA pays for shipping. They ship some tests out of state, impacts the turn around time.	24 hour turnaround once samples received. Gas samples shipped out of state, next day results.
Lab/Cor, Inc.		4-5 days turnaround once samples received.

## Type of Fuel & Shipping Method

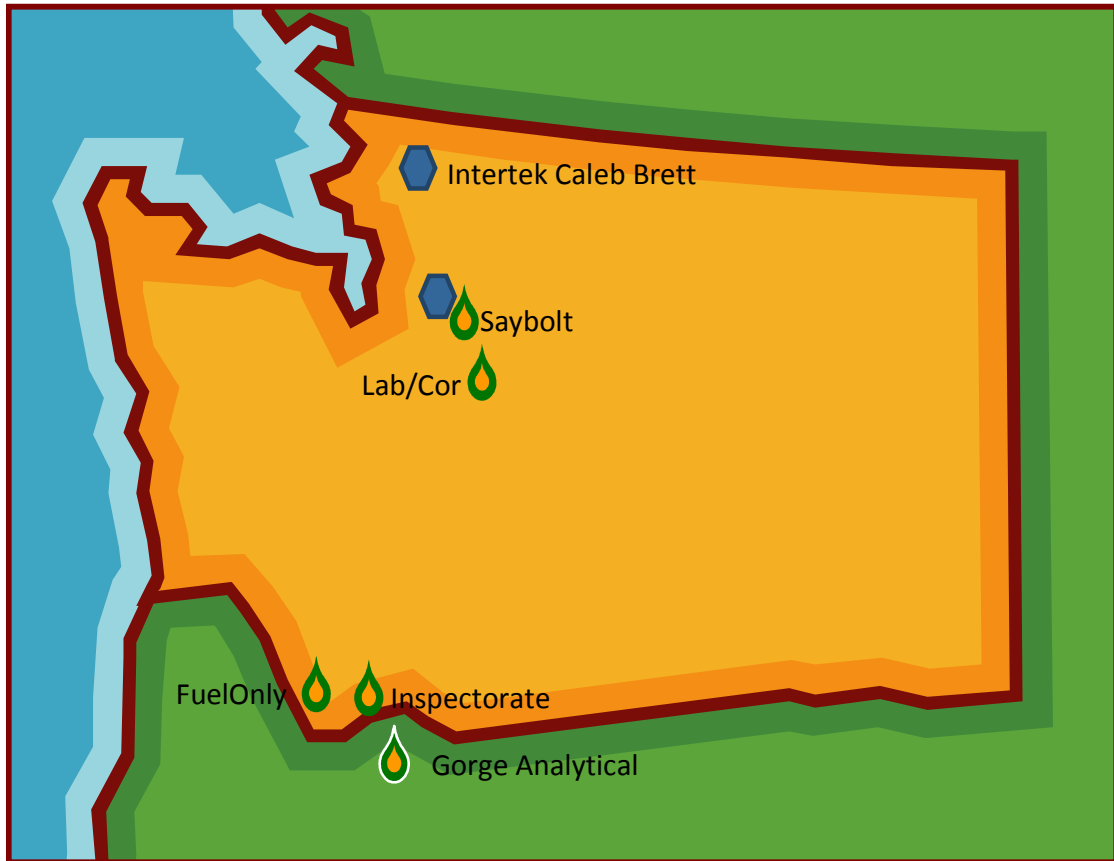
Type of Fuel	Shipping Method
Biofuel	Regular FedEx and UPS
Diesel	Regular FedEx and UPS
Gasoline	CMS for Western Washington and FedEx ground courier through dangerous goods certified inspector for Eastern Washington.

## Methods for Shipping Gasoline

Name of Company	Shipping Method	Description
FedEx	FedEx Ground Inspector deliver to FedEx location or call for pick FedEx pick up.	Strict requirements for shipping dangerous goods, labeling requirements and may incur special surcharges. Packing must meet Federal CFR guidelines. One or two inspectors must be certified as a dangerous good shipper with FedEx (\$600 per person per year) Average cost for shipping gasoline sample approximately \$20.00



