

## St Johns County, Fl Biodiesel Facility

Myths and Challenges RJ Inman, Biodiesel Department (904) 209-0291

EPA Biodiesel Workshop – October 14 - 15, 2009

#### Background

- St Johns County population is 181,000 & covers 609 sq miles
- St Johns County started their biodiesel production facility in 2005
- St Johns County collects waste vegetable oil from restaurants, schools, correctional facilities, and homes
- St Johns County uses biodiesel in emergency vehicles, commuter buses, and other County vehicles
- St Johns County has saved \$\$ using biodiesel versus purchasing ultra low sulfur diesel

#### 5 Myths Regarding Biodiesel

- The raw feedstock for making biodiesel is hard to find and is expensive to purchase - <u>False</u>
- Biodiesel voids manufacturers vehicle warrantees <u>False</u>
- Biodiesel is not environmental friendly and pollutes the air and water - <u>False</u>
- Biodiesel is more expensive to produce than to purchase ultra low sulfur diesel at the pump - <u>False</u>
- All biodiesel is the same <u>False</u>

The raw feedstock for making biodiesel is hard to find and is expensive to

purchase - False

St Johns County collects waste vegetable oil (WVO) from:

- ≥35 restaurants
- **≻**Local County Schools
- > Residential drop off locations
- **≻**Correctional Facilities
- ➤ Naval Air Station

St Johns County picks up the WVO for free as a community service

Pretreatment of WVO to reduce free fatty acids and water content is necessary before making biodiesel



WVO Collection Vehicle



Vacuum Distillation System



Acid Esterification System

## Biodiesel voids manufacturers vehicle warrantees - <u>False</u>

 Biodiesel has excellent lubricity characteristics and extends the life of the engine

Manufacturers of vehicles will honor warrantees if B20 is used in vehicles that meet ASTM D 6751

specifications

 Since biodiesel acts as a cleaning agent fuel filters are changed after initial use of biodiesel



# Biodiesel is not environmental friendly and pollutes the air and water - False

- Biodiesel is a cleaner burning fuel than ultra low sulfur diesel (reduces green house gasses)
- A County biodiesel facility associated with a Fats, Oils, & Grease (FOG) program at a publicly owned treatment works can reduce water pollution by reducing FOG related Sanitary Sewer Overflows (SSOs)
- According to EPA, 47% of SSOs caused by line blockage are FOG related episodes





## Biodiesel is more expensive to produce than to purchase low sulfur diesel at the pump – <u>False</u>

- Biodiesel at St Johns County costs less than \$2 per gallon to produce including labor & materials
- Over the past year, St Johns County has enjoyed a significant cost savings in its fuel budget, as a result of producing biodiesel fuel



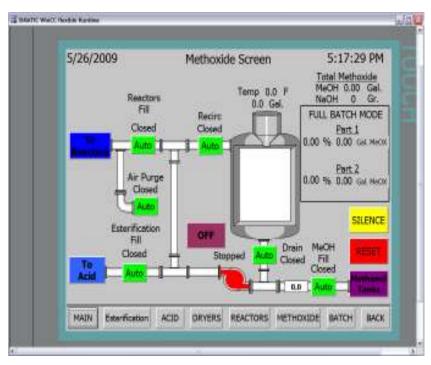
#### All biodiesel is the same - False

 Biodiesel should meet ASTM specifications to ensure quality assurance and engine performance

Biodiesel to meet ASTM D 6751specifications must

meet 18 critical tests

Producing ASTM D 6751
 quality biodiesel at
 St Johns County is aided
 by the use of an automated
 touch screen computer
 system





