# Ethanol in the LCFS

Public Working Meeting for Stakeholder Groups
January 31, 2017

## Discussion Outline

- Introduction
- Fuel Pathways [45 minutes]
  - Simplified CI Application Forms
  - Allocating Fuel Volumes by FPC
  - Multiple Co-Product Pathways
  - Default or User-Specific Inputs for Feedstock Transportation
  - Other Potential Changes to Application Requirements
- Fuel Reporting [45 minutes]
  - Reporting Standardized Volumes for Liquid Alternative Fuels
  - System Check for Total Amount (TA) of Fuel for each FPC
  - Reporting Exports of Ethanol and Fuel Blend Containing Ethanol
  - Quarterly Reconciliation with Counterparties in the LRT-CBTS
  - Fuel Obligation Transfer Period
- Third Party Verification [45 minutes]
- Next Steps

Tier 1 Pathways for Starch-Derived Ethanol

## FUEL PATHWAY EVALUATION

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## Simplified CI Application Form

*Summary:* Staff is considering further simplification to the Tier 1 pathway application forms, as a replacement for the CA-GREET 2.0 Tier 1 Calculator.

*Rationale:*

- Facilitates pathway CI application, evaluation, and verification
- Eliminates intermediate steps to convert operational data to CA-GREET inputs
- Clearly indicates user-input fields subject to verification

***QUESTIONS:***

- Please review the draft form and provide feedback to identify raw, verifiable data that is metered or otherwise measured.

**Download the draft form at:**
https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/etoh_app.xlsm

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# Simplified Application Form (1)

Operational Data Summary for Feedstock Phase—Corn and Sorghum Inputs:

| Producer Operational Data Summary | | | Applicant: | ABC Company | | Feedstock Production Location: | U.S | |
|---|---|---|---|---|---|---|---|---|
| CI Restults | Corn Ethanol CI, g/MJ | | 73.59 | *(example CI)* | Sorghum Ethanol CI, g/MJ | | 74.15 | *(example CI)* |
| | Volume, gal | | 75,729,361 | | Volume, gal | | 15,839,199 | |
| Process: | Inputs for Corn and Sorghum and Co-products | | | | | | | |
| Data Years | Step 1) Select Feedstock Production Region | | | | | | | |
| | Select Regional Electricity Mix for Feedstock Production: | | | | | | 7-MROW Mix | |
| | Corn Transport | 50 | Miles by HD Truck | | Sorghum Transport | 50 | Miles by HD Truck | |
| | | 1,400 | Miles by Rail | | | 1,400 | Miles by Rail | |
| Monthly Data | Beginning Corn Inventory | Corn Used (calculated) | Corn Received | Ending Corn Inventory | Beginning Sorghum Inventory | Sorghum Used (calculated) | Sorghum Received | Ending Sorghum Inventory |
| Unit | Bushels | Bushels | Bushels | Bushels | Bushels | Bushels | Bushels | Bushels |
| Month 1 | 1,000,000 | 1,330,000 | 1,330,000 | 1,000,000 | | | | |
| Month 2 | 1,000,000 | 1,300,000 | 1,200,000 | 900,000 | | | | |
| Month 3 | 1,000,000 | 1,300,000 | 1,400,000 | 1,100,000 | | | | |
| Month 4 | 1,000,000 | 1,100,000 | 1,400,000 | 1,300,000 | 500,000 | 900,000 | 1,000,000 | 600,000 |
| Month 5 | 1,000,000 | 839,000 | 839,000 | 1,000,000 | 500,000 | 2,100,000 | 2,000,000 | 400,000 |
| Month 6 | 1,000,000 | 800,000 | 1,300,000 | 1,500,000 | 500,000 | 750,000 | 700,000 | 450,000 |
| Month 23 | 1,000,000 | 1,508,000 | 1,508,000 | 1,000,000 | | | | |
| ... | | | | | | | | |
| Month 24 | 1,000,000 | 1,608,000 | 1,508,000 | 900,000 | | | | |
| Total or Average | 24,000,000 | 31,698,930 | 32,235,000 | 24,536,070 | 3,000,000 | 6,630,000 | 6,900,000 | 3,270,000 |

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# Simplified Application Form (2)

Operational Data for Feedstock Phase—DGS Production:

| Dry DGS Produced (calculated) | Dry DGS Sales | Dry DGS Ending inventory | Moisture Content | Modified DGS Produced (calculated) | Modified DGS Sales | Modified DGS Ending Inventory | Moisture Content | Wet DGS Produced (calculated) | Wet DGS Sales | Wet DGS Ending Inventory | Moisture Content |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tons | Tons | Tons | % | Tons | Tons | Tons | % | Tons | Tons | Tons | % |
| 888 | 588 | 300 | 10% | 0 | 0 | 0 | 0% | 53,000 | 50,000 | 3,000 | 68% |
| 1,100 | 800 | 600 | 11% | 0 | 0 | 0 | 0% | 52,100 | 55,000 | 100 | 68% |
| 116 | 136 | 580 | 11% | 0 | 0 | 0 | 0% | 55,485 | 55,555 | 30 | 68% |
| 132 | 100 | 612 | 11% | 0 | 0 | 0 | 0% | 22,215 | 22,225 | 20 | 68% |
| 135 | 135 | 612 | 11% | 0 | 0 | 0 | 0% | 79,992 | 80,000 | 12 | 68% |
| 135 | 135 | 612 | 11% | 0 | 0 | 0 | 0% | 90,010 | 90,000 | 22 | 68% |
| 200 | 200 | 612 | 11% | 0 | 0 | 0 | 0% | 10,997 | 11,000 | 10 | 68% |
| 222 | 222 | 612 | 11% | 0 | 0 | 0 | 0% | 11,009 | 11,000 | 19 | 68% |
| 6,034 | 5,422 | 14,332 | 11% | 0 | 0 | 0 | 0% | 763,465 | 763,446 | 3,682 | 68% |

