BQ-9000 Quality Management System

Marketer Requirements

Revision 5
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This requirements document has been prepared by the National Biodiesel Accreditation Commission, an autonomous committee of the National Biodiesel Board, P.O. Box 104898, Jefferson City, MO 65110-4898, for use in a cooperative and voluntary program for the certification of marketers of biodiesel. Compliance with these requirements is a minimum requirement of the certification process. The existence of this document does not in any respect preclude any entity from producing, purchasing, or using products, processes, or procedures not conforming to this standard. This document is subject to periodic review and revision control and users are cautioned to obtain the latest edition.

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1 SCOPE

This document specifies requirements for a quality management system where an organization needs to

a) demonstrate its ability to receive product that meets ASTM D6751

b) blend biodiesel and distribute it

c) address quality assurance through the effective application of the program, including processes for corrective action and the prevention of nonconformity.

The requirements specified herein are applicable to fuel marketers in the biodiesel industry. The process control requirements are prescriptive, while the remaining clauses are descriptive.

2 TERMS AND DEFINITIONS

For use in this text, the following terms and definitions apply.

Note: The word **"shall"** indicates mandatory requirements of this document. The word **"should"** indicates a mandatory requirement with some flexibility allowed in compliance methodology. Those choosing other approaches to satisfy a "should" must be able to show that their approach meets the intent of these requirements.

2.1 ***ASTM:*** ASTM International, originally known as the American Society for Testing and Materials (ASTM), was formed over a century ago. ASTM International is one of the largest voluntary standards development organizations in the world. ASTM develops technical standards for materials, products, systems, and services.

2.2 ***Biodiesel:*** A fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats and meeting ASTM D6751, designated B100.

2.3 ***Blend:*** A blend of biodiesel with fuel oils in a specified ratio, designated Bxx, where xx is the volume percent of biodiesel.

2.4 External Laboratory: A third party laboratory that the biodiesel organization can use to test product samples.

2.5 Internal Laboratory: A laboratory that is operated or managed by the biodiesel organization.

2.6 Marketer: an entity engaged in the business of the distribution and sale of biodiesel and/or biodiesel blends of B2 or greater.

2.7 NBAC: The National Biodiesel Accreditation Commission is an autonomous committee of the National Biodiesel Board that oversees and directs the BQ-9000 program.

2.8 Organization: A producer or marketer of biodiesel or biodiesel blends.

2.9 Producer: An organization involved in the production of B100 through assets under their direct control or through a tolling arrangement. Producers can either sell B100 or biodiesel blends of B99 or higher.

2.10 *Quality Manual:* A document that describes the elements of the quality program used to assure that the requirements of this document are met.

2.11 *Quality Program:* The organizational structure, responsibilities, procedures, processes and resources necessary to manage quality.

2.12 *Verification:* Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled.

3 REFERENCES

3.1 Normative References

The following references contain provisions which, through reference herein, constitute provisions of these requirements. All referenced documents are subject to revision, and all those applying these requirements are required to apply the most recent editions of the references indicated below.[1]

ASTM D396 Standard Specification for Fuel Oils

ASTM D975, Standard Specification for Diesel Fuel Oils

ASTM D1298, *Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.*

ASTM D4052, *Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter*

ASTM D4057, *Standard Practice for Manual Sampling of Petroleum and Petroleum Products.*

ASTM D4176, *Standard Test Method for Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures)*

ASTM D6751, *Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels.*[2]

ASTM D7371, Standard Test Method for Determine of Biodiesel (Fatty Acid Methyl Esters) Content in Diesel Fuel Oil Using Mid Infrared Spectroscopy (FTIR-ATR-PLS Method)

ASTM D7467, Standard Specification for Diesel Fuel Oil, Biodiesel Blend (B6 – B20)

Form BQF-1, BQ-9000 External Laboratory Verification

[1] ASTM documents are available from www.astm.org.
[2] Any approved alternative test methods listed in ASTM D 6751 are acceptable for use in this program.

3.2 Informative References

The following reference is included as bibliographic information which may contain material useful in the application of this requirements document. Excerpts from this reference were used in the development of the requirements in this document.

