FS 2023 - 2 - Consultation

Ethanol Blended Gasoline E85 Importation and Consumption

Publication Date: 11 December 2023

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A. Introduction

1. The Utility Regulation and Competition Office ('OfReg' or the 'Office') is the independent multi sector regulator with responsibility for the key utilities providers in the Cayman Islands, including the fuel sector ('Fuel Sector'), in addition to the electricity, information and communications technology ('ICT'), water, and wastewater sectors.

2. Different decisions by the Office will affect persons and organisations throughout the country in different ways. It is therefore important that the Office makes regulatory decisions and proposes new regulations with the appropriate input from persons with sufficient interest or who are likely to be affected by the outcome of such decisions. Consultation is an essential aspect of regulatory accountability and transparency and provides the formal mechanism for these persons to express their views in this manner. The requirement for the Office to consult is mandated in its enabling legislation.

3. Pursuant to its enabling and foundational legislation, the Office has established a Fuel Standards Committee to consider the quality standards of ethanol blended gasoline E85 with an ethanol content of between 70 – 85% by volume in gasoline for importation and consumption in the Cayman Islands.

4. In order for the Office to effectively and efficiently carry out its duties regarding our regulatory remit, the Office sees it necessary to submit a standard for ethanol blended gasoline E85 type ("E85") to guide importers with quality standards for importation, storage, handling and distribution.

5. The purpose of this consultation paper is for the Fuel Standards Committee's subcommittee members to examine the E85 to determine its fit for the Cayman Islands.

B. Legal Framework

6. The Office is guided by its statutory remit to ensure there are standards for fuels imported into the Cayman Islands.

7. The Utility Regulation and Competition Act (2021 Revision) (the 'URC Act') is the principal legislation governing the Office's mandate with respect to the Fuel Sector. Alongside the URC Act, the sector-specific legislation governing the Fuel Sector are the Dangerous Substances Act (2022 Revision) (the 'DS Act') and its supporting Regulations ('DSR'), and the Fuel Market Regulation Act (2017) (the 'FMR Act').

8. Regulation 31 of the DSR states:

   ***31**. The standards applicable to dangerous substances imported into the Islands shall be the standards set by the Fuel Standards Committee in accordance with the Law and every person to whom an import permit is granted shall ensure that the dangerous substance imported by him accords with such standards.*

9. Section 9A (1) of the DS Act states:

"There is established a Fuel Standards Committee to carry out the duties specified in this Law and the Committee shall consist of –

(a) the Chief Fuels Inspector who shall be chairperson;

(b) the Director of the Department of Environmental Health or his nominee;

(c) the Director of Environment or his nominee;

(d) the Director of the Water Authority or his nominee; and

(e) Repealed by section 8 of Law 52 of 2016.

10. Section 9A (3) of the DS Act states:

(3)The Committee may appoint or empanel sub-committees, whether from among members of the Committee or from among persons outside of the Committee or both, to study and make recommendations to the Committee on any aspect of the regulation of fuel quality and related issues referred by the Committee.

11. Section 9A (4) of the DS Act states:

(4) Members of a sub-committee who are not members of the Committee are required to have-
(a) relevant scientific or technical knowledge in the area of fuel quality standards; or
(b) qualifications in chemistry, biology or environmental studies,
or both such knowledge and qualifications; and such members shall be paid allowances as the Board may determine.

12. Section 9B of the DS Act States:

9B. The Committee shall carry out such duties as are specified in this Law and in regulations and such duties may include -

(a) establishing the standards of certain types of fuel to be imported, distributed and used in the Islands;

(b) publishing or causing to be published, in such medium as they determine, such standards and the testing methods to be used by importers and the Chief Fuels Inspector in the inspection of fuel in order to ensure compliance with the standards; and

(c) providing quarterly, bi-annual, annual or such other periodic reports to the Minister on its operations.

13. Section 9(D) of the DS Act states

9D. (1) Where, after inspections are carried out in accordance with this Law, it is found by the Chief Fuels Inspector or by an inspector that an importer has been importing and distributing to operators fuel which does not accord with standards published under section 9B, the Chief Fuels Inspector shall require the importer to comply forthwith with any written direction not inconsistent with this Law which

the Chief Fuels Inspector believes on reasonable grounds is necessary to ensure that the importation or distribution of such fuel is immediately discontinued.

