



Staff Report

City of Manhattan Beach

TO: Honorable Mayor Montgomery and Members of the City Council

THROUGH: Geoff Dolan, City Manager

FROM: Bruce Moe, Finance Director
Jim Arndt, Public Works Director

DATE: May 20, 2008

SUBJECT: Consideration of the Use of Five Percent Bio Diesel for City Fleet Operations
(Council Work Plan Green Initiative)

RECOMMENDATION:

Staff recommends that the City Council adopt a policy of utilizing five percent bio diesel for City fleet operations.

FISCAL IMPLICATION:

Five percent bio diesel carries a \$.03 to \$.05 premium per gallon over the standard diesel fuel we are currently purchasing. We consume approximately 15,000 gallons of diesel fuel per year. As a result, the use of 5% bio diesel fuel will add approximately \$450 to \$750 per year to our fuel costs. Additional costs for fuel filters may add \$1,000 to \$2,000 (discussed below). This differential can be absorbed in the proposed FY 2008-2009 budget.

BACKGROUND:

The City operates several vehicles and pieces of equipment that utilize diesel fuel. This includes fire trucks, medium-duty trucks, ambulances and emergency generators to name a few. The current diesel fuel we purchase is a reduced sulfur content motor fuel. The 5% bio diesel we are proposing to purchase is a blend of diesel fuel and 5% biodegradable vegetable oils or animal fats.

DISCUSSION:

One of the elements discussed in the November 2007 Green Team report was the use of bio diesel in our diesel powered vehicles and equipment. This is a low cost option that can aid in the reduction of air pollution. The fuel is currently available from our regular suppliers. No modifications are required to use the fuel in our existing fleet. However, because of the solvent effect of the bio diesel, deposits in fuel storage tanks may be released initially. This will require a filter change in most vehicles sooner than normal, until the accumulated deposits have been eliminated. After that, routine maintenance schedules will apply. Additionally, minor filtration devices may be required on our underground storage tanks in order to implement this fuel.

Agenda Item #: _____

Bio diesel is available in a number of mixtures ranging from 5% to 100%. Staff is recommending the 5% blend because this is the maximum percentage permitted by the vehicle manufacturers while still maintaining the original warranty.

Attachments: A. Bio diesel FAQ's



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What is Biodiesel?

Biodiesel is the name of a clean burning alternative fuel, produced from domestic, renewable resources. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. It can be used in compression-ignition (diesel) engines with little or no modifications. Biodiesel is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics.

Is Biodiesel the same thing as raw vegetable oil?

No! Biodiesel is produced from any fat or oil such as soybean oil, through a refinery process called [transesterification](#). This process is a reaction of the oil with an alcohol to remove the glycerin, which is a by-product of biodiesel production. Fuel-grade biodiesel must be produced to strict industry specifications (ASTM D6751) in order to insure proper performance. Biodiesel is the only alternative fuel to have fully completed the health effects testing requirements of the 1990 Clean Air Act Amendments. Biodiesel that meets ASTM D6751 and is legally registered with the Environmental Protection Agency is a legal motor fuel for sale and distribution. Raw vegetable oil cannot meet biodiesel fuel specifications, it is not registered with the EPA, and it is not a legal motor fuel.

For entities seeking to adopt a definition of biodiesel for purposes such as federal or state statute, state or national divisions of weights and measures, or for any other purpose, the official definition consistent with other federal and state laws and Original Equipment Manufacturer (OEM) guidelines is as follows:

Biodiesel is defined as mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which conform to ASTM D6751 specifications for use in diesel engines. Biodiesel refers to the pure fuel before blending with diesel fuel. Biodiesel blends are denoted as, "BXX" with "XX" representing the percentage of biodiesel contained in the blend (ie: B20 is 20% biodiesel, 80% petroleum diesel).

Is biodiesel used as a pure fuel or is it blended with petroleum diesel?

Biodiesel can be used as a pure fuel or blended with petroleum in any percentage. B20 (a blend of 20 percent by volume biodiesel with 80 percent by volume petroleum diesel) has demonstrated significant environmental benefits with a minimum increase in cost for fleet operations and other consumers.

Is it approved for use in the US?

Biodiesel is registered as a fuel and fuel additive with the Environmental Protection Agency (EPA) and meets clean diesel standards established by the California Air Resources Board (CARB). Neat (100 percent) biodiesel has been designated as an alternative fuel by the Department of Energy (DOE) and the US Department of Transportation (DOT).

