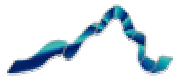




Biodiesel Implementation – Arlington County, Virginia

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Virginia's Center for
Innovative Technology



Virginia Natural Gas

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Arlington County's B20 Project History

It began with citizens calling members of the Arlington County Board to raise concerns over the plume of exhaust that appeared every morning at 6 AM above the County's school bus parking lot. Growth in the area had resulted in new homes and townhouses just outside the facility.

Another unrelated event also resulted in calls to the Board members. A fire engine belched forth a cloud of smoke as it rounded a corner and accelerated. The citizens standing on the corner were left with blackened faces. Again, more calls to Board members were made.

Ric Hiller, Chief in the Department of Environmental Services, was contacted by the Board and asked, "Is there something that can be done?" Ric's response was "Yes, biodiesel". With the full support of the Board, Ric and his team began the process of implementing this new and cleaner burning fuel.

Chief Hiller is quick to point out that those who implement biodiesel today will have an easier go of it. The biggest hurdle at the time was finding a relatively local source for this, at the time, rare fuel. The operational implementation was a much simpler process.

Arlington began using B20 in its fleet of diesel powered school buses and other vehicles in September of 2001. Fleet management personnel report a dramatic reduction in particulate emissions and the early morning startup plume that precipitated citizen's concerns and ultimately the adoption of B20.



Arlington County School Bus Lot - Biodiesel makes vehicles and townhouses a better mix.

Fleet Profile

Arlington's school bus fleet numbers 138 vehicles, all of which are fueled with B20 (diesel fuel blended with 20% B100 (100% biodiesel). But, these are not the only County vehicles running on B20. In fact every vehicle and piece of equipment with a diesel engine is running on B20 with the exception of compressors and generators that sit idle and unused for long periods of time. These engines are fueled with conventional diesel because it is viewed as having a longer shelf life.



Arlington County School Bus – The Arlington County Fleet is varied by make, model and year, including very recent acquisitions and buses that are ten years old. (See Appendix A for a complete list)

Vehicles Inventory

The following chart is a **sampling** of vehicles in Arlington County's fleet that run on B20. A complete list of Arlington's biodiesel powered fleet is available in Appendices A (school buses) and B (other B20 fueled vehicles).

Type	Manufacturer	Model	Year
School Bus	Navistar	Vista	Various 90's and 00 model years
School Bus	Thomas	Saf-T-Liner and Transit	Various
School Bus	International	FE SB and RE SB	2004

Type	Manufacturer	Model	Year
School Bus	Ford	F350	
Fire Truck – Pumper	E-One	Cyclone	2001, 2002
Backhoe	Case	590	1996,1997
Small Bus	Ford	E450	2000
Small Buss	Diamond Corp	Trolley	1998
Backhoe	John Deere	710D	2000
Pickup	Ford	F350	2003
Dump truck	Volvo	WG64	2000
Leaf collector	IHC	CO-1950	1986
Leaf collector	Freightliner	FC80	2003
Loader	Caterpillar	950G	2002

Representative list of the broad assortment of vehicle types and manufactures that Arlington County operates on B20. Note, a complete list is provided in Appendices A and B.

Arlington fuels all of its diesel powered vehicles with B20 including its fleet of school buses, emergency vehicles, construction equipment, environmental vehicles, transit buses, and light trucks. Arlington’s operations and maintenance personnel reported no discernible difference in vehicle performance and readiness when utilizing B20.

Also noteworthy, Arlington is replacing pickup trucks fueled with Liquid Propane Gas (LPG) with diesel powered pickups that will be fueled with B20. These vehicles are used primarily to supplement snow removal capacity. The switch was precipitated by two events in which the LPG vehicles caught fire and burned while plowing snow. The decision was made to switch to diesel based in part on the greater torque that diesel engines produce. In addition, fleet management pointed out that, in their experience, biodiesel vehicles have the following advantages over LPG vehicles:

- Fewer mechanical problems
- Less maintenance
- Better mileage

Engines

The previous section provided a sample of the wide variety of vehicles that Arlington fuels with B20. Fleet management personnel also provided the following list of engines with which they have B20 operational experience. This list is a representative subset and not a complete inventory of engine models.

Manufacturer	Engine
Caterpillar	3126 3116
Cummins	B series C series

Detroit	8.2 Liter Series 60
Ford	Power Stroke
International	DT 466 7.3 Liter

This table provides a sampling of the diesel engines that Arlington County is running on B20.

Arlington County personnel report no maintenance, performance, or reliability problems with any of the engines they operate on B20. Indeed, mechanics reported that they were pleasantly surprised that they could discern no cause and effect relationship between any specific maintenance issues and the adoption of B20. They also expressed that they expected problems with the collection of water in the fuel systems of engines running B20, but this problem has not materialized.



School Bus Engine – Arlington mechanics have experienced no mechanical problems that they can attribute to the adoption of B20

Prior to cutover to B20, Arlington County maintenance personnel reviewed fuel requirements for the engines they had in service. In some cases the operating manual, or warranty manual, either had no reference to biodiesel, or only referred to B5 (5% B100, 95% Diesel). In these situations further clarification was sought from the manufacturer. The following text is from a memo sent by Detroit Diesel to its distributors and received by Arlington County. It sheds some light on how manufacturers viewed biodiesel in January 2001:

“Biodiesel fuel is broadly defined in ASTM specification PS121, however this specification does not restrict feedstock types, nor does it include all the properties necessary to assure trouble-free operation. Detroit Diesel

permits the use of biodiesel derived from virgin soy methyl ester and rapeseed methyl ester when blended up to 20% maximum in diesel fuel. The resulting mixture must meet the fuel properties shown in Table 5 of DDC publication 7SE270.

Little long term use data exists, but concerns from combustion deposits, fuel injection system durability, and accelerated engine oil degradation warrant a cautious approach when considering the use of biodiesel. Failures attributed to the use of biodiesel fuel, or blends of biodiesel will not be cover by the Detroit Diesel product warranty.”¹

The good news is that since 2001, operators like Arlington County have been using B20 and report none of the potential problems that the memo mentions.

Engine Manufacturers

Diesel engine manufacturers have issued statements concerning the use of biodiesel in their products. The complete statements are available on the National Biodiesel Board’s web site at:

http://biodiesel.org/resources/fuelfactsheets/standards_and_warranties.shtm

The use of biodiesel does not void any engine manufacturer’s warranty. However, if a failure can be attributed to the use of biodiesel, as with any fuel, the manufacturer will not accept responsibility for the failure. The manufacturers do recommend, or note, the effects of various blends – but in each case the biodiesel component must meet the standard specifications for the comments to be valid. Since these positions were written, The American Society of Testing and Materials (ASTM) has issued and approved ASTM D6751 for neat (100%) biodiesel.

Manufacturer	Max Blend Recommendation
Caterpillar	B100
Cummins	B5
Detroit Diesel	No Comment
International	B20
John Deere	B5

Caterpillar indicates that all blends of biodiesel for all engines are acceptable, except on some older models – the 3003 through 3034, 3054, 3056 series engines. Care must be taken not to exceed five percent (B5) blends in the older engines.

Cummins notes that they do not expect any engine problems with the blends up to five percent (B5). Caution is advised for higher concentrations.

¹ Memo from Danny E. Larkin, Detroit Diesel Corporation, sent to all distributors worldwide, January 31, 2001.

Detroit Diesel cites potential problems with biodiesel use, but does not indicate a blend level with which they are comfortable.

International recommends a maximum blend of twenty percent (B20) in its suggested guidelines for biodiesel use.

John Deere approves the use of biodiesel blends with biodiesel concentration of up to five percent (B5)

Engine manufacturers are constantly evaluating fuel options and communicating their findings to their customers. The following link on the National Biodiesel Board's web site will provide updated information on the topic and links to copies of memos sent from diesel engine manufacturers to their customers:

http://biodiesel.org/resources/fuelfactsheets/standards_and_warranties.shtm

Emissions requirements, diesel fuel specifications, and fleet operating experience are evolving. As such it is important to remain in contact with engine manufacturers in order to stay in compliance with their operating requirements.

Procedures for Pre-1994 Equipment

Arlington's fleet management staff reported no requirement for deviation from standard operating and maintenance procedures for Pre-1994 equipment.

Fuel for 2007 Engines

The emissions requirements for diesel engines manufactured to meet 2007 standards will require devices such as EGR systems and catalytic converters. In addition, the use of Ultra Low Sulfur Diesel (ULSD) will be mandated starting in 2006. Arlington continues to examine the situation as it relates to B20. Arlington noted that there is a chance that a move to B5 may be necessitated by the changes in the 2007 compliant engines.

The technical definition for biodiesel and biodiesel blends is contained in ASTM D 6751 which summarizes it as: "a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM D 6751." To date most diesel engine manufacturers now support the use of blends up to 20% so long as the B100 is derived from virgin soybean oil. However, the 2007 requirements could change this and Arlington is monitoring the situation carefully.

Arlington fleet management suggested that they expect that the combination of ULSD and biodiesel will provide "the best of both worlds." Both fuels on their own provide environmental benefits with biodiesel providing improved lubricity and detergent

characteristics along with the fact that it is a renewable fuel. Arlington is still looking for definitive information on the impact of burning B20 in 2007 compliant engines.