(2) An importer who fails to comply with a direction under subsection (1) commits an offence and is liable to an administrative penalty; and the relevant import permit of such person may be suspended, or revoked in accordance with the procedure set out in this Law.

(3) An importer who, more than once in any period of one year, imports and distributes fuel which is found by the Chief Fuels Inspector not to be in accordance with the standards set by the Fuel Committee commits an offence and is liable to an administrative penalty; and the relevant import permit of such person may be suspended, or cancelled in accordance with the procedure prescribed by this Law.

C. Background

14. An application for an import permit was received by the Office to approve the importation of ethanol blended gasoline E85 as an alternative fuel for consumption in the Islands.

15. The Office undertook research into the specifications of parameters comprising E85 was undertaken to determine E85 quality standards. The Office then prepared a Committee paper to be presented to the Fuels Standards Committee ('FSC') in order for the committee to consider and decide on the introduction of E85 to the local market.

16. The quality standards for ethanol blended gasoline E85 type (E85) is set out in Appendix 1. As detailed in ASTM D5788 there are four ASTM volatility classes for E85 and based on ambient temperature of the Cayman Islands, the ASTM volatility is Class 1. For a Class 1 region the ethanol in the gasoline must range from 70 – 85% per volume for E85.

17. The Office holds the position that, if approved by the FSC, all fuelling equipment for the storing and handling must be compatible for E85, labelled identifying if for E85 and solely used for E85 and no other ethanol blended fuels. To ensure quality of E85 while being stored and handling at the retail site, there must be a means of monitoring the water content given the hygroscopic nature of ethanol. Other quality checks as set up in the E85 must also be monitored. In addition, flexible fuel vehicles (FFV) are ideal for the E85 fuel and non FFV must be discouraged from using it.

18. The Office also determined that there would be a need to educate the public and this must be the responsibility of the importer and operator.

19. The Office decided to consult on the introduction as a part of its research and technical advice to be presented to the FSC.

Consultation Questions

20. Based on the above, the Office invites subcommittee members to submit their comments, with supporting evidence, on the following questions:

Question 1:
What are your views on E85 fuel, and are there any concerns of adding this fuel to the fuel mix of the Cayman Islands?

Question 2:
Please review the E85 thoroughly and provide any feedback, concerns or questions you may have, as it relates to the various parameters of each specification and testing methods.

Question 3:
Are there any other critical storage and handling equipment which must be compatible with E85, labelled and identify for E85 only?

Question 4:

Should there be a pump attendant at the nozzle alerting consumers to the E85? Should consumer be responsible for labelling their tank nozzle to alert pump attendants of their vehicle compatibility to E85?

Question 5:
What is the suggested colour to identify E85 fuel on the storage tank, pump nozzle, consumer's fuel tank?

Section 7 Statement

21. This consultation is conducted in accordance with the Consultation Procedure Guidelines determined by the Office according to the Utility Regulation and Competition Act (2021 Revision) (URCA) as revised. These guidelines can be found on the Office's website.

22. The Office considers that because the E85 is published as part of this consultation, this consultation will be conducted as a single-phase consultation over a period of twenty one (21) days. Where, upon review of the responses to this consultation, it becomes clear that a second phase of consultation is required, a further notice will be issued accordingly.

23. All submissions on this consultation should be made in writing, and must be received by the Office by 5 p.m. on 2 January 2024 at the latest.

24. Submissions may be filed as follows:

    By email to:
    fuels@ofreg.ky and Consultations@ofreg.ky

    or by post to:
    Utility Regulation and Competition Office
    P.O. Box 10189
    Grand Cayman KY1-1002
    Cayman Islands

    or by courier to:
    Utility Regulation and Competition Office
    3rd Floor, Monaco Towers II
    11 Dr. Roy's Drive, George Town
    Grand Cayman
    Cayman Islands

The Office expects to publish a determination regarding the Proposed Amendment to the E85 by 31 January 2024.