How much biodiesel has been sold in the US?

The National Biodiesel Board has released the following sales volume estimates for the US:

2006 -- 250 million gallons
 2005 -- 75 million gallons
 2004 -- 25 million gallons
 2003 -- 20 million gallons
 2002 -- 15 million gallons
 2001 -- 5 million gallons
 2000 -- 2 million gallons
 1999 -- 500,000 gallons

How do biodiesel emissions compare to petroleum diesel?

Biodiesel is the only alternative fuel to have fully completed the health effects testing requirements of the Clean Air Act. The use of biodiesel in a conventional diesel engine results in substantial reduction of unburned hydrocarbons, carbon monoxide, and particulate matter compared to emissions from diesel fuel. In addition, the exhaust emissions of sulfur oxides and sulfates (major components of acid rain) from biodiesel are essentially eliminated compared to diesel.

Of the major exhaust pollutants, both unburned hydrocarbons and nitrogen oxides are ozone or smog forming precursors. The use of biodiesel results in a substantial reduction of unburned hydrocarbons. Emissions of nitrogen oxides are either slightly reduced or slightly increased depending on the duty cycle of the engine and testing methods used. Based on engine testing, using the most stringent emissions testing protocols required by EPA for certification of fuels or fuel additives in the US, the overall ozone forming potential of the speciated hydrocarbon emissions from biodiesel was nearly 50 percent less than that measured for diesel fuel.

Can biodiesel help mitigate “global warming”?

A 1998 biodiesel lifecycle study, jointly sponsored by the US Department of Energy and the US Department of Agriculture, concluded biodiesel reduces net CO² emissions by 78 percent compared to petroleum diesel. This is due to biodiesel's closed carbon cycle. The CO² released into the atmosphere when biodiesel is burned is recycled by growing plants, which are later processed into fuel. Is biodiesel safer than petroleum diesel? Scientific research confirms that biodiesel exhaust has a less harmful impact on human health than petroleum diesel fuel. Biodiesel emissions have decreased levels of polycyclic aromatic hydrocarbons (PAH) and nitrited PAH compounds that have been identified as potential cancer causing compounds. Test results indicate PAH compounds were reduced by 75 to 85 percent, with the exception of benzo(a)anthracene, which was reduced by roughly 50 percent. Targeted nPAH compounds were also reduced dramatically with biodiesel fuel, with 2-nitrofluorene and 1-nitropyrene reduced by 90 percent, and the rest of the nPAH compounds reduced to only trace levels.

Does biodiesel cost more than other alternative fuels?

When reviewing the high costs associated with other alternative fuel systems, many fleet managers have determined biodiesel is their least-cost-strategy to comply with state and federal regulations. Use of biodiesel does not require major engine modifications. That means operators keep their fleets, their spare parts inventories, their refueling stations and their skilled mechanics. The only thing that changes is air quality.

Do I need special storage facilities?

In general, the standard storage and handling procedures used for petroleum diesel can be used for biodiesel. The fuel should be stored in a clean, dry, dark environment. Acceptable storage tank materials include aluminum, steel, fluorinated polyethylene, fluorinated polypropylene and teflon. Copper, brass, lead, tin, and zinc should be avoided.

Can I use biodiesel in my existing diesel engine?

Biodiesel can be operated in any diesel engine with little or no modification to the engine or the fuel system. Biodiesel has a solvent effect that may release deposits accumulated on tank walls and pipes from previous diesel fuel storage. The release of deposits may clog filters initially and precautions should be taken. Ensure that only fuel meeting the biodiesel specification is used.

Where can I purchase biodiesel?

Biodiesel can be made available anywhere in the US. The National Biodiesel Board (NBB) maintains a list of registered fuel marketers. A current list is available on the biodiesel web site at www.biodiesel.org or by calling the NBB at (800) 841-5849.

Who can answer my questions about biodiesel?

The NBB maintains the largest library of biodiesel information in the US. Information can be requested by visiting the biodiesel web site at www.biodiesel.org, by emailing the NBB at info@nbb.org, or by calling NBB's toll free number (800) 841-5849.

For more information on the general and technical definitions of biodiesel, the distinction between the two and why those distinctions are important, [click here](#).

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3337a Emerald Lane • PO Box 104898
Jefferson City, MO 65110-4898
(800) 841-5849 • fx: (573) 635-7913
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