Grants and Rebates

Arlington submitted for and received a \$500 rebate from the Virginia Soybean Association in 2002. This rebate is offered to anyone who purchases B2 biodiesel and above. The maximum value for the rebate is \$500 and funding is limited. In 2004 the funds had been exhausted but the Association suggested contacting them in their Williamsburg Virginia offices at (757) 564-0153 to get information on the current status of the rebate.

Biodiesel Justification

Arlington implemented biodiesel without significant outside funding support or technical assistance. The County determined that community support for the environmental benefits of biodiesel outweighed the additional fuel costs and provided the needed justification. Furthermore, the switch to biodiesel was viewed favorably because:

- Adoption of biodiesel could be implemented quickly
- Implementation of biodiesel required no infrastructure changes or enhancements
- Implementation of biodiesel did not require special vehicles or vehicle modifications
- Biodiesel enabled the county to easily achieve its objective of utilizing more renewable fuels

It is noteworthy, given Arlington's experience with alternative fuels, that fleet management considers biodiesel the easiest renewable fuel to implement.

Arlington personnel acknowledged that with biodiesel, NOx emissions actually increase slightly – an important consideration for operators like Arlington that are located in non-attainment areas. However, management was quick to express its belief that biodiesel's significant reduction in the emission of particulates, hydrocarbons, carbon monoxide, and carbon dioxide were a more than an acceptable trade-off.

Onsite Handling

Arlington fleet management reported that nothing changed with regard to onsite fuel handling after the adoption of B20. They are quick to point out that one of the benefits of B20 is the simplicity with which it is stored and dispensed. It is important to note that the Arlington County fleet also includes CNG, E85, and LPG vehicles and the county maintains its own storage and fueling infrastructure for each of these. As such, their comments are made against the backdrop of significant experience with other alternative fuels.



B20 Dispenser – Arlington pumps B20 and E85 from this dispenser at its Shirlington facility.

Procedures for Initial Reception of B20

While storing and dispensing B20 required no operational changes, management did stress the following three steps that should be undertaken prior to the cutover to biodiesel:

Prior to receiving the *first* shipment of any type of biodiesel:

1. Thoroughly clean diesel storage tanks
2. Add fuel filters at dispensers, or, if dispensers have fuel filters, switch to < 10 micron filters
3. Inventory additional vehicle and dispenser fuel filters

Biodiesel is a detergent. As such, it cleans every aspect of the fuel infrastructure, from trucks, to pipes, to tanks, to vehicle fuel systems. Cleaning storage tanks before adoption will reduce the initial incidences of clogged fuel filters.

Arlington indicated that the following service provider has experience cleaning fuel storage tanks:

Paul Cunningham
Tanks Direct
Beltsville, Maryland
(301) 595-2000 extension 13

Mr. Cunningham was contacted and expressed the following considerations for tank cleaning:

Tank Accessibility tanks with manhole covers offer easier accessibility and therefore cost less to clean.

Storage and Disposal	timing a tank cleaning to coincide with the lowest possible tank level will reduce or eliminate the need to pump a tank empty and store its contents prior to cleaning. This reduces time and cost.
Cleaning Service	tanks may be squeegeed or thoroughly washed and dried. For biodiesel adoption, Mr. Cunningham suggests cleaning and drying before a tank is returned to service.

The cost for a thorough tank cleaning is between \$5,000 and \$10,000 depending on the combination of factors listed above. If the tanks are accessible and empty, a cleaning may be performed in as little as one day.

Even after a thorough tank cleaning, however, at cutover operators may still experience some increase in filter usage as the entire infrastructure continues to be cleaned by the biodiesel.

Arlington uses the following fuel filter on its biodiesel dispensers:

Filter	Vendor
Cim-Tek Filtration Hydrosorb II 800HS-10 Type 2 Pump Filter PN#:70063 Cost: \$37.00 each	L.A. Fritter & Son 4908 Creston St. Hyattsville, MD 20781 301.773.7800

Arlington reported that because of the preventative measures it undertook, (a thorough tank cleaning and the addition of fuel filters on dispensers) initial filter usage on vehicles was less than expected and current filter usage is at pre-biodiesel levels.

In addition to the steps listed above, drivers were also educated that initially after the cutover to biodiesel there was a potential for a short-term increase in clogged fuel filters. Drivers were instructed that at the earliest onset of sluggish performance, they were to return to the maintenance facility and their vehicle’s fuel filter would be replaced immediately. Fleet management reported that at cutover to B20 they received very few in-service requests for fuel filter replacement.

Fuel Storage Description

Arlington stores pre-blended B20 in two locations. Its Shirlington facility has underground storage capacity for 24,000 gallons. An additional underground tank located at a fire station holds 30,000 gallons.

Storage Tank Considerations

Arlington's storage tanks are underground which provides a level of temperature consistency that above ground tanks do not. Biodiesel blends up to B20 can be stored either above ground or below ground though the preferred method is below ground. Biodiesel is more susceptible to cold weather fogging and gelling than straight diesel, although B20 is less problematic than straight B100. Underground tanks maintain the fuel at a higher temperature and therefore mitigate this problem.



Arlington Fueling Infrastructure – Arlington made no changes to its existing fueling infrastructure except to thoroughly clean underground diesel storage tanks and add dispenser filters prior to receiving the first shipment of B20.

Arlington's B20 supplier suggested that above ground storage of B20 is acceptable so long as the tank's capacity is 4,000 gallons or more. In Virginia, tanks this size or larger have enough mass to retain heat to avoid fogging and gelling problems so long as the supplier adds an anti-gelling compound such as Arctic Flow (a common additive used for straight diesel cold weather handling as well).

B100 Storage and On-site Blending

Another option, one that Arlington has not considered, is on site storage of B100 and local blending. This option increases the sophistication of the operation by necessitating at least three tanks: one for diesel, one for B100, and at least one for the blended product. In addition, the infrastructure to blend diesel and B100 is required.

The benefit to this configuration is the flexibility it provides to blend any form of biodiesel (B2, B5, B20, B100) or no blending at all.

Storage Life

Arlington personnel indicated that they have had no problems storing B20 but that they are careful not to fuel vehicles or machines with biodiesel that are likely to sit unused for periods that significantly exceed more than 30 days. While all fuels degrade with the passage of time, biodiesel's shelf life is less than that of straight diesel. Examples of vehicles that are fueled with straight diesel prior to off-season storage include vehicles such as leaf blowers and snow plows. Also, backup generators and compressors that are used infrequently are stored with straight diesel.

Cold Weather Considerations

Arlington has experienced no cold weather related operating problems. Starting October 1st, the County's supplier adds Schaeffer Lubricant's Arctic Flow additive to the B20 it delivers. Arctic Flow is a liquid additive used in diesel fuel. It emulsifies completely with the fuel and can be used to prevent crystallization and increased wax-paraffin blocking in fuel flow lines and filter systems.

Fleet Weather Procedures

The county's B20 supplier begins adding Schaeffer Lubricant's Arctic Flow additive to B20 that is delivered from October 1st through March 15th. The application of this additive has resulted in no cold weather starting problems. However, Arlington's fleet management staff did note one operational precaution. Snow removal equipment and other engines and vehicles that are not used until after October 1st should be stored empty in the off-season and then fueled for winter readiness after October 1st. In this way Arlington ensures that the fuel in the vehicles contains the Arctic Flow additive and will not gel up as a result of cold weather storage.

B20 Throughput

Arlington reported that in fiscal year 2004 it consumed 602 thousand gallons of B20. This equates to 120.4 thousand gallons of B100. Fleet management expects this number to grow as they replace several vehicles that are fueled with Liquid Propane Gas (LPG) with diesel powered equivalents that will be fueled with B20. These vehicles are used for snow removal, and diesel vehicles provide additional performance and reliability over the LPG vehicles.

Operations Experience

Arlington County has significant operational experience with many different fuel types including E85, Liquid Propane Gas (LPG), and Compressed Natural Gas (CNG). Additionally, Arlington has a fleet of hybrid vehicles. This experience is noteworthy as it gives Arlington a unique perspective on the comparative ease with which an alternative fuel strategy can be adopted based on the fuel type selected.

Steps for Adoption

Arlington's impetus for adopting B20 was simplified in that it resulted from citizen requests for a solution to a highly visible environmental problem and it had the backing of the County Board. However, Arlington's fleet management staff pointed out that there are risks achieving driver buy-in associated with the switch to biodiesel if careful planning is not performed. The biggest risk identified by Arlington is the natural aversion that people have to change rather than the potential for technical or operational problems.

Arlington suggested that an initial step in adopting B20 is the creation of a project team comprised of the following personnel and associated responsibilities:

Team Member	Role
Senior Advocate	Liaison to drivers, mechanics, and other parties in the organization, who can communicate the benefits and rationale for utilizing biodiesel and is credible enough to set reasonable expectations for its adoption.
Purchasing Manager	Individual who can locate, negotiate, and coordinate with biodiesel suppliers.
Maintenance Manager	Liaison to mechanics, keeping them abreast of the status of the project. Verify with engine manufactures that engines running on the blend of biodiesel selected will be covered.
Parts Department Manager	Ensure that additional fuel filters are available at cutover
Fuel Manager	Coordinate fuel tank cleaning prior to arrival of first biodiesel delivery and ensure that biodiesel dispensers have adequate filtering.