25. Appendix 1

Proposed – Ethanol Blended Gasoline E85

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Utility Regulation and Competition Office

Committee Paper:

Facilitating the Introduction of Ethanol Blended Gasoline E85 Type into the Fuels Mix pursuant to Section 9A – 9D of the Dangerous Substances Law (2017 Revision).

OfReg Fuels Division
Phone: (345) 946 4282
Email: fuels@ofreg.ky
Website: www.ofreg.ky

COMMITTEE PAPER

A. Proposal

The Committee is hereby requested to consider and approve the importation and consumption of E85 for the Cayman Islands, subject to conditions.

B. Executive Summary:

1. An application was made to the Office under the provision of Section 3(5) of the Dangerous Substance Act 2017 Revision (as revised) (DSA) for an import permit for E85 ethanol blended gasoline. E85 refers to ethanol blended gasoline containing 51 to 83 percent of ethanol (as volume) blended into gasoline and it is typically sold for the flexible fuel vehicles (FFV) market. It is considered as an alternative fuel and the Cayman Islands' National Energy Policy (NEP) has identified alternative fuels as one which shall be promoted to reduce harmful emissions.

2. The American Society for Testing Materials (ASTM) D5798-21 has established specifications for E85 fuel where parameters, specifications and testing methods have been developed. It is being proposed that this standard forms part of the Fuel Quality Standards for the Cayman Islands along with specifications (once deemed appropriate) found in the Australian Fuel Quality Standards 2019 determination.

3. With E85 there is a seasonal and geographical volatility to be considered when blending ethanol with the gasoline. ASTM has identified four (4) different volatility classes and based on their criteria; Cayman Islands is categorized as a class 1 region where the ethanol content in gasoline must range between 70 to 83 percent of ethanol in volume. These two properties along with others contained in Table 4 comprise the proposed quality standard for Cayman Islands and must be contained in the Certificate of Quality (COA) for each importation.

4. The storage and handling requirements insist that equipment handling and storing ethanol blended gasoline E85 must be UL listed and E85 compatible. These requirements diminish the risk of material failure and help to ensure proper function where E85 fuel is in direct contact with these components.

5. Labelling for identification of tanks and dispensers is an operational requirement for the purpose of ensuring there is no comingling either in the storage tanks or vehicles' tank. This is to avoid the very expensive procedures of purging and cleaning the tanks and engine components and engine performance.

6. An overview of the risks associated with comingling of other gasolines grades currently being imported and it was determined that the risk can be categorized as low to medium once the mitigation measures are in place, public education by the operator, forecourt personnel are properly trained to assist consumers and an OfReg public awareness programs to alert consumers of possible effects of mixing gasolines.

7. The commercial viability for E85 could not be determined given that the Office does not have any market data on FFV used in the Cayman Islands and market research for the need for this type of fuel for the Cayman Islands. The Office appreciates that E85 will likely be for a niche market for motor racing community given its high anti-knock index of 95 to 97.

C. Background:

8. The Dangerous Substances Act (as revised) sets out that the Fuel Standards Committee (FSC) shall evaluate and make sound determination on the establishment of fuel standards in the Cayman Islands. In 2017, the FSC had approved E10, an ethanol blended gasoline, which has been added to fuel mix for the Cayman Islands with no reported negative impact. E10 has also formed part of the draft Fuel Quality Standards which will undergo public consultation in short order.

9. The National Energy Policy (NEP), Fuel Sector Strategy, gives consideration for the promotion of alternative fuels in the mix of fuels used for transportation. It advises that the technical and commercial viability be explored for such alternative fuels. E10 and biodiesels are already part of the fuels mix and if E85 is added, it being of a higher content of ethanol blended gasoline, it will add a new dimension to the fuel mix of the islands. However, careful consideration must be given to determine what changes, if any, there will be on the driving landscape of the Cayman Islands. To be clear E85 is an alternative fuel as determined by the NEP and as such it must be considered for all future deliberations.