## Laboratory Locations in or Bordering Washington State



## All ASTM & EN Methods & Approved Alternative Methods

Primary ASTM Property	Primary ASTM/EN Method	Equipment	Alternative ASTM Property	Alternative ASTM Method	Equipment
Water Suspended by Karl Fischer	EN 12397		Determination of water in petroleum products by coulometric Karl Fischer Titration	ASTM D6304	Coulometric Karl Fischer Apparatus, water vaporizer accessory, syringe
Water & Sediment in middle distillate by centrifuge	ASTM D2709	Centrifuge, centrifuge tube (cone & pear)	N/A		
Research Octane No. (RON)	ASTM D2699	commercial automotive spark-ignition engine	N/A		
Motor Octane No. (MON)	ASTM D2700	commercial automotive spark-ignition engine	N/A		
Alcohols: Methyl, Ethyl Alcohols, MTBE, ETBE, TAME, DIPE & Tert Butanol	ASTM D4815	Chromatograph, data presentation/calculation, two columns.	N/A		
Gravity, API @ 60°F	ASTM D1298	Hydrometer, thermometers, hydrometer cylinder, constant-temp bath	N/A		? ASTM D4052, wait until Jeff Fetkenhour responds.
Distillation 90% Volume Recovery	ASTM D86	Basic components of apparatus, temp measuring device, thermometer, temp sensor centering device, barometer.	N/A		



Calculated Cetane Index	ASTM D4737	Performed upon request only.	Test Method for Cetane Number of Diesel Fuel Oil	ASTM D613	Estimates Cetane number.
Flash Point, Pensky-Martens Closed Cup (PMCC)	ASTM D93	PMCC apparatus – Manual & automated, Temp measuring device, Ignition source, barometer.	N/A		
Blend Determination	ASTM D7371	Mid-IR Spectrometric Analyzer	Determination of FAME	EN 14078	IR spectroscopy
Cloud Pt °C	ASTM D2500	Test jar, thermometers, cork, jacket, disk cork, gasket, bath	N/A		
Kinematic Viscosity @ 40°C	ASTM D445	Viscometer, automated viscometer, viscometer holder, temperature-controlled bath, temp measuring device, timing device.		ISO 3104	
Sulfated Ash	ASTM D874	Evaporating dish or crucible, electric muffle furnace, balance.	N/A		
Sulfur, Total	ASTM D5453	Furnace, combustion tube, flow control, drier tube, UV Fluorescence detector, mircolite syringe, sample inlet sys, direct injection, boat inlet sys, refrigerated circulator, strip chart recorder, balance	Sulfur in Gasoline & Diesel fuel by monochromatic X-ray spectrometer	ASTM D7039	Monochromatic wavelength dispersive X-ray Fluorescence spectrometer, X-ray source, incident-beam monochromator, optical path, fixed channel monochromator, detector, single-channel analyzer, removal sample cell, X-ray transparent film.
Copper Strip Corrosion	ASTM D130	Copper strip corrosion pressure vessel, test tubes, test baths	N/A		



Ramsbottom Carbon Residue on 10% Distillation	ASTM D524	Glass coking bulb, control bulb, sample charging syringe, metal coking furnace, temperature measuring device.	Determination of Carbon Residue	ASTM D189 ASTM D4530	Porcelain crucible, iron crucible, Wire support, hood, insulator. Glass sample vials, eyedropper, syringe, sample vial holder, thermocouple, analytical balance, nitrogen
Total & Free Glycerin	ASTM D6584	Chromatographic sys, gas chromatograph, open tubular column, electronic data acquisition sys.		* EN 14105 not accepted as approved alternate method.	
Carbon Residue	ASTM D4530	Glass sample vials, eyedropper, syringe, sample vial holder, thermocouple, analytical balance, nitrogen	Conradson Carbon Residue Test	ASTM D189	Porcelain crucible, iron crucible, Wire support, hood, insulator.
Acid Number	ASTM D664	Manual titration apparatus, automatic titration apparatus.		* D974 & D3339 not accepted as approved alternate method.	
Oxidation Stability	EN 14112		N/A		
Phosphorus Content	ASTM D4951	Inductively-coupled plasma atomic emission spectrometer (ICP-AES), analytical balance, peristaltic pump, solvent dispenser, specimen solution containers, vortexer, ultrasound homogenizer	Determination of metals selected elements in base oils ICP-AES	ASTM D5185	Balance, inductively-coupled plasma atomic emission spectrometer, nebulizer, peristaltic pump, solvent dispenser, specimen solution containers, ultrasonic homogenizer, vortexer



Sodium & Potassium, Calcium & Magnesium	EN 14538		N/A		
Cold Soak Filtration (Replaces CFPP)	ASTM D6217	Filtration sys, funnel & funnel base, ground/bond wire, receiving flask, safety flask, vacuum sys, other apparatus	Cold Filter Plugging Point (CFPP) replaced by Cold Soak Filtration	ASTM D6371	Manual apparatus, test jar, jacket, insulating ring, spacer, supporting ring, stopper, pipet, filter unit, thermometer, cooling bath, vacuum source, vacuum regulator, stopwatch, automated apparatus, vacuum pump