ISO 9001:1994[3], *Quality Management Systems - requirements*

4 DOCUMENTATION REQUIREMENTS

The quality management system documentation shall include

a) documented statements of a quality policy

b) a quality manual

c) documented procedures required by the BQ-9000 Program

d) records required by this standard

The organization shall establish and maintain a documented quality management system containing provisions which explicitly or by reference, include the requirements contained in this document. The organization shall implement the newest revision of the BQ-9000 Marketer Program Requirements into their quality management system within 90 days of the effective date of the latest revision. The organization shall notify the NBAC when these quality system changes have been made.

4.1 Quality Manual

The quality program shall be documented in a quality manual, which meets the requirements herein including the means to ensure that B100 conforms to ASTM D6751, is appropriately blended and meets any customer specific requirements. The quality manual shall include or make reference to quality system procedures.

4.2 Quality Policy

A quality policy shall be defined and documented which includes the objectives for and commitment to quality. The quality policy shall be related to the business goals of the biodiesel operation and the expectations of its customers. The quality policy shall be invoked throughout the biodiesel operation and understood by all levels of personnel.

4.3 Quality System Procedures

Documented Quality System Procedures (QSPs) shall be prepared that describe the process to be employed for determining and documenting how operational quality requirements will be met and be consistent with the requirements herein. Procedures shall make reference to work instructions that define how an activity is performed.

[3] International Organization for Standardization (ISO). This material is reproduced from ISO 9001:1994 with permission of the American National Standards Institute (ANSI) on behalf of ISO.

4.4 Document Control

The quality program shall contain provisions for maintaining and controlling BQ-9000 quality program related documents and records. Document Control shall have at least the following:

a) A method of identifying the current document; such as a revision letter, a revision date, or an effective date on page each of the document.

b) A Document Status form that lists all documents in the Quality System the current revision of each document as defined in a) above and the effective date of the revision.

c) A distribution list of those in possession of your Quality Manuals.

d) A method for controlling the distribution of new and updated sections of your Quality System Documents. This should include a mechanism to remind the recipients to destroy the copy of the obsolete documents. This is particularly important where forms are copied in advance of use.

4.5 Control and Retention of Records

Records shall be established and maintained to provide evidence of effective implementation, operation and compliance of the organization's quality system. Records shall be retained for a minimum of two years. Records shall be legible, identifiable and accessible. The storage of quality records shall be done in a manner that ensures record integrity.

5. MANAGEMENT RESPONSIBILITY

5.1 Quality Management Representative

A quality management representative (QMR) shall be appointed and irrespective of other duties, shall chair quality management review meetings, ensure that a quality program is established and that it meets the requirements herein, report on the performance of the quality program and ensure that the most recent version of the quality documents are made available to personnel.

5.2 Internal Quality System Audits

The organization shall develop and implement a system for performing internal quality audits. Internal quality system audits of each element of the quality system shall occur at a minimum of once per year to verify that the organization's operations comply with the requirements stated in its quality management system to determine the effectiveness of the quality program. Audits should be performed by persons other than those responsible for the area being audited. Audit frequency should be increased when audit results indicate that increased frequency would be beneficial. Audit results shall be presented to personnel responsible for the audited area and cited nonconformities shall be resolved in a timely manner as defined in documented procedures. The audit process, nonconformance reports, corrective action plans, and effective corrective action shall be included in internal audit records.

5.3 Quality Management Review

Quality management review meetings shall be held at least once every six months. Records shall be kept of the review meetings. The input to management review meetings should include information on the following:

a) results of Internal Quality System Audits

b) customer feedback

c) process performance & product conformity

d) status of preventive and corrective actions

e) follow-up actions from previous management reviews

f) changes that could affect the quality management system

g) recommendations for improvement.

6 LABORATORIES

6.1 Laboratory Practices

Internal and external laboratories used by the organization shall implement the following practices.

a) Shall have copies of the current ASTM D6751 specification and of the test methods for the test being conducted in the laboratory.

b) Shall have all the required equipment and standards that are required for the testing that is being conducted in the laboratory.

c) Shall calibrate the equipment and standardize reagents at least as frequently as required by the methods for testing product to ASTM D6751 specifications. If there is not a requirement for calibrations, then a lab specific schedule shall be established for each test method used by the laboratory. Calibrations and standardizations shall be documented.

d) Shall have a training program that demonstrates competencies for testing product to ASTM D6751 specifications.

e) At least once every four months, a laboratory shall execute a documented program to verify that their testing results are accurate by sending duplicate samples out to an independent laboratory, purchasing and testing standards, or participating in an ASTM (or equivalent) biodiesel cross check program.

f) Shall determine, collect and monitor appropriate data to demonstrate the effectiveness of the testing performance.

g) Shall maintain records that indicate test results that were produced by an external laboratory.

h) Analytical results shall reference the test method specification.