10. Ethanol (ethyl alcohol-EtOH) can be produced from biomass (sugar cane, grain straw, maize, seaweed) and as such is renewable, unlike petroleum-based fuel. EtOH is a flammable, colorless liquids with a faint alcohol odor. The colour of ethanol/gasoline blends depends on the colour of the gasoline in the blend[1].Almost all gasoline cars manufactured after 1980 can drive with fuel containing 10% ethanol (E10). For blends up to 83 percent ethanol only newer FFV are suitable to operate. A FFV is a vehicle with an internal combustion engine which can operate on

[1] U.S. Department of Energy - Energy Efficiency & Renewable Energy – "Handbook for Handling, Storing, and Dispensing E85 and Other Ethanol-Gasoline Blends", February 2016

gasoline blends of ethanol up to 83 percent. Major car manufacturers build FFV, but it appears that not all models are FFV. Typically, FFV are identified by yellow gas caps on their fuel tank and some capless fuel tanks have a yellow ring around where you insert the fuel nozzle.

11. Ethanol blended gasoline is used and available in USA, UK, Brazil, Canada, Australia, India, Jamaica and throughout the EU. In the Caribbean E10 is not widely used or available and E85 is not used or available.

D. Proposed E85 Standard:

12. Currently ethanol blended gasoline of 87 AKI and 93 AKI grades are imported into the country. The E10 gasolines currently on offered on island are 87, 90 and 93, E10 gasoline is also offered through mobile refueling service.

13. On 16 August 2023, an application for an import permit for E85 ethanol blended gasoline was made under Section 3 of the DSA. The intention to offer E85 at a retail fuel facility was also signaled with an accompanying operating permit application.

14. E85 type gasolines have ethanol blends ranging from 51 to 83 percent of ethanol depending on geography and season. It is also known as flex fuel and it is an alternative motor fuel authorized by the Energy Policy Act of 1992, Section 301(2) of the United States of America (USA). ASTM D5798, “Standard Specification for Ethanol Blends for Flexible-Fuel Automotive Spark-Ignition Engines” is the standard that covers the requirements for automotive fuel blends of ethanol and gasolines for the use of ground vehicles equipped with ethanol fuel blend flexible fuel spark-ignition engines. This standard was last updated on 13 October 2021. See Tables 1 for Properties of Fuel Ethanol and E85 and table 2 for comparison data of the Fuel Properties of Ethanol, Gasoline and E85.

Table 1: Properties of Fuel Ethanol and E85

Property	Comment
Vapor Density	Ethanol vapor, like gasoline vapor, is denser than air and tends to settle in low areas. Ethanol/gasoline blends, including E85, should be treated like gasoline blends with respect to handling and safety.
Solubility in Water	Ethanol is extremely hydroscopic (i.e., attracts water). Water should be removed to the extent possible from fuel ethanol handling, storage, and distribution equipment. A small amount of water is soluble in E85, but at higher concentrations, the gasoline portion will separate from the ethanol/water mixture.

Energy Content	For identical volumes, ethanol contains approximately 30% less energy than gasoline, depending on the gasoline formulation. As a result, vehicle fuel economy of E85 can be expected to be reduced by about 25%, depending on the gasoline formulation and the individual vehicle.
Flame Visibility	A fuel ethanol flame is less bright than a gasoline flame but is easily visible in daylight.
Specific Gravity	Pure ethanol and ethanol/gasoline blends are slightly denser than gasoline
Conductivity	Ethanol and ethanol blends have increased electrical conductivity compared to gasoline. This can affect materials compatibility due to increased corrosion of certain metal junctions and exposed electrical connections.
Air-Fuel Ratio	Due to the oxygen content in ethanol, the ideal or "stoichiometric" air-fuel ratio for E85 is a lower value than it is for gasoline (i.e., fewer pounds of air per pound of fuel). FFVs are designed to detect ethanol and properly adjust the air-fuel ratio.
Toxicity	Pure ethanol in small amounts is not toxic and is not considered carcinogenic; however, fuel ethanol and ethanol/gasoline blends must be treated as toxic and carcinogenic due to the addition of hydrocarbons and gasoline.
Flammability	Depending on the hydrocarbon blending component, the vapor concentration in the storage tank head space of many E85 blends can fall into the flammable range. This is a concern primarily at low ambient temperatures.