Filter Plugging Experience

Arlington was proactive in preparing for the adoption of biodiesel by cleaning storage tanks and switching to <10 micron fuel filters on its dispensers. As such, it reports that there was no unexpected rise in vehicle fuel filter plugging or usage after adoption of B20. Indeed, fleet management believes that due to B20, it may be able to extend the fuel filter replacement interval on vehicles that receive regular and frequent maintenance. School buses receive maintenance every 30 pupil days or 2500 miles.

These vehicles are candidates for an extension of their fuel filter replacement interval, which will be expanded in increments of 30 days.

Preventive Maintenance Routines

Mechanics report that the adoption of B20 did not require any changes to preventative maintenance schedules or routines.

General Observations from Garage Staff and Drivers

Garage staff and drivers have reported no noticeable differences after the adoption of B20 except for the intended benefit: of a reduction in the emission of visible smoke and particulates in diesel exhaust.

Equipment Repairs After B20 Adoption

Arlington's maintenance staff, mechanics, and parts department reported that they could discern no change in the types of repairs that they have made since adopting B20 that could be directly attributable to utilizing B20. They admitted that they expected an increase in the incidence of and type of repairs performed on diesel fuel systems but were pleased to find that there may have actually been a slight reduction in such problems, perhaps owing to biodiesel's added lubricity and detergent properties.

Drivability Observations

Arlington's fleet management staff concedes that there is a slight theoretical degradation in vehicle performance after the adoption of B20. They suggest the drivers probably have not noticed the difference and that none have complained about it.

Fleet management noted that a mechanic drove a large truck to Richmond and was "up against the governor" while on the highway. The mechanic refueled with conventional diesel prior to returning to Arlington and was able to maintain highway speed with a lower throttle setting.

Arlington is an urban environment where, like rural environments, highway driving is infrequent, and then, only for short distances. Drivers have not reported performance problems and fleet management attributes this to the type of driving: speeds that rarely approach highway levels.

Biodiesel Fleet Fuel Economy

Due to limitations in its fleet management system, Arlington does not currently track fuel mileage. Changes are being made to the system so that the County can track this information and it expects to find that there is a small reduction in mileage attributable to biodiesel. However, other reports from fleet operators suggest that mileage is likely to

be slightly less to slightly better when using B20. The National Biodiesel Board reports that:

“Biodiesel has a higher cetane number than U.S. diesel fuel. In more than 50 million miles of in-field demonstrations, B20 showed similar fuel consumption, horsepower, torque, and haulage rates as conventional diesel fuel. Biodiesel also has superior lubricity and it has the highest BTU content of any alternative fuel (falling in the range between #1 and #2 diesel fuel).”²

Environmental Benefits

Arlington does not possess the equipment necessary to test emissions on diesel powered vehicles and to date there is no requirement to do so. However, fleet management, mechanics, and drivers have observed a dramatic reduction in visible exhaust and the production of particulates. The early morning plume of smoke that rose above the school bus parking lot is gone and pedestrians no longer complain about being covered with soot when a fire truck accelerates around the corner on which they are standing. Citizen concerns about diesel powered vehicles have abated.

Emissions Estimate

Arlington County’s Energy Manager, John Morrill does estimate the benefit of using B20 based on emissions numbers for B20 published by the Environmental Protection Agency. Mr. Morrill reports high confidence that B20 provides the following emissions relative to conventional diesel:

Emission	Production Compared to Conventional Diesel
Particulates	-10%
Hydrocarbons	-21%
Carbon monoxide	-11%
Carbon dioxide	-16%
NOx	+2%

In October 2002 the EPA published a report titled: “A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions, Draft Technical Report” in which the following graph appeared:

² National Biodiesel Board, 2004, web site document: http://www.biodiesel.org/pdf_files/Myths_Facts.pdf

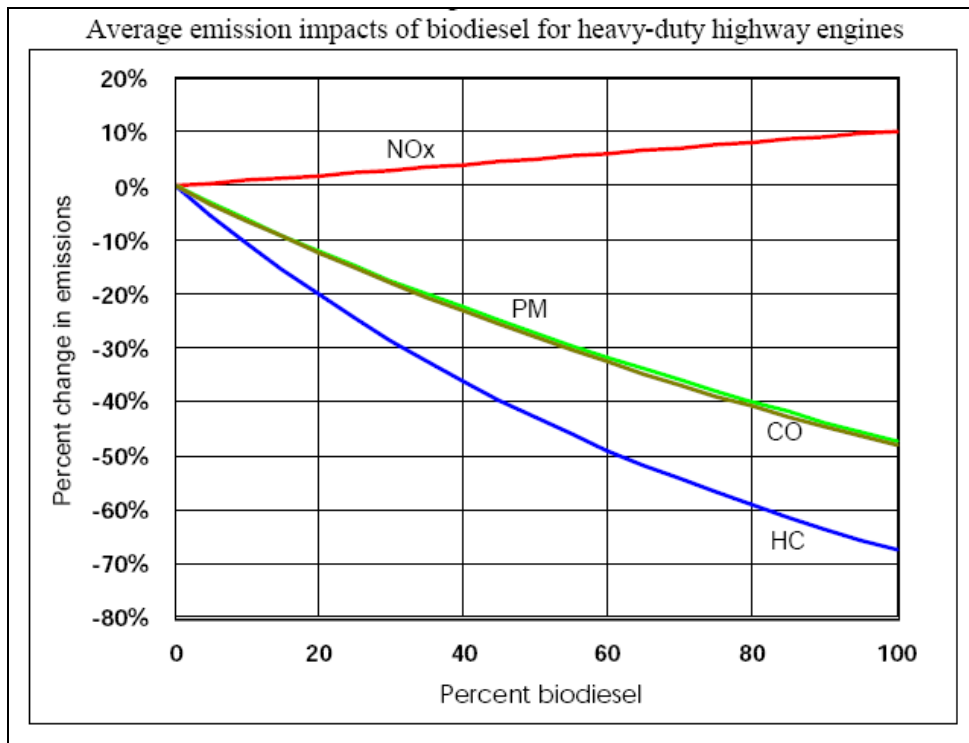


Figure 1 – Source: Environmental Protection Agency, *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions, Draft Technical Report, October 2002.*

The graph shows the emission levels NOx, Particulates (PM), Carbon Monoxide (CO), and Hydrocarbons (HC) for a range of biodiesel blends.

Hazardous Waste Testing

Concerned about the potential for spent gasoline fuel filters to be considered hazardous waste, Arlington sent sample filters to a testing lab for analysis. The lab’s conclusion was that the spent filters are not hazardous waste. Arlington did not have a hazardous waste concern over the spent B20 fuel filters. Arlington crushes used filters and sends them to a recycler.

Fuel Supplier

Arlington County contracts with FleetCor of Norcross, Georgia (770) 449-0479 who subcontracts with Mansfield Oil of Atlanta, Georgia (800) 695-6626, who subcontracts with Tri-Gas Oil of Federalsburg, MD for the delivery of B20 to Arlington County. Tri-Gas has been delivering B20 to the County since September of 2001. Seth Powell of Tri-Gas can be reached at (800) 638-7802.

Tri-Gas receives rail car deliveries of B100 from World Energy Alternatives of Chelsea, Massachusetts’s Lakeland Florida biodiesel plant. World Energy’s representative for Virginia is Bob Gray: (330) 629-2440.

B100 Sources

Appendix C provides a list of National Biodiesel Board Members who supply biodiesel. It is important to note that suppliers maintain relationships with local distributors, so the location of a firm's headquarters will have little bearing on its capacity to deliver biodiesel.

Biodiesel is generally splash blended into the truck that delivers the final product. That is to say the supplier maintains a tank with B100 and a tank with diesel. The customer's order is blended as the truck is loaded to create the product requested (B2, B5, B10, B20).

Though rare, a fleet could order and store B100 and blend it on-site based according to its unique needs. This may offer the advantage of enabling the utilization of more than one biodiesel blend within the fleet. This approach requires a more sophisticated infrastructure and additional handling.

B100 Specification

The following technical description for B100 is based on ASTM D6757, provided by the National Biodiesel Board, and is available on its web site at:

http://biodiesel.org/pdf_files/bdspec.pdf

“Biodiesel is defined as the mono alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, for use in compression-ignition (diesel) engines. This specification is for pure (100%) biodiesel prior to use or blending with diesel fuel. A considerable amount of experience exists in the US with a 20% blend of biodiesel with 80% diesel fuel (B20). Although biodiesel (B100) can be used, blends of over 20% biodiesel with diesel fuel should be evaluated on a case-by-case basis until further experience is available. “

Property	ASTM Method	Limits	Units
Flash Point	D93	130 min.	Degrees C
Water & Sediment	D2709	0.050 max.	% vol.
Kinematic Viscosity, 40 C	D445	1.9 - 6.0	mm ² /sec.
Sulfated Ash	D874	0.020 max.	% mass
Sulfur S 15 Grade S 500 Grade	D5453	15 max. 500 max.	ppm
Copper Strip Corrosion	D130	No. 3 max.	
Cetane	D613	47 min.	