6.2 Laboratory Auditing Protocol

6.2.1 Internal laboratories

Internal lab audits shall be included as part of the Internal Quality System Audits (see 5.2).

6.2.2 External laboratories

Organizations using external laboratories shall receive from the external laboratory a completed and signed Form BQF-1 with supporting documentation indicating their compliance with the requirements specified in 6.1. This form shall be completed annually by the external laboratory and shall be retained by the organization for a minimum of two years.

7 RECEIPT OF PRODUCT

A marketer has four purchase options when marketing biodiesel:

a) The marketer can purchase biodiesel from a BQ-9000 Producer.

b) The marketer can purchase the biodiesel from a non BQ-9000 Producer and verify that testing has been performed to produce a valid COA see 7.2 (see Appendix A).

c) The marketer can purchase the biodiesel from a BQ-9000 Marketer.

d) The marketer can purchase biodiesel from non BQ-9000 Marketer and verify that testing has been performed to produce a valid COA see 7.2 (see Appendix A).

The marketer shall document from whom the biodiesel fuel was purchased, their BQ-9000 status and the amount of fuel received. The marketer shall only accept product transfer documents that include an EPA registration number.

In any case**,** a representative sample of the product purchased shall be taken and retained for a minimum of 60 days.[4] This sample shall be tested per ASTM D4176 (Procedure 2, Maximum Value of 2).

7.1 Product Received from a BQ-9000 Producer or BQ-9000 Marketer

If product is received from a BQ-9000 Producer or Marketer, the BQ-9000 Marketer may accept the COA or other documentation demonstrating that the product met the limits of the tests conducted by the biodiesel producer and off-load product directly into a distribution tank.

7.2 Product Received from a Producer or Marketer that is not BQ-9000 Certified

Product received from a producer or marketer that is not BQ-9000 certified shall have certificate(s) of analysis showing the tests were performed by either an independent lab or the BQ-9000 Marketer's internal lab to verify that the product meets full ASTM D6751 specifications.

7.3 Commingling of B99 or B100 Fuel Shipments or Lots

Once the requirements of Section 7.1 or 7.2 have been met that indicate the fuel has been tested and has met the specification limits of the tests conducted, the fuel shipments or lots can be commingled with other verified lots of fuel.

[4] Retained samples ("retains") shall be kept in an environmentally appropriate location to avoid spoilage of the sample for the period of time being retained. In most cases, retention of at least one liter of fuel should be sufficient. If it is anticipated that cetane number will need to be tested from the retained sample, then an additional liter of fuel may be needed.

The cloud point of the commingled products shall be reported as either
1) The highest cloud point of the products being commingled or

2) The measured cloud point of a representative blend

The cold soak filterability shall be stated as either
1) Meeting the higher of the 360 or 200 second filterability time limits of the products being commingled or

2) The measured cold soak filterability of a representative blend

7.4 B99 or B100 Tanks with Multiple Position Holders

In a situation where a marketer distributes product from a tank where companies other than the marketer lease space, the position holders in the tank shall purchase product using the same guidelines in Sections 7 – 7.2.

7.5 Diesel Fuel & Fuel Oil as a Blend Component

Since ASTM D975 and ASTM D396 specification permits diesel fuel to be supplied with up to 5% Biodiesel content, the Marketer shall know whether the diesel fuel or fuel oil used in the Marketer's blending operations contains any percentage of biodiesel. Since the diesel fuel and fuel oil certificates of analysis may not contain information on the amount of biodiesel in the purchased diesel used for blending, the Marketer shall determine the biodiesel content through testing or by specifying the biodiesel content in the purchase contract.

8 B99 or B100 STORAGE

8.1 B99 or B100 Storage and Distribution Tanks

All B100 storage and distribution tanks should be dedicated to biodiesel service. If a tank is changed from some other service to biodiesel storage, the tank should be drained dry, cleaned, and then inspected. The inspection shall be documented.

8.2 B99 or B100 Storage Tank Sampling and Testing

Inspection and testing functions associated with the verification that specified product requirements are being met shall be defined in documented procedures. Such procedures shall include the types of inspection and testing performed and the records established by same. [5]

The procedures for final inspection and testing shall require that all specified inspection and tests have been carried out and that the results meet specified requirements. Procedures for control of nonconforming product shall be employed (see 10.1) when a product fails to pass a required inspection or test.