Table 2: Fuel Properties of Ethanol, Gasoline and E85

Property	**Ethanol**	**Gasoline**	**E85***
Chemical Formula	C2H5OH	C4 to C12 Hydrocarbons	C4 to C12 Hydrocarbons and Oxygenated Hydrocarbons
Main Constituents (% by Weight)	52 C, 13 H, 35 O	85-88 C, 12 – 15 H	57 C, 13H, 30 O
Octane (R+M)/2	113	86-94	95 - 97
Lower Heating Value (Btu per gallon)	76,300	116,900	83,600 – 95,450
Miles per Gallon Relative to Gasoline	67%	-	73%**
Reid Vapor Pressure (psi)	2.3	7-16	7-12
Ignition Point-Fuel in Air (%) Temperature (approx.) (*F)	3-19 850	1-8 495	Varies Varies

Specific Gravity (60*/65*F)	0.794	0.72-).78	0.78
Air Fuel Ratio (by Weight)	9	14.7	10
	3.0	1.85	2.75 – 2.95

*Depends on hydrocarbon blending component properties. **Depends on both vehicle model and percentage ethanol in fuel

ASTM Volatility Class:

15. The ethanol content of E85 is seasonally adjusted to improve cold start and warm up performance. The volatility classes for E85 are detailed by ASTM D5798 where vapour pressure can vary depending on seasonal and climatic changes. The volatility classes are as follows:

    Class 1 – Encompasses geographical areas with six (6) hour tenth percentile minimum ambient temperature of greater than 5°C (41°F)

    Class 2 – Encompasses geographical areas with six (6) hour tenth percentile minimum ambient temperature of greater than -5°C (23°F) but less than or equal to 5°C (41°F).

    Class 3 – Encompasses geographical areas with six (6) hour tenth percentile minimum ambient temperature greater than -13°C (9°F) but less than -5°C (23°F).

    Class 4 – Encompasses geographical area with six (6) hour tenth percentile minimum ambient temperature less than or equal to -13°C (9°F).

16. Given Cayman's geographical location and seasonal conditions where the ambient temperature range in summer is between 24 to 32°C and during winter between 22 to 30°C, the ASTM volatility class for ethanol blends in this range falls under class 1. The acceptable associated vapour pressure in class 1 is between 5.5 and 9.0 psi when using either test method D4953 or D5191.

17. Table 3 details the relationship between the volatility classes and their vapour pressure. Given that gasoline and ethanol are volatile substances and that high vapour pressures indicate a high volatility; then with the class 1 E85 blend, engines performance is not affected at the lower vapour pressure with the higher percentage ethanol blends. This vapour pressure is measured as dry vapour pressure equivalent and it varies among classes due to driveability requirements as ambient temperatures changes. Driveability is the degree of smoothness and steadiness of acceleration of an automotive vehicle. Therefore, E85 ethanol to gasoline ratio must produce a vapour pressure between 5.5 and 9.0 for FFV to have good driveability at ambient temperatures.

Table 3: ASTM Volatility Classes for E85 per ASTM D5798				
Property	Value of Class			
ASTM Volatility Class	1	2	3	4
Vapour Pressure (psi)	5.5 – 9.0	7.0 – 9.5	8.5 - 12	9.5 – 15.0

18. According to the National Renewable Energy Laboratory (NREL) of the US Department of Energy, national 2010 2011 survey of E85, the percentage of ethanol content for E85 tends to have an inverse relationship to vapour pressures; so where the vapour pressure is low, the ethanol content is high. Cayman Islands, a class 1 region, the percentage of ethanol in the blend will be expected to be higher and from NREL survey the average ethanol blend from the samples tested for class 1 areas is 80%.

Storage and Handling Management

19. This section of the paper considers the impact of E85 on materials used for the storing and handling of E85. Focus is placed on the critical set of equipment involve and not all the components found at a retail station.