Property	ASTM Method	Limits	Units
Cloud Point	D2500	Report	Degrees C
Carbon Residue 100% sample	D4530**	0.050 max.	% mass
Acid Number	D664	0.80 max.	mg KOH/gm
Free Glycerin	D6584	0.020 max.	% mass
Total Glycerin	D6584	0.240 max.	% mass
Phosphorus Content	D 4951	0.001 max.	% mass
Distillation Temp, Atmospheric Equivalent Temperature, 90% Recovered	D 1160	360 max.	Degrees C

* To meet special operating conditions, modifications of individual limiting requirements may be agreed upon between purchaser, seller and manufacturer

**The carbon residue shall be run on the 100% sample

Delivery and Handling Logistics

Tri-Gas receives railcar loads of B100 at its Federalsburg, Maryland facility from World Energy's Lakeland, Florida manufacturing plant. It stores the B100 in underground tanks that maintain a narrow temperature range throughout the year. B100 is then splash blended into delivery trucks to create, in Arlington's case, B20. Arlington receives the product into two underground storage tanks located at two separate locations in the county. The county uses the same infrastructure that it did prior to the adoption of B20, with the exception of the addition of fuel filters on the fuel dispensers. Drivers fuel their own vehicles.

Fuel Certification

All B100 sold by Tri-Gas to Arlington County is produced from 100% virgin stock soy oil and is certified by their supplier World Energy to conform to ASTM D6751. Tri-Gas will provide on demand, written certification from the manufacturer, World Energy, that the B20 it delivers meets the ASTM specification.

Cold Weather Handling

B100 of soy oil origin will cloud at approximately 30-35 degrees and B20 will cloud at approximately 5-10 degrees. These temperatures will vary as a function of the biodiesel's feedstock (the raw material from which it was made, i.e. soybean oil, animal fat, etc.)

Tri-Gas stores their B100 in underground tanks that preserve the product at 50 to 55 degrees year round. Seth Powell of Tri-Gas indicated that Eastern Virginia winters are

generally warm enough that an above ground tank of 4000 gallons or more is sufficient to keep B20 from gelling so long as it is treated with a cold flow improver such as Arctic Flow.

Starting October 1st and continuing through mid-March, Tri-Gas adds a cold flow improver to its biodiesel. To date Arlington has not reported any problems with B20 gelling.

B20 Certification Procedure and Documentation

Arlington County has no formal B20 certification process and simply accepts its supplier's guarantee that the product it receives (B20) is blended with B100 that adheres to ASTM D6751. Tri-Gas stated that it would provide on demand, written certification from the manufacturer, World Energy, that the B100 it blends to create B20 meets the ASTM specification.

Delivery Frequency and Quantity

Arlington receives weekly truckload deliveries of B20 at its Shirlington Facility and monthly truckload deliveries to its satellite storage facility located at Fire Station #8.

Fuel Pricing and Contracting

A general rule of thumb expressed by Arlington County personnel and their supplier, Tri-Gas, is that biodiesel adds 1 cent per gallon for each percent of B100 in the final blended product. In other words, in 2004 B20, which is 20% biodiesel, costs 20 cents more per gallon than straight diesel.

Another important consideration is the proximity of the biodiesel supplier as transportation can be a significant cost driver.

Arlington's Contract Vehicle

George Barak, Purchasing Agent for Arlington County negotiated and executed the current purchase agreement for biodiesel. Below are several characteristics of the agreement:

Type:	Competitive bid
Term:	10 years with 1 year continuations
Status:	Year 4
Pricing:	Based diesel commodity price as published for delivery at the Fairfax Terminal plus a negotiated markup
Vendor:	Prime contractor is FleetCor. Tri-Gas delivers biodiesel.
Timing:	Product is paid for by Arlington it is pumped into an Arlington County vehicle. FleetCor's FuelMan system manages the tracking

of fueling transactions with cards that are issued to drivers and used at each of Arlington's fuel dispensers.

Important considerations regarding pricing include:

- Proximity to a B20 supplier as it relates to transportation costs
- Customer tank capacity and the ability to accept full truck loads of B20

Arlington is still assessing the impact on pricing that new 2005 tax incentives (see below) will have on biodiesel, but has been told by its supplier that the tax benefit will be passed through to the County.

Arlington provided the following pricing information, shown graphically in Figure 2, for the first eight weeks of the county's fiscal year 2005.

It is important to note that the cost for diesel is recorded weekly by a staff member who notes the price at a local retailer on the way to the office. The price for B20 is the actual invoice price per gallon that Arlington pays for B20. Appendix D provides numerical data and pricing for fiscal years 2004 and 2005.

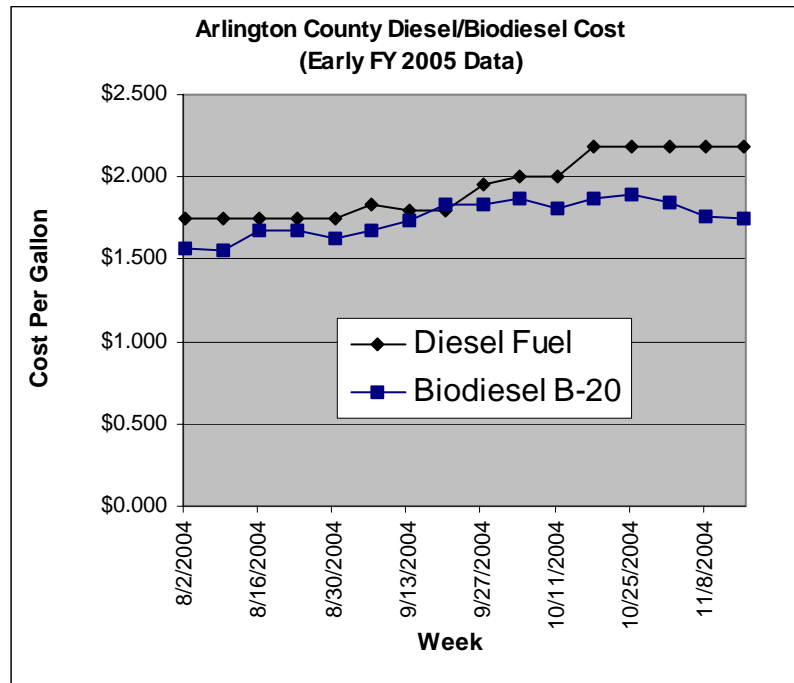


Figure 2 - Local retail diesel cost compared to Arlington's B20 cost.

New Tax Incentives for Biodiesel

The 2004 American Jobs Creation Act of 2004 contains provisions that provide significant tax incentives for biodiesel for the next two years starting in 2005. The provisions are applicable to taxable and tax-exempt fleet fuel programs. It is difficult to say exactly how this will affect pricing, but it appears that supply and demand are both likely to increase significantly in the near term. The Renewable Fuels Association (<http://ethanolrfa.org>) outlined the following provisions of this legislation as it relates to biodiesel:

- Creates a new tax credit for biodiesel: \$1.00 per gallon for biodiesel made from virgin oils derived from agricultural products and animal fats, and \$.50 per gallon for biodiesel made from agricultural products and animal fats;

- Allows the credit to be claimed in both taxable and nontaxable markets, i.e. tax exempt fleet fuel programs and off road diesel markets (dyed diesel);
- Streamlines the use of biodiesel at the terminal rack. The tax structure and credit will encourage petroleum blenders to blend biodiesel as far upstream as possible, which under the Renewable Fuels Standard (RFS) or Minnesota's 2% volume requirement will allow more biodiesel to be used in the marketplace.
- Streamlines the tax refund system for below the rack blenders to allow a tax refund of the biodiesel tax credit on each gallon of biodiesel blended with diesel (dyed or undyed) to be paid within 20 days of blending;
- The alternative minimum tax (AMT) will not be an issue for biodiesel. Any taxpayer eligible for the biodiesel tax credit will be able use the volume biodiesel excise tax credit system, which means they will be able to file for a refund for every gallon of biodiesel used in the marketplace without regard to the income of the taxpayer or whether the [biodiesel] is used in a taxed fuel or tax exempt fuel;
- No effect on the Highway Trust Fund – the biodiesel tax credit will be paid for out of the General Fund not the Highway Trust Fund.³

Conclusion

Arlington County implemented B20 biodiesel as a means to reduce the environmental impact diesel vehicles were having in the county. The impetus came from calls from citizens about the exhaust plume above the school bus parking during morning startup and the visible exhaust from heavy vehicles such as fire trucks. The effort had the support of the County Board.

Arlington's fleet management team prepared for the first delivery of B20 by cleaning storage tanks, adding fuel dispenser filters, and educating drivers on the potential for fuel filter clogging during the early stages of the cutover. In September of 2001, the county received its first shipment of B20. Due to their proactive approach, the implementation went smoothly and the problems anticipated were less disruptive than expected.

Maintenance personnel report no increase in the scope or nature of problems attributable to using B20. Likewise, drivers have not complained about or reported drivability issues. Storage and pumping of B20 is facilitated in Arlington's underground storage tanks with no modifications except for the addition of dispenser side fuel filters.

Overall, Arlington's fleet management staff expressed satisfaction with biodiesel. Their views take on added significance given their experience with a wide array of alternative fuel vehicles. The Arlington team had no reservations recommending to other fleet managers the adoption of biodiesel for all types of diesel powered vehicles.

