



**ATTACHMENT B, Revision 1  
Biodiesel Fuel Specification  
For**

**Campbell Industrial Park Generating Station (CIP CT-1)**

| <b>Property</b>                               | <b>Test Method</b> | <b>Units</b>       | <b>Min Value</b> | <b>Max Value</b> |
|---|--------------------|--------------------|------------------|------------------|
| Calcium and Magnesium, combined               | EN 14538           | ppm (µg/g)         |                  | 5                |
| Flash point (closed cup)                      | D93                | ° C                | 93               |                  |
| Alcohol Control, one of following must be met |                    |                    |                  |                  |
| 1. Methanol content                           | EN 14110           | % volume           |                  | 0.2              |
| 2. Flash point                                | D93                | ° C                | 130              |                  |
| Water and sediment                            | D2709              | % volume           |                  | 0.05             |
| Kinematic viscosity, 40° C                    | D445               | mm <sup>2</sup> /s | 1.9              | 6                |
| Sulfated ash                                  | D874               | % mass             |                  | 0.02             |
| Ash   | D482               | wt %               |                  | 0.01             |
| Sulfur  | D5453              | % mass (ppm)       |                  | 0.05 (500)       |
| Copper strip corrosion                        | D130               |                    |                  | No. 3            |
| Cetane number                                 | D613               |                    | 47               |                  |
| Cloud point ( <i>Report</i> )                 | D2500              | ° C                |                  |                  |
| Carbon residue                                | D4530              | %mass              |                  | 0.05             |
| Acid number                                   | D664               | mg KOH/g           |                  | 0.30             |
| Free glycerin                                 | D6584              | % mass             |                  | 0.020            |
| Total glycerin                                | D6584              | % mass             |                  | 0.240            |
| Distillation temperature                      |                    |                    |                  |                  |
| Atmospheric equivalent temperature            |                    |                    |                  |                  |
| 90% recovered                                 | D1160              | ° C                |                  | 360              |
| Oxidation stability                           | D7462              | mg per 100 cc      |                  | 2.5              |
| Sodium and Potassium, combined                | D3605 / D6728      | ppmw               |                  | 0.5              |
| Vanadium (V)                                  | D3605 / D6728      | ppmw               |                  | 0.5              |
| Lead (Pb)                                     | D3605 / D6728      | ppmw               |                  | 0.5              |
| Barium (Ba)                                   | D3605 / D6728      | ppmw               |                  | 2.0              |
| Manganese (Mn)                                | D3605 / D6728      | ppmw               |                  | 2.0              |
| Phosphorous (P)                               | D3605 / D6728      | ppmw               |                  | 2.0              |
| Chlorides (Cl)                                | D4929M             | ppmw               |                  | 6.0              |
| Cold Soak Filtration                          | Annex to D6751     | seconds            |                  | 360              |
| Heat of Combustion                            | ASTM D240          | Btu/lb             |                  | report value     |



**ATTACHMENT B, Revision 1**  
**Biodiesel Fuel Specification**  
**For**

**Honolulu International Airport Emergency Power Facility (HIA EPF)**

| <b>Property</b>                    | <b>Test Method</b> | <b>Units</b>       | <b>Min Value</b>                      | <b>Max Value</b> |
|------------------------------------|--------------------|--------------------|---------------------------------------|------------------|
| Density at 15°C                    | D1298              | g/cm <sup>3</sup>  | 0.86                                  | 0.90             |
| Pour Point                         | D97                | ° C                | 6° C (10° F)<br>below<br>ambient temp |                  |
| Calcium and Magnesium, combined    | EN 14538           | ppm (µg/g)         |                                       | 5                |
| Flash point (closed cup)           | D93                | ° C                | 93                                    |                  |
| Methanol content                   | EN 14110           | % volume           |                                       | 0.2              |
| Water and sediment                 | D2709              | % volume           |                                       | 0.05             |
| Kinematic viscosity, 40° C         | D445               | mm <sup>2</sup> /s | 1.9                                   | 6                |
| Sulfated ash                       | D874               | % mass             |                                       | 0.02             |
| Sulfur                             | D5453              | % mass<br>(ppm)    |                                       | 0.0015 (15)      |
| Copper corrosion                   | D130               |                    |                                       | No. 1            |
| Cetane number                      | D613               |                    | 45                                    |                  |
| Cloud point ( <i>Report</i> )      | D2500              | ° C                |                                       |                  |
| Carbon residue                     | D4530              | %mass              |                                       | 0.05             |
| Acid value                         | D664               | mg KOH/g           |                                       | 0.30             |
| Free glycerin                      | D6584              | % mass             |                                       | 0.020            |
| Total glycerin                     | D6584              | % mass             |                                       | 0.240            |
| Phosphorus content                 | D4951              | % mass             |                                       | 0.001            |
| Distillation temperature           |                    |                    |                                       |                  |
| Atmospheric equivalent temperature |                    |                    |                                       |                  |
| 90% recovered                      | D1160              | ° C                |                                       | 360              |
| Oxidation stability                | EN14112            | hours              | 3                                     |                  |
| Sodium and Potassium, combined     | EN14538            | ppm                |                                       | 5                |
| Esterification                     | EN14103            | % mass             | 97.5                                  |                  |
| Monoglycerides                     | D6584              | % mass             |                                       | 0.8              |
| Diglycerides                       | D6584              | % mass             |                                       | 0.2              |
| Triglycerides                      | D6584              | % mass             |                                       | 0.2              |
| Cold Soak Filtration               | Annex to D6751     | seconds            |                                       | 360              |