20. Research has indicated that materials commonly used with gasoline may be incompatible for high concentrate ethanol blends. ***"Blends below E25 do not cause corrosion of metals (unless accompanied by a separate aqueous phase).*** Given that E85 is a higher blend careful consideration must be given to the materials used with the storage and handling. ***E85 acts like a cleaning agent and will initially mobilize sludge in storage tanks. "E85 can also cause corrosion of some soft metals and reduce the tensile strength of some nonmetallic materials. Zinc, brass, lead, and aluminum have shown sensitivity to degradation with E85. Terne-plated steel (lead-tin alloy coating), which has been commonly used for vehicle fuel tanks, and lead-based solder are also incompatible with E85. Use of these metals should be avoided. Unplated steel, stainless steel, black iron, and bronze have shown acceptable resistance to E85 corrosion."***

Underground Storage Tanks (USTs)

21. The Operator must demonstrate that the construction materials of the UST are compatibility for E85 by one of the following options:

(1) An internationally recognized, independent testing laboratory certification or listing for the equipment used for the fuel stored; or•

(2) Approval from the equipment or component manufacturer for use with the fuel stored. This statement affirming compatibility must be in writing and list the specific ranges of biofuel blend with which the equipment or component is compatible.

22. The Operator must colour code and label the E85 tank's covers clearly identifying and distinguishing this tank from the other tanks. The recognized colour for E85 is yellow with E85 stencil in black and position in the centre of the covers.

Pipes

23. All pipes must be compatible with the UL 971 “Standard for Safety Nonmetallic Underground Piping for Flammable Liquids” and manufacturer’s listing must indicate for ethanol blends up to E100. These pipes must have a primary and secondary containment and terminate inside sumps which must also be compatible with E85.

Submersible Turbine Pump (STP)

24. STP must be UL listed and compatible with E85.

Dispenser & Associated Accessories

25. The dispenser and the accessories, such as, shear valves, breakaways, swivels, nozzles and hoses must be UL listed and compatible for E85. The dispenser must be fitted with filters of nominal rating of 50% for particles 5 microns or larger or 99% for particles 10 microns or larger.

26. Retail Dispenser Labelling. – All retail dispensing devices must identify conspicuously the type of product, the grade of the product, and the applicable automotive fuel rating. This label must follow the US Department of Energy labeling requirement and the nozzle boot must also be yellow.

Dispenser Nozzle Size – Diameter = 13/16”

Fuel Quality Management

27. Fuel quality management must be considered from two perspectives which are “offshore and onshore” where offshore will identify the parameters, specifications and testing methods to ensure there is a standard quality E85 blended gasoline imported on a consistent basis. Onshore will address operational procedures by the Operator at their facility to maintain the quality of fuel while being stored and distributed from their retail and/or bulk storage outlets.

Offshore Fuel Quality

28. Table 4 outlined the specifications for E85 re: ASTM 5798 – 21. These requirements must form part of the certificate of analysis (COA) from an ISO certified (ISO/IEC 17025) lab and be submitted for review and file prior to the fuel entering the Cayman Islands.

Table 4: Fuel Quality Standard for E85

Item	Parameter	Specification	Testing Method
1	Acidity – as acetic acid	0.005% m/m maximum	ASTM D7795
2	*Benzene	0.35% v/v maximum	ASTM D5580
3	Copper	0.07 mg/L maximum	ASTM D1688
4	^Distillation–final boiling point	225°C maximum	ASTM D86

5	*Ethanol – ASTM Volatility Class - 1	70 – 85%% v/v	ASTM 6839
8	*Lead	5mg/L maximum	ASTM D3237
9	Methanol	0.5% v/v maximum	ASTM D5501
10	Motor Octane number (MON)	87 minimum	(see note)
11	^Oxidation Stability	240 minutes minimum	ASTM D525
12	pHe	6.5 – 9.0	ASTM D6423
13	Inorganic chloride	1.0mg/Kg maximum	ASTM D7319 or D7328
14	Research octane number (RON)	100 minimum	See note
15	Solvent washed gum	5.0mg/100 mL maximum	ASTM D381
	Unwashed gum	20.0mg/100mL	ASTM D381
17	Sulfur	80.0 mg/Kg maximum	ASTM D5453 or D7328
18	Vapour pressure – ASTM Volatility Class - 1	38-62 kPa (5.5 -9.0 psi)	ASTM D5191
19	Water	1.0% m/m maximum	ASTM E1064, D7923 or E203

*Australia Fuel Quality Standards (Ethanol E85) Determination 2019

^ASTM D5798 -21 Table 2: Requirements for Hydrocarbon blendstock

Note: Testing methods for determining the MON and RON of E85 are not yet available. The minimum targets specified in the table are interim targets until a testing method is available. These minimum targets allow for engine calibration.