8.3 B99 or B100 Tank Testing

If a biodiesel storage tank has no activity (no shipments out) for 30 days, product shall not be shipped from the storage tank until an outlet sample, or a representative sample of the product according to ASTM D4057 is taken. The sample shall be tested for water and sediment per ASTM D4176 and for Oxidation Stability per ASTM D6751. If the sample fails to meet specification, the production lot shall be isolated and the procedures for the control of

[5] Organizations should check with their laboratories to determine the optimal volume of fuel needed for testing the product and for acceptable shipping containers and procedures.

nonconforming product shall apply.

Analytical results shall be documented. If the product is out of specification the appropriate corrective action shall be taken including documentation.

9 FUEL BLENDING AND DISTRIBUTION

9.1 Fuel Blending (see Appendix B)

During the process of creating a biodiesel blend, the blending operation shall be monitored to assure adequate mixing of the products in the correct proportions. This includes measuring and recording the volumes and blend levels as verified through bills of lading, meter printouts or other auditable records of both the biodiesel and diesel fuel, which comprise the blend. These records shall be kept for a minimum of two years.

Validation of the blending process shall be as follows:

9.1.1 Blend homogeneity is measured by obtaining samples at the upper, middle and lower regions of the vessel per ASTM D4057, Standard Guide for the Sampling of Petroleum Products.

9.1.2 To validate the blending process three consecutive blend lots shall be tested for each blend range that the Marketer plans to distribute.

9.1.3 The sample or samples shall be analyzed for percent biodiesel using ASTM D7371, Determination of Biodiesel Content in Diesel Fuel. The % methyl ester in each of the level samples must be within 0.50% by volume for blends less than or equal to B5 and 1.0% by volume for blends greater than B6.

9.1.4 The validation test results shall be recorded and retained for a period of two years.

9.1.5 Once initial validation has been completed, the validation shall be performed annually by requiring one test for each blend range of product distributed per 9.1.3.

9.1.6 If a Marketer has both rack blending and storage tank blending, blending validation shall be performed on both systems.

9.2 Storage and Distribution Tanks Containing Blended Biodiesel

All blend tanks should be dedicated to biodiesel blend service. If a tank is changed from some other service to biodiesel blend storage or distribution, the tank should be drained and cleaned prior to use. The inspection shall be documented.

9.3 Blended Fuel Tank Testing (See Appendix C)

An outlet sample taken from the blend tank (when there is no activity over a 30 day period) shall be tested for moisture and sediment using ASTM D4176, (Procedure 2, Maximum value of 2). If out of specification, corrective action with documentation is required.

9.4 Trucks, Railcars and Vessels Containing Biodiesel and Blended Biodiesel

The quality program shall provide cleanliness specification standards that address material and chemical compatibility issues, inspections and cleanliness for trucks, railcars and vessels used for distributing biodiesel and biodiesel blends in a BQ-9000 Marketer's supplied trucks, railcars and vessels. All trucks, railcars and vessels shall be drained and inspected prior to loading if

the previous load contained a product that would contaminate the biodiesel (e.g., gasoline, ethanol, methanol, lube oils, raw vegetable oil or animal fats). This would include dyed products and products in excess of 15 ppm sulfur when the biodiesel is destined for ULSD applications.

Agreements and/or contracts with transport companies shall state, explicitly or by reference, the cleanliness standards that shall be complied with before hauling biodiesel. The producer shall periodically verify that the transport companies are meeting the cleanliness specifications.

10 REMEDIATION ELEMENTS

10.1 Nonconforming Product

The organization shall develop documented procedures that will ensure that product is prevented from unintended use or shipment if it is found to be nonconforming. Controls shall be defined that provide for identification, documentation, evaluation, segregation (when practical), disposition of nonconforming product, and for notification to the functions concerned. Personnel with the authority to review and "sign-off" on the disposition of nonconforming product shall be identified. The review of nonconforming product shall be conducted according to the documented procedures. The disposition of nonconforming product may be categorized as:

a) reprocessed to meet specification

b) re-classified to another non-motor vehicle fuel application

c) rejected or destroyed.

If product is reprocessed, it shall be re-inspected to assure it meets specification. The re-inspection shall be documented.