³ Renewable Fuels Association, 2004, web site link: http://ethanolrfa.org/leg_position_jobshell.shtml

Appendix A – Arlington County Biodiesel School Bus Fleet

EQUIPMENT LIST BY FUEL TYPE (BIODIESEL) SCHOOL VEHICLES

EQ.NO.	YEAR	FUEL	MAKE	MODEL	EQ. TYPE	DEPT.	DEPT. DESCRIPTION
8001	1996	B20	NAVISTAR	VISTA	1996NAVIVIST	801SH	SMALL SCHOOL BUS
8002	2000	B20	THOMAS	SAFTLINE	2000THOMSAFT	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8003	1996	B20	NAVISTAR	VISTA	1996NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8004	1995	B20	NAVISTAR	VISTA	1995NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8005	2003	B20	THOMAS	SAFTLINE	2003THOM0908	801SH	SMALL SCHOOL BUS W/LIFT
8006	2002	B20	THOMAS	0908S	2002THOM0908S	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8007	1991	B20	FORD	CONVENTI	1991FORDCONV	801SH	SMALL SCHOOL BUS W/LIFT
8008	2002	B20	THOMAS	0908S	2002THOM0908S	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8009	1995	B20	NAVISTAR	VISTA	1995NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8010	1995	B20	NAVISTAR	VISTA	1995NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8011	2000	B20	THOMAS	SAFTLINE	2000THOMSAFT	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8012	2000	B20	THOMAS	SAFTLINE	2000THOMSAFT	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8013	2003	B20	THOMAS	SAFTLINE	2003THOM0908	801SH	SMALL SCHOOL BUS W/LIFT
8014	2004	B20	IC	FE SB	2004ICFESB	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8015	2004	B20	IC	FE SB	2004ICFESB	801SH	MED SCHOOL BUS TRANSIT W/LIFT
8016	1994	B20	NAVISTAR	VISTA	1994NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8017	1994	B20	NAVISTAR	VISTA	1994NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8018	1995	B20	NAVISTAR	VISTA	1995NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8019	1997	B20	NAVISTAR	VISTA	1997NAVIVIST	801SH	SMALL SCHOOL BUS
8020	1997	B20	NAVISTAR	VISTA	1997NAVIVIST	801SH	SMALL SCHOOL BUS
8021	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8022	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8023	2000	B20	THOMAS	BUS	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8024	1995	B20	THOMAS	TRANSIT	1995THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT

EQ.NO.	YEAR	FUEL	MAKE	MODEL	EQ. TYPE	DEPT.	DEPT. DESCRIPTION
8025	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8026	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8027	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8028	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8029	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8030	2001	B20	THOMAS	130HS	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8031	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8032	2000	B20	THOMAS	BUS	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8033	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8034	1991	B20	THOMAS	TRANSIT	1991THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8036	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8037	1991	B20	THOMAS	TRANSIT	1991THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8038	1991	B20	THOMAS	TRANSIT	1991THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8039	2005	B20	IC	RE SB	2005ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8040	2001	B20	THOMAS	130HS	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8041	2001	B20	THOMAS	130HS	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8042	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8043	2000	B20	THOMAS	BUS	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8044	2000	B20	THOMAS	BUS	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8045	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8046	2000	B20	THOMAS	BUS	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8047	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8049	2001	B20	THOMAS	SAFTLINE	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8050	2001	B20	THOMAS	130HS	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8051	2001	B20	THOMAS	SAFTLINE	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8052	2001	B20	THOMAS	SAFTLINE	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8053	2005	B20	IC	RE SB	2005ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8054	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8055	2001	B20	THOMAS	130HS	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8056	2001	B20	THOMAS	130HS	2001THOM130HS	801SH	LARGE SCHOOL BUS TRANSIT
8057	1992	B20	THOMAS	TRANSIT	1992THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT

EQ.NO.	YEAR	FUEL	MAKE	MODEL	EQ. TYPE	DEPT.	DEPT. DESCRIPTION
8058	1992	B20	THOMAS	TRANSIT	1992THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8059	1991	B20	THOMAS	TRANSIT	1991THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8059N	2005	B20	IC	RE SB	2005ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8060	1992	B20	THOMAS	TRANSIT	1992THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8061	1992	B20	THOMAS	TRANSIT	1992THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8062	1992	B20	THOMAS	TRANSIT	1992THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8063	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8064	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8065	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8066	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8067	2005	B20	IC	RE SB	2005ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8068	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8069	1995	B20	THOMAS	TRANSIT	1995THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8070	1997	B20	THOMAS	TRANSIT	1997THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8071	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8072	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8073	1997	B20	THOMAS	TRANSIT	1997THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8074	1997	B20	THOMAS	TRANSIT	1997THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8075	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8076	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8077	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8078	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8079	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8080	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8081	2003	B20	THOMAS	SAFTLINE	2003THOM130Y	801SH	LARGE SCHOOL BUS CONVENTIONAL
8082	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8083	1991	B20	CHEVROLET	CONVENTI	1991CHEVCONV	801SH	LARGE SCHOOL BUS CONVENTIONAL
8084	1991	B20	CHEVROLET	CONVENTI	1991CHEVCONV	801SH	LARGE SCHOOL BUS CONVENTIONAL
8084N	2005	B20	IC	RE SB	2005ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8085	1997	B20	THOMAS	TRANSIT	1997THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8086	2000	B20	THOMAS	BUS	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT

EQ.NO.	YEAR	FUEL	MAKE	MODEL	EQ. TYPE	DEPT.	DEPT. DESCRIPTION
8087	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8088	1995	B20	THOMAS	TRANSIT	1995THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8089	1995	B20	THOMAS	TRANSIT	1995THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8090	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8091	1994	B20	THOMAS	TRANSIT	1994THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8093	2005	B20	IC	RE SB	2005ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8094	1995	B20	THOMAS	TRANSIT	1995THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8095	1995	B20	THOMAS	TRANSIT	1995THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8096	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8097	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8098	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8099	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8100	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8101	1996	B20	THOMAS	TRANSIT	1996THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8102	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8103	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8104	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8105	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8106	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8107	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8108	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8109	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8110	1998	B20	THOMAS	TRANSIT	1998THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8111	1998	B20	NAVISTAR	VISTA	1998NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8112	1998	B20	NAVISTAR	VISTA	1998NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8113	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8114	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8115	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8116	1999	B20	THOMAS	TRANSIT	1999THOMTRAN	801SH	LARGE SCHOOL BUS TRANSIT
8117	1999	B20	NAVISTAR	VISTA	1999NAVIVIST	801SH	SMALL SCHOOL BUS W/LIFT
8118	2000	B20	THOMAS	SAFTLINE	2000THOMSAFT	801SH	MED SCHOOL BUS W/LIFT

EQ.NO.	YEAR	FUEL	MAKE	MODEL	EQ. TYPE	DEPT.	DEPT. DESCRIPTION
8119	2000	B20	THOMAS	SAFTLINE	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8120	2000	B20	THOMAS	SAFTLINE	2000THOMSAFT	801SH	LARGE SCHOOL BUS TRANSIT
8121	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8122	2004	B20	IC	RE SB	2004ICRESB	801SH	LARGE SCHOOL BUS TRANSIT
8123	2004	B20	IC	RE SB	2004ICRESB	801SH	SMALL SCHOOL BUS W/LIFT
8124	2004	B20	IC	RE SB	2004ICRESB	801SH	SMALL SCHOOL BUS W/LIFT
8512	1998	B20	FORD	F800	1998FORDF800	810SH	BOX TRUCK
8513	1993	B20	FORD	F450	1993FORDF450	811SH	UTILITY W/CANOPY
8514	1991	B20	FORD	F450	1991FORDF450	816SH	UTILITY W/CANOPY
8521	2004	B20	FORD	F350	2004FORDF350	810SH	PICKUP 1 TON 4WD
8523	2004	B20	FORD	F350	2004FORDF350	810SH	PICKUP 1 TON 4WD
8524	2004	B20	FORD	F450	2004FORDF450	810SH	STAKE W/GATE
8687	1990	B20	ASPHALT	ASPHALT	1990ASPHASPH	813SH	UTILITY SM
8688	1990	B20	WELDING	WELDING	1990WELDWELD	813SH	UTILITY SM
8694	1995	B20	GMC	C6500	1995GMCREFR	825SH	REFER UNIT
8715	2003	B20	FORD	F350	2003FORDF350	810SH	PICKUP 1 TON 4WD
8723	1990	B20	SULLAIR	AIR COMP	1990COMPAIR	813SH	AIR COMP MED
8742	1989	B20	IHC	S-1954 C	1989IHCS1954	810SH	UTILITY W/CANOPY
8768	2003	B20	FREIGHTLINER	FC80	2003FREIFC80	889SE	REEFER UNIT
8778	1987	B20	IHC	S-1954	1987IHCS1954	810SH	MATERIAL SPREADER/PLOW
8814	1990	B20	BOB	753	1990BOB753	810SH	UNILOADER
8826	2001	B20	FORD	F360	2001FORDF360	818SH	UTILITY W/CANOPY
8950	2001	B20	NEW HOLLAND	LB75	2001NEWHLB75	813SH	BACKHOE

138 TOTAL UNITS

Appendix B – Arlington County Biodiesel Vehicle Fleet

EQUIPMENT LIST BY FUEL TYPE (BIODIESEL)