Onshore Fuel Quality

29. It is difficult to anticipate the frequency at which E85 will be replenished in their storage tanks and as such there are some operational precautions as advised by US Department of Energy to assure fuel quality. They recommended the following items to be checked every one or two months depending on how frequently the fuel is used.

I. Particulate content – Samples are taking from the top, middle and bottom of the tank. If present, water and particulates will show in the bottom sample. The middle sample will specify the degree of settlement of any contaminants and the top will provide an indication of what can be achieved if the fuel is to be polished.
II. Electrical conductivity – Sample taken from the tank and tested using an approved conductivity instrument in conformity to test method ASTM D2624.
III. Reid vapour pressure – Specimen is place in test chamber and allowed to reach thermal equilibrium at the test temperature, 37.8°C (100°F), and the pressure is measured using a pressure transducer sensor and indicator.
IV. Hydrocarbon content – Analysis can be undertaken using high-resolution gas chromatography.

V. Water content - Not all water detection pastes are effective in the presence of EtOH. Advice should be sought from the manufacturer or supplier that the paste is appropriate for alcohol blend fuels. If water, or a water/EtOH phase, is found to be present at the bottom of a tank, it should be pumped out immediately. Care should be taken with this water, or water/EtOH as it may be flammable and toxic. It is recommended that gas in your vehicle fuel tank should be replaced every 2 to 3 weeks to avoid alcohol and water related engine problems.

30. Given the above, in the event of a questionable fuel quality there are no facilities in the Cayman Islands to test and verify the quality of E85. Therefore, samples will be exported to verify quality at the operator's expense.

E. Risk Analysis:

31. E85 presents a risk of causing vehicles to perform poorly, especially if inserted in a non FFV. Therefore, proper signage and public education on the pros and cons of the product will assist the consumers to made inform decisions about E85. Consumers that are unfamiliar with the fuel specifications requirements of their vehicle including they that currently used E10, run the risk of causing damage to their vehicle because E10 can be used on all models of vehicles and this is not the case for E85. However, there is no indication from research that E85 can cause irreparable damage to a vehicle. Pump attendant who are not trained to identify flex-fuel vehicle (FFV) can ill-advice customers which can result in customer's expectations not being met. Public education, training of pump attendants and proper signage are essential to reduce the risk. The risk of associated with the used E85 is low to medium. The market for this fuel is not significant given that the majority of vehicles are not FFV. This risk can be mitigated with the public education on E85 and FFV.

F. Conclusion

32. This fuel is more compatible with FFV suggesting that carefully consideration must be given by consumers if it is to be used in non FFV. The consumer using this fuel can expect a reduction in fuel economy resulting in a higher cost to operate.

33. The storage and handling on this fuel is not a major concern once the operator demonstrates by providing information from the equipment manufacturer that material used for the fabrication of their equipment is compatible to E85 and that it is UL Listed.

34. All E85 imported must be of ASTM volatility class of 1 and the ethanol content must be in the range of 70 – 83% per volume blended with gasoline.
35. The certificate of analysis (COA) must meet the specifications as outlined in table 4 in this paper. Some of the specifications as detailed were identified in the drafted Fuels Quality Standard and others were taken from Australia Fuel Quality Standards (Ethanol E85) Determination 2019.

36. There is no indication on the consumption rate of E85 and as such there maybe product remaining in tanks for long periods and there are no laboratory services available in Cayman to test the quality fuel in the tanks to ensure fuel quality.

G. Recommendation to the Committee:

37. Accordingly, the Office is requesting that the Committee approves the importation and consumption of E85 for the Cayman Islands.

38. The Office holds the position that the introduction of E85 enhances the alternative fuels mix for the Cayman Islands and this ensures the Office alignment with the NEP.

[END]