10.2 Corrective and Preventive Action Procedures

Corrective and Preventive Actions shall be managed through the use of documented procedures. Records shall be maintained for corrective and preventive actions. Corrective actions shall be issued in response to product quality nonconformities (including both internally identified and customer complaints related to product quality) and identified nonconformities related to processes of the Quality Management System (including internal and external audits).

For Corrective Actions, the procedure shall require the clear statement of the nonconformity; assignments of responsibility for definition and completion of the corrective action; identification of root cause; identification of the corrective action(s) that are intended to prevent recurrence of the nonconformity and verification of the effectiveness, at an appropriate interval following the implementation of the corrective action, of the action. Corrective actions shall not be closed until verification of effectiveness activities have been completed and recorded. Records of corrective actions shall be documented using a form that supports the above required processes.

For Preventive Actions, the procedure shall require the clear statement of the condition that could result in a nonconformity (either related to product quality or processes of the Quality Management System); assignments of responsibility for the definition and completion of the preventive action and the identification of the preventive action(s) that are intended to prevent the occurrence of the nonconformity. Records of preventive actions shall be documented via memos and/or the use of forms implemented for corrective actions.

Appendix A
(informative)
Marketer Process Flow
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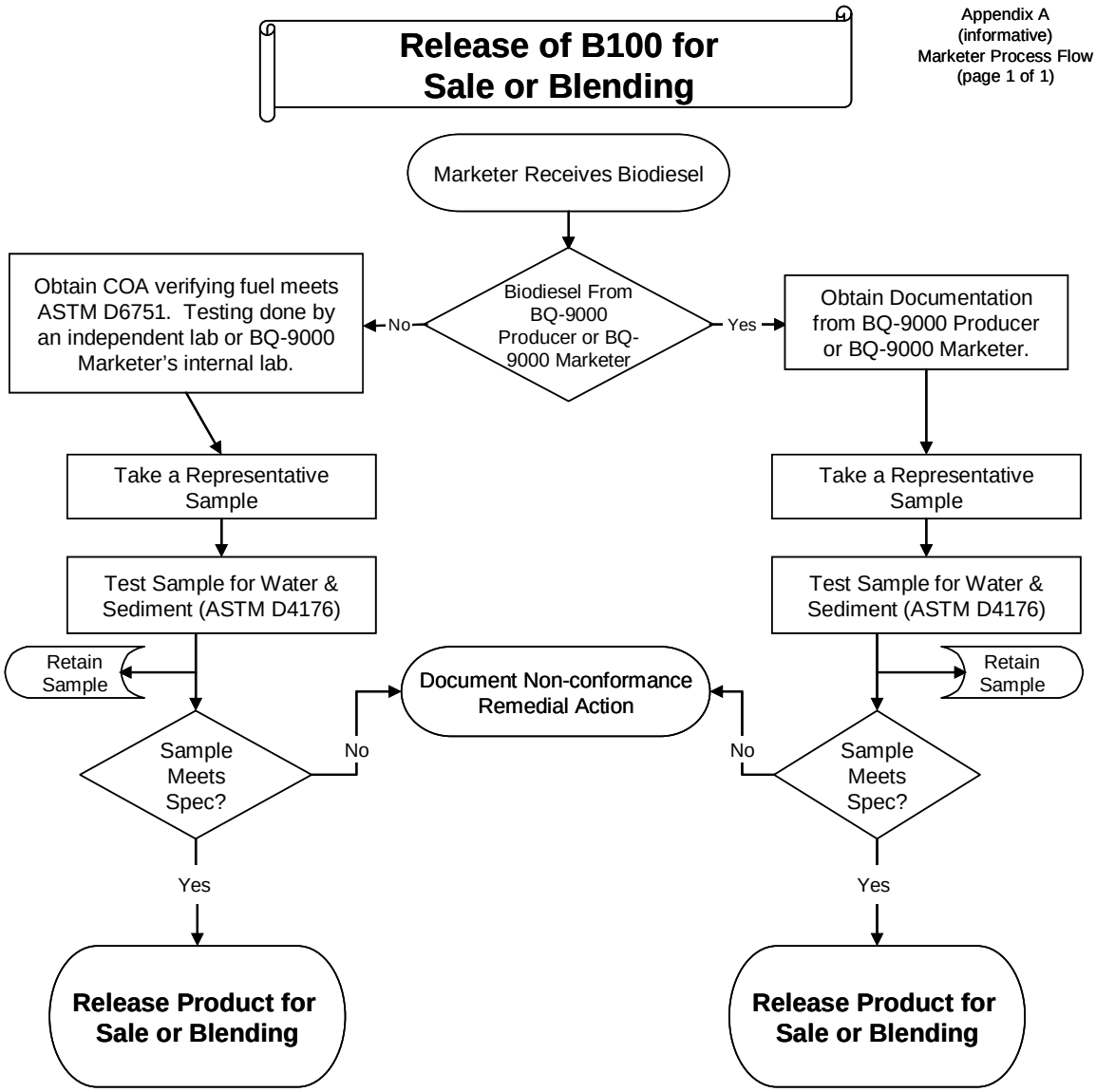
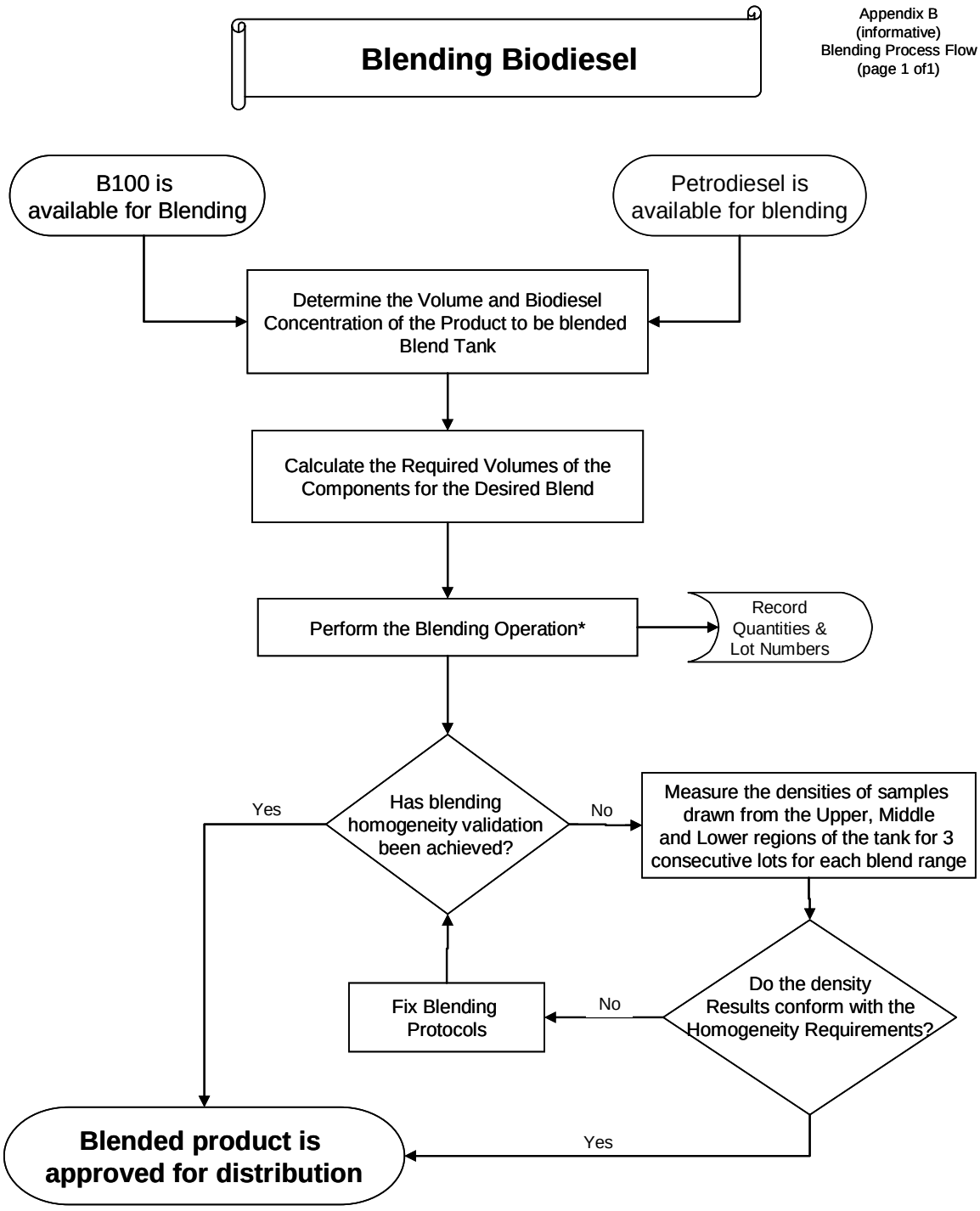


Appendix B
(informative)
Blending Process Flow
(page 1 of1)



*Assure tank cleanliness standards are met, especially if tank service changes.