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
5017	1997	B20	CASE	590 SUPE	1997CASE590	018WS	BACKHOE
5020	1997	B20	FERGUSON	46A ROLL	1997FERG46A	012OP	ROLLER TOWED
5022	1997	B20	CASE	590 SUPE	1997CASE590	018WS	BACKHOE
5055	1996	B20	CASE	590 SUPE	1996CASE590S	018WS	BACKHOE
5066	1993	B20	CASE	1845C	1993CASE1845	012OP	UNILOADER
5094	1987	B20	IHC	S-1754	1987IHCS1754	018WS	UTILITY W/CANOPY
5101	1999	B20	NAVISTAR	2674 6X4	1999NAVI2674	012OP	DUMP LARGE
5104	1998	B20	DIAMOND CORP	TROLLEY	1998DIAMCORP	014PL	ART BUS
5105	1998	B20	DIAMOND CORP	TROLLEY	1998DIAMCORP	014PL	ART BUS
5115	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	012OP	DUMP MED
5123	1986	B20	INGERSOLL RAND	P175AWD	1986INGEP175	015TR	AIR COMP MED
5136	1998	B20	FORD	F800	1998FORDF800	012OP	DUMP MED
5147	1986	B20	INGERSOLL RAND	P175AWD	1986INGEP175	018WS	AIR COMP MED
5154	1986	B20	IHC	S-1900	1986IHC1900	018WS	UTILITY PWR-ALL
5157	1991	B20	CHEVROLET	P30	1991CHEVP30	018WS	VAN STEP LG
5160	1992	B20	IHC	4900	1992IHC4900	015TR	AERIAL BUCKET
5167	1998	B20	FORD	F800	1998FORDF800	012OP	DUMP MED
5169	1997	B20	CASE	590 SUPE	1997CASE590	018WS	BACKHOE
5189	1992	B20	IHC	4900	1992IHC4900	015TR	AERIAL BUCKET
5190	1998	B20	FORD	F800	1998FORDF800	012OP	DUMP MED
5193	1989	B20	INGERSOLL RAND	P175BWD	1989INGEP175	018WS	AIR COMP MED
5194	1989	B20	INGERSOLL RAND	P175BWD	1989INGEP175	018WS	AIR COMP MED
5202	1996	B20	FORD	LT9000	1996FORDLT90	018WS	DUMP LARGE
5226	2000	B20	FORD	E450	2000FORDE450	014PL	SMALL ART BUS

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
5227	2000	B20	FORD	E450	2000FORDE450	014PL	SMALL ART BUS
5230	1996	B20	FORD	LT9000	1996FORDLT90	012OP	DUMP LARGE
5249	1997	B20	FORD	F350	1997FORDF350	018WS	UTILITY
5251	1996	B20	FORD	LT9000	1996FORDLT90	012OP	DUMP LARGE
5259	1981	B20	INGERSOLL RAND	P175AWD	1981INGEP175	012OP	AIR COMP MED
5266	1996	B20	FORD	LT9000	1996FORDLT90	018WS	DUMP LARGE
5270	1998	B20	FORD	F800	1998FORDF800	012OP	DUMP MED
5307	1993	B20	FORD	F450	1993FORDF450	018WS	UTILITY W/CANOPY
5317	2003	B20	FORD	F350	2003FORDF350	015TR	UTILITY
5318	2003	B20	FORD	F350	2003FORDF350	015TR	UTILITY
5360	1999	B20	NEW HOLLAND	675-E	1999NEWH675E	012OP	BACKHOE
5415	1998	B20	FORD	F800	1998FORDF800	018WS	DUMP MED
5420	2003	B20	FORD	F350	2003FORDF350	012OP	PICKUP 1 TON 4WD
5424	2003	B20	STERLING	LT7500	2003STERLT75	018WS	VACUUM STORM BASIN
5425	2003	B20	STERLING	LT7500	2003STERLT75	018WS	VACUUM STORM BASIN
5429	2003	B20	FORD	F350	2003FORDF350	018WS	UTILITY
5430	2003	B20	FORD	F350	2003FORDF350	018WS	UTILITY CC WCRANE
5432	2003	B20	FORD	F350	2003FORDF350	018WS	PICKUP 1 TON EXT. CAB 4WD
5444	2003	B20	FORD	F350	2003FORDF350	012OP	PICKUP 1 TON 4WD
5452	1991	B20	IHC	4900	1991IHC4900	018WS	STAKE W/CRANE
5454	1996	B20	FORD	F800	1996FORDF800	012OP	DUMP MED
5460	2003	B20	FORD	F350	2003FORDF350	018WS	PICKUP 1 TON 4WD
5479	2001	B20	FERGUSON	46A	2001FERGU46A	012OP	ROLLER TOWED
5492	2003	B20	FORD	F350	2003FORDF350	012OP	PICKUP 1 TON 4WD
5495	2003	B20	FORD	F350	2003FORDF350	012OP	PICKUP 1 TON 4WD
5499	2003	B20	FORD	F350	2003FORDF350	018WS	PICKUP 1 TON 4WD
5509	2000	B20	JOHN DEERE	710D	2000JOHN710D	018WS	BACKHOE 4WD
5526	1996	B20	FORD	F800	1996FORDF800	012OP	DUMP MED
5531	1993	B20	FORD	F450	1993FORDF450	012OP	UTILITY W/CANOPY
5535	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	012OP	DUMP MED

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
5537	1996	B20	FORD	F800	1996FORDF800	012OP	DUMP MED
5540	1994	B20	IHC	4900	1994IHC4900	018WS	UTILITY PWR-ALL
5541	1994	B20	IHC	4900	1994IHC4900	018WS	UTILITY PWR-ALL
5548	1996	B20	FORD	F800	1996FORDF800	012OP	DUMP MED
5556	1996	B20	FORD	F800	1996FORDF800	012OP	DUMP MED
5560	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	018WS	DUMP MED
5567	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	012OP	DUMP MED
5570	2000	B20	VOLVO	WG64	2000VOLVWG64	018WS	DUMP LARGE
5571	2000	B20	VOLVO	WG64	2000VOLVWG64	012OP	DUMP LARGE
5583	2000	B20	GMC	C3500	2000GMCC350	012OP	UTILITY W/CANOPY
5584	2000	B20	GMC	C3500	2000GMCC350	012OP	UTILITY W/CANOPY
5594	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	018WS	DUMP MED
5597	1993	B20	FORD	F450	1993FORDF450	018WS	STAKE W/GATE
5599	2000	B20	STERLING	LT9500	2000STERLT95	012OP	CONCRETE MIXER
5614	1999	B20	NAVISTAR	2654 6X4	1999INTE2654	018WS	DUMP LARGE
5618	2003	B20	FORD	F350	2003FORDF350	018WS	PICKUP 1 TON 4WD
5623	2004	B20	FORD	F350	2004FORDF350	018WS	UTILITY 1 TON 4WD
5625	2003	B20	FORD	F350	2003FORDF350	018WS	PICKUP 1 TON 4WD
5627	2004	B20	JOHN DEERE	710G	2004JOHN710G	018WS	BACKHOE 4WD
5649	1990	B20	WHITE GMC	ACL84D	1990WHITACL8	018WS	STAKE W/CRANE
5650	2002	B20	FREIGHTLINER	FL-70	2002FREIFL70	018WS	DUMP MED
5654	1990	B20	IHC	4900	1990IHC4900	012OP	DUMP MED
5655	1990	B20	IHC	4900	1990IHC4900	018WS	UTILITY W/CANOPY
5672	1999	B20	STERLING	L7501	1999STERL750	018WS	SEWER FLUSHER
5677	1990	B20	IHC	4900	1990IHC4900	018WS	STAKE MED
5680	1999	B20	STERLING	L7501	1999STERL750	018WS	SEWER FLUSHER
5684	1999	B20	NAVISTAR	2654 6X4	1999INTE2654	012OP	DUMP LARGE
5687	2002	B20	FREIGHTLINER	FL-70	2002FREIFL70	018WS	DUMP MED
5691	2002	B20	FREIGHTLINER	FL-70	2002FREIFL70	018WS	DUMP MED
5696	2000	B20	VOLVO	WG64	2000VOLVWG64	012OP	DUMP LARGE
5700	1993	B20	FORD	F450	1993FORDF450	012OP	DUMP SMALL