Test Name	Test Method	Limit	Result	Status
Free Glycerin (mass %)	ASTM D6584	MAX 0.020	0.002	PASS
Monoglycerides (mass %)	ASTM D6584	N/A	0.033	N/A
Diglycerides (mase %)	ASTM D6584	N/A	0.060	N/A
Triglyoerides (mass %)	ASTM D6584	N/A	0.100	N/A
Total Glycerin (mass %)	ASTM D 6584	MAX 0.240	0.195	PASS
Flash Point, Closed Cup (°C)	ASTM D93	MIN 130	121.5	PASS
Methanol Content (wt %)	EN 14110	MAX 0.20	0.022	PASS
Phosphorous (ppm)	ASTM D4951	MAX 10	0	PASS
Calcium + Magnesium (ppm)	EN 14538	MAX 5	CA-0+MG-0=0	PASS
Sodium + Potassium (ppm)	EN 14538	MAX 5	NA-0+K-2=2	PASS
Water & Sediment (vol %)	ASTM D2709	MAX 0.050	0	PASS
Sulfur, by UV (ppm)	ASTM 05453	MAX 15	7.76	PASS
TAN (mg KOH/g)	ASTM D664	MAX 0.50	0.24	PASS
Mecosity @ 40° C (cSt)	ASTM D445	1.9 - 6.0	4.92	PASS
Oxidation Stability by Randmat (hrs)	EN14112	MIN 3.00	3.18	PA88
Dist. Temp., 90% Recovery (°C)	ASTM 01160	MAX 360	356	PASS
Cetane Number	ASTM D613	MIN 47	56	PASS
Cloud Point (°C)	ASTM D2500	N/A	0	N/A
Cold Soak Filterability, Time (sec)	ASTM D6751 Annex A1	MAX 360	44	PASS
Sulfilled Ash (wt %)	ASTM D874	MAX 0.020	<0.005	PASS
Carbon Residue, MicroMethod 100% (wt %)	ASTM D4530	MAX 0.050	< 0.05	PASS
Copper Corrosion, 3h @ 50°C (rating)	ASTM D130	MAX 3A	1a	PASS

<sup>\* 8</sup> Plack Port is between 80 °C and 129 °C. Methani Contart (MC) exact as leated. MC result repail to lower than 0.30 (wffs) to PASS.

CERTIFICATE OF ANALYSIS
Analysis Meets Testing Requirements of ASTM D 6751.



Finished B100 Biodiesel



Waste Vegetable Oil

#### Challenges

- Funding Biodiesel Projects
  - St Johns County used funds from the fuel Department diesel budget to build the biodiesel facility
  - Funds are available through State Revolving Fund programs when biodiesel facility is associated with a publicly owned treatment works (POTW) FOG program
  - Funds are available through the Green Initiative under the American Recovery Reinvestment Act of 2009
  - Educating the public and community leaders that using biodiesel is a step in the right direction – reduces county fuel costs, reduces air & water pollution, and our dependence on foreign oil

#### St Johns County Awards

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#### IDEA/INNOVATION OF THEY EAR FALL 2007

#### ST. JOHN'S COUNTY, FLORIDA BIODIESEL

Biolicsel is the name of a clean burning alternative fact, produced from domestic, renewable resources. Biodirect contains our permitture but it can be blooded at any fired with petroloum direct to greate a biodirect blood It can be used an compression signature (diesel) engines with lattle or no modifications. Budiesel in simple to use bridgesdable, metrosic, and essentially free of suffer and aromatics.

Busheed is made through a chemical previous called transmitted fronting wherehe the glacerist is expected from the lat or vegetable oil. The process leaves behind two products, methyl esters (the chemical name for biodiesel) and glovering a valuable hyperduct usually used in stages and other products.

Through the efform of all involved to creating the first site within the ELAGEA organization. St. John's County began printing their own biodicael during a time when the efficiency of biodicael was still unknown to many ly max risk that created them not only a savings in the cost of hirly bit a community commitment to support their efforts to become less dependent on found facts and foreign oil. St. John's County has not only less their expertise to those that have since looked into or have established their own time, but they have also shared with our organization the marketing skills needed to make the victorie successful. Britisgle planning community to observe mout and marketing are all important elements to occose.

HAGEA CONGRATULATES ST. JOHN'S COUNTY, WINNING OF "THE IDEA AND INNOVATION OF THE TEAR" EALL, 2007.



Joe Stephenson, Director of Public Works, St Johns County receives the Fall 2007 "Idea/Innovation of the Year Award" from the Florida Association of Government Fleet Administrators (FLAGFA) for the St. John's County, Florida biodiesel facility

### St Johns County Awards



2008 National 1st Place
Clean Water Act Recognition Award
for Pretreatment Program Excellence
0-5 SIUs

Presented to

St. Johns County Utilities Pretreatment Program St. Augustine, Florida



October 20, 2008

Stephen Dohnson Administrator



St Johns County receiving the EPA 2008 National & Regional Clean Water Act Recognition Award for Pretreatment Program Excellence 0-5 Significant Industrial Users

### Questions?