Appendix C
(informative)
Blending Process Flow
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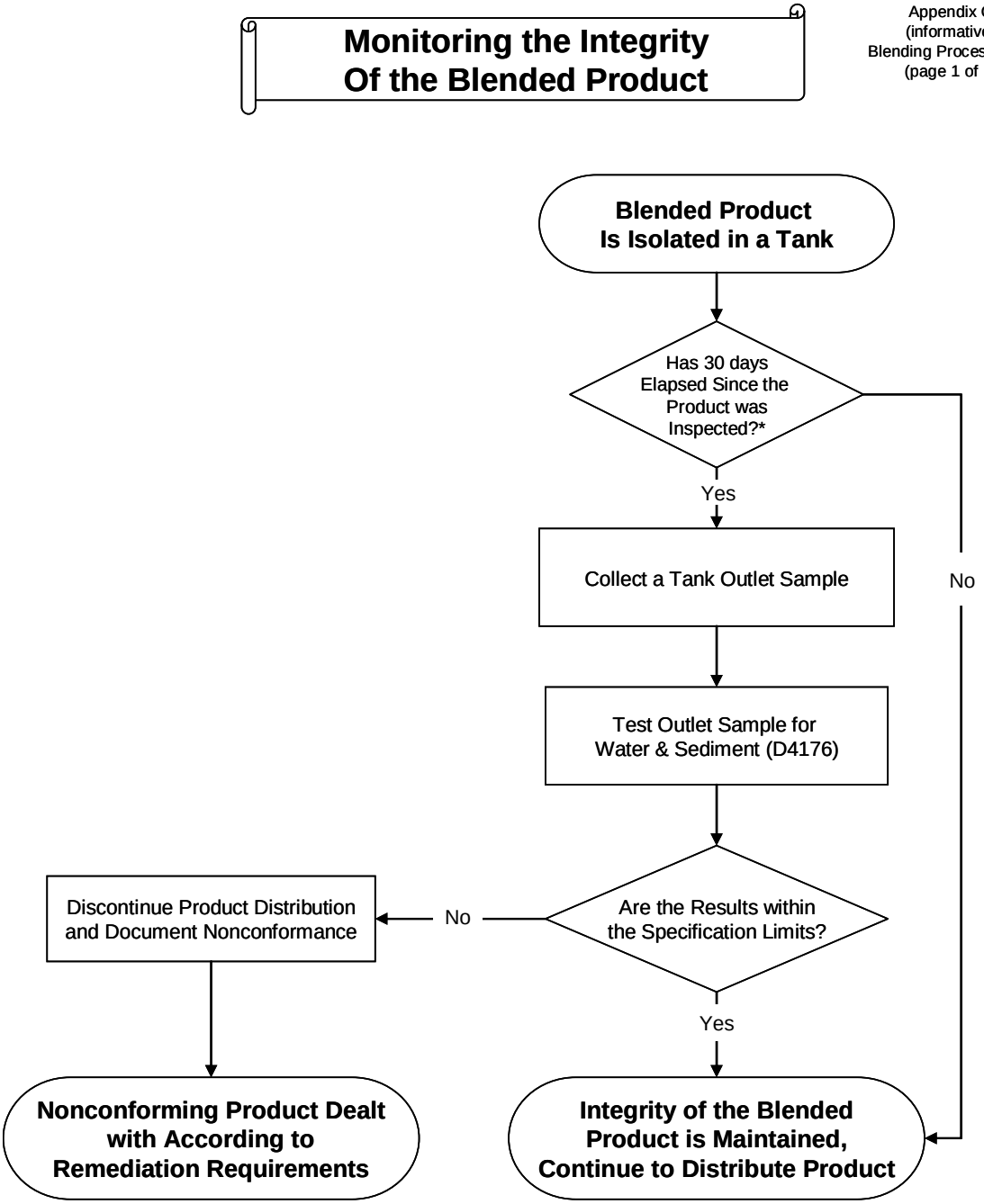

*Under specific storage conditions it may be prudent to conduct more frequent product inspections.