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
5710	1984	B20	IHC	S-1724	1984IHC1724	018WS	UTILITY PWR-ALL
5730	2000	B20	VOLVO	WG64	2000VOLVWG64	012OP	DUMP LARGE
5743	1995	B20	IHC	4900	1995IHC4900	012OP	DUMP MED
5752	1999	B20	NEW HOLLAND	675-E	1999NEWH675E	012OP	BACKHOE
5762	1999	B20	NEW HOLLAND	675-E	1999NEWH675E	012OP	BACKHOE
5784	1993	B20	FORD	F450	1993FORDF450	012OP	UTILITY W/CANOPY
5791	2000	B20	GMC	C3500	2000GMCC350	018WS	UTILITY W/CANOPY
5808	1996	B20	FORD	LT9000	1996FORDLT90	012OP	DUMP LARGE
5850	1985	B20	INGERSOLL RAND	P175AWD	1985INGEP175	018WS	AIR COMP MED
5907	1999	B20	NAVISTAR	2654 6X4	1999INTE2654	018WS	DUMP LARGE
5947	1999	B20	NEW HOLLAND	675-E	1999NEWH675E	012OP	BACKHOE
3026	1986	B20	IHC	CO-1950-	1986IHC1950	023RE	LEAF COLLECTOR
3033	1989	B20	WHITE GMC	ACL64B	1989WHITACL6	023RE	ROLL ON OFF
3034	1986	B20	IHC	CO-1950-	1986IHC1950	023RE	LEAF COLLECTOR
3039	1997	B20	FORD	F350	1997FORDF350	025WP	STAKE W/CRANE
3092	2001	B20	STERLING	SC8000	2001STERSC8000	022SW	SWEEPER VAC
3093	2001	B20	STERLING	SC8000	2001STERSC8000	022SW	SWEEPER VAC
3103	1980	B20	FORD	LT8000	1980FORDLT80	025WP	ROLL ON OFF
3121	2003	B20	FORD	F450	2003FORDF450	026UO	REFUSE SM
3122	2002	B20	STERLING	SC8000	2002STERSC8000	022SW	SWEEPER RE-GEN. AIR
3126	2003	B20	FREIGHTLINER	FC80	2003FREIFC80	023RE	LEAF COLLECTOR
3127	2003	B20	FREIGHTLINER	FC80	2003FREIFC80	023RE	LEAF COLLECTOR
3128	2003	B20	FREIGHTLINER	FC80	2003FREIFC80	023RE	LEAF COLLECTOR
3129	2003	B20	FREIGHTLINER	FC80	2003FREIFC80	023RE	LEAF COLLECTOR
3130	2004	B20	INTERNATIONAL	4200 SBA	2004INTE4200	022SW	REFUSE MED SIDE LOADER
3138	2000	B20	CCC	LET40-C	2000CCLET40-C	022SW	REFUSE REAR
3139	1999	B20	NAVISTAR	2674 6X4	1999NAVI2674	023RE	ROAD TRACTOR
3143	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	023RE	REFUSE W/CRANE
3168	2000	B20	NAVISTAR	2654 6X4	2000NAVI2654	023RE	ROLL ON OFF
3186	1994	B20	CASE	1845C	1994CASE1845	023RE	UNILOADER

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
3201	2004	B20	CCC	LET2-46C	2004CCCLET2	022SW	REFUSE REAR
3202	2004	B20	CCC	LET2-46C	2004CCCLET2	022SW	REFUSE REAR
3204	2004	B20	CCC	LET2-46C	2004CCCLET2	022SW	REFUSE REAR
3238	2000	B20	CCC	LDT40-C	2000CCCLDT4	022SW	REFUSE SIDE
3329	2002	B20	CATERPILLAR	950G	2002CATE950G	023RE	LOADER LG
3340	2000	B20	FREIGHTLINER	FC-80	2000FREIFC80	023RE	LEAF COLLECTOR
3378	1990	B20	IHC	4900	1990IHC4900	023RE	UTILITY
3419	1998	B20	FORD	F800	1998FORDF800	023RE	DUMP MED
3430	1999	B20	FORD	F550	1999FORDF550	023RE	DUMP SMALL
3446	1994	B20	IHC	4900 4X2	1994IHC4900	023RE	LEAF COLLECTOR
3460	1994	B20	IHC	4900 4X2	1994IHC4900	023RE	LEAF COLLECTOR
3497C	1994	B20	IHC	4900	1994IHC4900	026UO	SWEEPER VAC
3520	2001	B20	STERLING	SC8000	2001STERSC8000	022SW	SWEEPER VAC
3579	2000	B20	GMC	C3500	2000GMCC350	025WP	DUMP SMALL
3582	2000	B20	GMC	C3500	2000GMCC350	025WP	UTILITY W/CANOPY
3610	2003	B20	FORD	F350	2003FORDF350	025WP	STAKE W/WELDER
3621	2003	B20	FORD	F350	2003FORDF350	025WP	STAKE W/CRANE
3632	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	023RE	REFUSE W/CRANE
3645	1993	B20	WHITE GMC	WG64	1993WHITWG64	025WP	VACUUM STORM BASIN
3656	2000	B20	FREIGHTLINER	FC-80	2000FREIFC80	023RE	LEAF COLLECTOR
3679	2000	B20	FREIGHTLINER	FC-80	2000FREIFC80	023RE	LEAF COLLECTOR
3690	1989	B20	WHITE GMC	STREET F	1989WHITSTRE	022SW	STREET FLUSHER
3757	1990	B20	IHC	4900 4X2	1990IHC4900	023RE	LEAF COLLECTOR
3763	1993	B20	IHC	4900 4X2	1993IHC4900	023RE	LEAF COLLECTOR
3764	1993	B20	IHC	4900 4X2	1993IHC4900	023RE	LEAF COLLECTOR
3767	1990	B20	IHC	4900 4X2	1990IHC4900	023RE	LEAF COLLECTOR
3804	2002	B20	CATERPILLAR	950G	2002CATE950G	023RE	LOADER LG
3877	1995	B20	CASE	621B	1995CASE621B	023RE	LOADER MED
3971	2000	B20	FREIGHTLINER	FC-80	2000FREIFC80	023RE	LEAF COLLECTOR
3991	1999	B20	NAVISTAR	2674 6X4	1999IHC2674	023RE	ROAD TRACTOR
1105	2004	B20	FORD	F350	2004FORDF350	052PM	PICKUP 1 TON 4WD

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
2050	2000	B20	E-ONE	CYCLONE	2000EMERGONE	064FO	PUMPER
2134	1985	B20	FORD	F700	1985FORDF700	064FO	METRO RESCUE
2149	2002	B20	FREIGHTLINER	FL60	2001MEDIC	064FO	MED MEDIC
2156	1989	B20	SIMON-DUPLEX	L172	1989SIMOL172	064FO	AERIAL LADDER
2174	2001	B20	AMER LAFRANCE	EAGLE	2001AMEREAGL	064FO	HEAVY RESCUE
2201	2002	B20	FREIGHTLINER	MT 55	2002FREIMT55	064FO	BOMB SQUAD
2210	2003	B20	FREIGHTLINER	FL80	2003FREIFL80	064FO	FIRE TRACTOR TRAILER UNIT- HAZMAT
2211	2003	B20	FREIGHTLINER	FL80	2003FREIFL80	064FO	FIRE TRACTOR TRAILER UNIT - TECH RESCUE
2353	1988	B20	FORD	F600	1988FORDF600	064FO	BOX TRUCK
2409	1996	B20	DUPLEX	D8400	1996DUPLD840	064FO	HEAVY RESCUE
2501	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2502	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2503	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2505	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2507	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2508	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2510	2002	B20	E-ONE	CYCLONE	2002EMERCYC	064FO	PUMPER
2515	2001	B20	E-ONE	CYCLONE	2001EMERCYCL	064FO	AERIAL PLATFORM
2528	1997	B20	FREIGHTLINER	FL60	1997FREIFL60	064FO	MED MEDIC
2591	1997	B20	FREIGHTLINER	FL60	1997FREIFL60	064FO	MED MEDIC
2623	2000	B20	E-ONE	CYCLONE	2000EMERGONE	064FO	PUMPER
2626	2003	B20	FREIGHTLINER	FL60	2003FREIFL60	064FO	MEDIUM MEDIC
2627	2001	B20	FREIGHTLINER	FL60	2001FREIFL60	064FO	MED MEDIC
2628	2001	B20	FREIGHTLINER	FL60	2001FREIFL60	064FO	MED MEDIC
2629	2001	B20	FREIGHTLINER	FL60	2001FREIFL60	064FO	MED MEDIC
2647	2000	B20	FREIGHTLINER	FL60	2000FREIFL60	064FO	MED MEDIC
2843	1998	B20	E-ONE	QUINT HP	1998EONEQUIN	064FO	PUMPER/LADDER
2863	1998	B20	E-ONE	QUINT HP	1998EONEQUIN	064FO	PUMPER/LADDER
2891	1999	B20	FREIGHTLINER	FL60	1999FREIFL60	064FO	MED MEDIC

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
2903	1993	B20	FORD	F350	1993FORDF350	064FO	MEDIC ALS
2904	1996	B20	DUPLEX	HAZMAT	1996DUPLHAZM	064FO	HEAVY RESCUE
2984	1999	B20	E-ONE	CYCLONE	1999EMERCYCL	064FO	PUMPER
2985	1999	B20	E-ONE	CYCLONE	1999EMERCYCL	064FO	PUMPER
7402	1996	B20	THOMAS	BUS	1996THOMBUS	064FO	BUS
6008	1987	B20	THOMAS	M87	1987THOMCOMM	072PP	COMMAND POST
4007	1997	B20	VERMEER	123OT	1997VERM123O	082PA	CHIPPER
4018	2002	B20	THOMAS	TRANSITL	2002THOM1405N	087RE	BUS
4028	1995	B20	GMC	C3500HD	1995GMC3500	082PA	REFUSE SM
4029	1988	B20	CASE	W20C	1988CASEW20C	082PA	LOADER MED
4031	2003	B20	FERGUSON	46A ROLL	2003FERG46A	082PA	ROLLER TOWED
4033	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON CREWCAB
4035	2003	B20	FORD	F350	2003FORDF350	082PA	DUMP SMALL
4036	2003	B20	FREIGHTLINER	FC80	2003FREIFC80	082PA	REFUSE MED
4037	2003	B20	JOHN DEERE	410G	2003JOHN410G	082PA	BACKHOE
4040	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON CREWCAB
4044	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON 4WD
4045	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON CREWCAB
4056	2001	B20	FORD	F350	2001FORDF350	082PA	DUMP SM 4WD
4070	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	086RE	STAKE DUMP
4093	1997	B20	VERMEER	123OT	1997VERM123O	082PA	CHIPPER
4102	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON CREWCAB
4103	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON CREWCAB
4104	2003	B20	FORD	F350	2003FORDF350	082PA	PICKUP 1 TON CREWCAB
4109	2004	B20	IC	RE COMM.	2004ICRECO	087RE	BUS
4168	2002	B20	FREIGHTLINER	FL-70	2002FREIFL70	082PA	REFUSE MED
4321	2001	B20	FREIGHTLINER	FL-70	2001FREIFL70	082PA	REFUSE MED
4322	2001	B20	FREIGHTLINER	FL-70	2001FREIFL70	082PA	AERIAL BUCKET
4334	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	082PA	STAKE MED
4335	2001	B20	FREIGHTLINER	FL-70	2001FREIFL70	082PA	AERIAL BUCKET
4418	1998	B20	FORD	F800	1998FORDF800	082PA	STAKE W/CRANE

EQ.NO.	YEAR	FUEL	MANUFACTURER	MODEL	EQ. TYPE	DEPARTMENT	DEPT. DESCRIPTION
4437	1998	B20	FORD	F800	1998FORDF800	082PA	STAKE MED
4443	2001	B20	FORD	F350	2001FORDF350	082PA	STAKE W/WELDER
4445	2001	B20	FORD	F366	2001FORDF366	082PA	DUMP SMALL
4465	1998	B20	FORD	F800	1998FORDF800	082PA	STAKE DUMP
4470	1988	B20	IHC	S-1954	1988IHCS1954	082PA	STAKE MED
4486	1998	B20	FORD	F800	1998FORDF800	082PA	STAKE MED
4514	2000	B20	GMC	C3500	2000GMCC350	082PA	UTILITY W/CANOPY
4564	1996	B20	FORD	LT9000	1996FORDLT90	082PA	DUMP LARGE
4574	2000	B20	GMC	C3500	2000GMCC350	084AP	DUMP SMALL
4579	2005	B20	FORD	F350	2005FORDF350	082PA	DUMP SMALL
4598	2000	B20	GMC	C3500	2000GMCC350	084AP	DUMP SMALL CREWCAB
4602	2000	B20	GMC	C3500	2000GMCC350	082PA	DUMP SMALL CREWCAB
4617	1997	B20	FORD	F450	1997FORDF450	082PA	DUMP SMALL
4692	1991	B20	IHC	4900	1991IHC4900	082PA	LEAF COLLECTOR
4754	2000	B20	STERLING	CF8000	2000STERCF80	082PA	SWEEPER VAC
4785	1986	B20	INGERSOLL RAND	P175AWD	1986INGEP175	082PA	AIR COMP MED
4849	1999	B20	NEW HOLLAND	LX-665	1999NEWHUNIL	082PA	UNILOADER
4871	2000	B20	FREIGHTLINER	FL-70	2000FREIFL70	086RE	STAKE DUMP
1012	2002	B20	FREIGHTLINER	FL60	2002FREIFL60	143HE	ROLL BACK
1023	2003	B20	KENWORTH	T800B	2003KENWT800	143HE	WRECKER LG
1038	1988	B20	FORD	F450	1988FORDF450	142LE	WRECKER
1139	2001	B20	FREIGHTLINER	FL-70	2001FREIFL70	143HE	ROLL BACK

227 TOTAL NUMBER OF UNITS

Appendix C – Biodiesel Suppliers

The following list is available through the National Biodiesel Board's web site (<http://biodiesel.org>). Note, the location of a potential supplier's headquarters may have no bearing on its ability to supply biodiesel locally.

<p>Griffin Industries; Cold Spring, KY Phone: (800) 743-7413 Contact: Hart Moore jhmoore@griffinind.com http://www.griffinind.com</p>	<p>World Energy Alternatives; Nevada City, CA Phone: (530) 478-9196 Contact: Graham Noyes http://www.worldenergy.net</p>
<p>Biotane Fuels Imperial Western Products; Coachella, CA Contact: Tom Prokop Bob Clark bclark@imperialwesternproducts.com http://www.biotanefuels.com</p>	<p>Archer Daniels Midland; Decatur, IL Phone: (217) 451-6348 Contact: Peter Reimers http://www.admworld.com e-mail: peter_reimers@admworld.com</p>
<p>Soy Solutions, Ruthven, IA Phone: (712) 338-2223 Contact: Lon Peterson soysolutions@iowaone.net http://www.farmerscoopelev.com</p>	<p>Gulf Hydrocarbon; Houston, Texas Phone: (713) 305-3133 FAX: (713) 666-0190 Contact: Jess Hewitt email: jhewitt@buybiodiesel.com http://www.buybiodiesel.com</p>
<p>Renewable Alternatives; Green Bay, WI Phone: (920) 217-3548 Contact: Kelly Maloney kmaloney@new.rr.com</p>	<p>Grain Growers Cooperative; Rocky Mount, NC Phone: (252) 446-7100 Contact: Sam Lee Jr. graingrowers@earthlink.net</p>
<p>Virginia Biodiesel Refinery; Kilmarnock, VA Phone: (804) 435-1126 Contact: Doug Faulkner dfaulkner@rivnet.net</p>	<p>US Biofuels Inc; Rome, GA Phone: (706) 291-4829 Contact: Greg Hopkins usbiofuels@bellsouth.net</p>
<p>Biodiesel of Las Vegas, Inc., Las Vegas, NV Phone: (805) 542-0836 Contact: Ben Kulick biodiesel@3cventures.com</p>	<p>Bio-energy Systems; Vallejo, CA Phone: (707) 649-9100 Contact: Jacques Sinoncelli j.sinoncelli@bob@enviroalt.com bio-energy.com</p>

Environmental Alternatives; Brooklyn, NY Phone: (718) 972-2156 Contact: Bob Lindenbaum bob@enviroalt.com	Missouri Better Bean; Bunceton, MO Phone: (660) 427-5444 Contact: Steve Nappier dooser@iland.net
Biomass Energy Service; Tifton, GA Phone: (229) 386-9942 Contact: Randy Parker rpparker@friendlycity.net	

Appendix D – Arlington Biodiesel Cost

FUEL PRICE per GALLON FY 2005 (Through November 15th 2004)

Weekly Dates Monday Prices	Diesel Fuel	Biodiesel B-20
2-Aug-2004	\$1.749	\$1.561
9-Aug-2004	\$1.749	\$1.558
16-Aug-2004	\$1.749	\$1.675
23-Aug-2004	\$1.749	\$1.675
30-Aug-2004	\$1.749	\$1.626
6-Sep-2004	\$1.829	\$1.673
13-Sep-2004	\$1.799	\$1.730
20-Sep-2004	\$1.799	\$1.829
27-Sep-2004	\$1.959	\$1.837
4-Oct-2004	\$1.999	\$1.867
11-Oct-2004	\$1.999	\$1.806
18-Oct-2004	\$2.189	\$1.867
25-Oct-2004	\$2.189	\$1.898
1-Nov-2004	\$2.189	\$1.840
8-Nov-2004	\$2.189	\$1.763
15-Nov-2004	\$2.189	\$1.753
Average Price per gal	\$ 1.94	\$ 1.75

Note: The price quoted for Diesel Fuel is taken weekly by Arlington personnel as noted at a local diesel retailer.

FUEL PRICE per GALLON FY 2004

Monday Price Weekly Dates	Biodiesel B-20
1-Jul-2003	\$1.236
7-Jul-2003	\$1.254
14-Jul-2003	\$1.238
21-Jul-2003	\$1.220
28-Jul-2003	\$1.220
4-Aug-2003	\$1.250
11-Aug-2003	\$1.244
18-Aug-2003	\$1.250
25-Aug-2003	\$1.241
1-Sep-2003	\$1.240
8-Sep-2003	\$1.209
15-Sep-2003	\$1.209
22-Sep-2003	\$1.187
29-Sep-2003	\$1.187
6-Oct-2003	\$1.258
13-Oct-2003	\$1.300
20-Oct-2003	\$1.234
27-Oct-2003	\$1.213

Monday Price	Biodiesel
3-Nov-2003	\$1.234
10-Nov-2003	\$1.252
17-Nov-2003	\$1.284
24-Nov-2003	\$1.251
1-Dec-2003	\$1.273
8-Dec-2003	\$1.280
15-Dec-2003	\$1.314
22-Dec-2003	\$1.293
29-Dec-2003	\$1.293
5-Jan-2004	\$1.356
12-Jan-2004	\$1.365
19-Jan-2004	\$1.426
26-Jan-2004	\$1.380
2-Feb-2004	\$1.353
9-Feb-2004	\$1.353
16-Feb-2004	\$1.427
23-Feb-2004	\$1.443
1-Mar-2004	\$1.404
8-Mar-2004	\$1.378
15-Mar-2004	\$1.448
22-Mar-2004	\$1.413
29-Mar-2004	\$1.397
5-Apr-2004	\$1.401
12-Apr-2004	\$1.428
19-Apr-2004	\$1.383
26-Apr-2004	\$1.396
3-May-2004	\$1.466
10-May-2004	\$1.486
17-May-2004	\$1.486
24-May-2004	\$1.455
31-May-2004	\$1.444
7-Jun-2004	\$1.413
14-Jun-2004	\$1.414
21-Jun-2004	\$1.428
28-Jun-2004	\$1.439
Annual Average Price per gal	\$1.33

Appendix E – Arlington Biodiesel Personnel

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