*Includes identical fields to enter syrup and corn oil co-product production, not shown.*

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# Simplified Application Form (3)

Operational Data for Fuel Phase—Ethanol Production:

| | Process: | Inputs for Ethanol Production | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Step 2) Select Region for Ethanol Production (Dry Mill) | | | | | | | | | |
| | Step 2) Select Region for Ethanol Production (Dry Mill) | | | | Select Regional Electricity Mix for Fuel Production: | | | | 3-CAMX Mix | |
| | | Ethanol Transport | 1,396 | By Rail | | Biomass Transport Distance | | | 80 | |
| | | | 100 | By HD Truck | | Biogas Transport Distance | | | 0 | |
| Monthly Data | Beginning Denatured Ethanol | Denatured Ethanol Sales | Ending Denatured Ethanol | Ethanol Produced (calculated) | NG Use from Invoices | Biomass Use from Invoices | Biogas Use from Invoices | Other Thermal Energy Use | Electricity from Utility Invoices | Other Electricity Sources |
| Unit | Gallons @ 60° F | Gallons @ 60° F | Gallons @ 60° F | Gallons @ 60° F | MMBtu, HHV | Dry Tons | MMBtu, HHV | MMBtu, HHV | kWh | kWh |
| Month 1 | 1,234,560 | 1,000,000 | 1,700,000 | 1,934,560 | 75,500 | 95 | 0 | | 1,600,000 | |
| Month 2 | 1,700,000 | 1,000,000 | 5,200,000 | 5,900,000 | 78,000 | 10 | 0 | | 1,500,000 | |
| Month 3 | 5,200,000 | 1,000,000 | 2,400,000 | 6,600,000 | 67,000 | 260 | 0 | | 1,500,000 | |
| Month 4 | 2,400,000 | 1,000,000 | 2,400,000 | 3,800,000 | 73,000 | 200 | 0 | | 1,500,000 | |
| Month 5 | 2,400,000 | 1,000,000 | 4,500,000 | 5,900,000 | 53,000 | 100 | 0 | | 1,500,000 | |
| Month 6 | 4,500,000 | 1,500,000 | 2,400,000 | 5,400,000 | 73,000 | 81 | 0 | | 1,500,000 | |
| Month 23 | 2,400,000 | 1,000,000 | 2,400,000 | 1,800,000 | 87,000 | 111 | 0 | | 1,500,000 | |
| ... | | | | | | | | | | |
| Month 24 | 2,400,000 | 1,000,000 | 2,400,000 | 3,800,000 | 80,000 | 127 | 0 | | 1,500,000 | |
| Total or Average | 60,634,560 | 30,866,000 | 61,800,000 | 71,568,560 | 1,821,539 | 2,674 | 0 | 0 | 36,100,000 | 0 |

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# Simplified Application Form Feedback requests

***QUESTIONS:***

- *Are appropriate units of measurement given for each data collection point?*
- *Do the input fields provided in the form align with the feedstock and co-product inventory tracking methods that facilities currently employ?*
- *Will there be comparable records that verifiers can check to confirm these amounts? Can the documentation sources referenced be clarified?*
- *What adjustments (unit conversions or adjustment to normalize climate variations) are made to metered or measured quantities? Are there variations in the types of meters used, meter location within the production stream, calibration requirements, or other potential sources of inconsistency across producers that staff should be aware of?*
- *Will the fields offered in this form accommodate the majority of starch ethanol production processes?*

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# Allocating Fuel Volumes to Multiple Feedstocks

*Summary:* A fuel producer must be able to unequivocally associate specific quantities of feedstock consumed with specific volumes of fuel. Staff is considering requiring producers to define their FPC allocation accounting methodology in their monitoring plan, and verifiers to check that the volumes reported in each quarter reflect feedstock consumption within that quarter.

*Rationale:*

- To minimize risk of credit adjustments at the conclusion of an entire verification period, we suggest that producers use the simplified data summary forms to track their feedstock consumption within each quarter and ensure accurate volumes are reported for each FPC.

***QUESTIONS:***

- *Are there challenges associated with assessing feedstock consumption and allocating to fuel volumes sold on a quarterly basis?*
- *Do stakeholders need additional guidance on allocation methodologies and recordkeeping to ensure compliance?*

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# Multiple Co-Product Pathways

*Summary:* Currently, most producers use a composite wet/dry/modified DGS CI score. Staff is considering whether to offer separate pathways for co-products. Potential requirements might include metering of drying energy and DGS throughput and maintaining detailed records to allow for verification of volumes associated with each pathway.

*Rationale:*

- Producers want flexibility to vary shares of co-products in response to changing market conditions without needing to adjust CI each year or risk violating approved CI.
- However, determining energy consumption associated with drying and verification of DGS sales may be data-intensive and time-consuming.

***QUESTIONS:***

- *How can we ensure that methods for accounting and reporting of the volumes associated with each drying level are accurate and verifiable?*

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Potential Non-Regulatory Changes for Enhanced Reporting, and Potential Regulatory Amendments to Reporting Requirements

# FUEL REPORTING

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## Reporting Standardized Volumes for Liquid Alternative Fuels

***Summary:***

- Fuel volumes reported in the LCFS should be adjusted to standard temperature conditions of 60°F.
- Staff has published a draft guidance on temperature adjustment methodology, consistent with RFS.

***Rationale:***

- Volume of ethanol and other liquid alternative fuels changes with the temperature at which they are recorded.
- Consistent reporting of fuel volumes across all reporting parties is necessary to ensure the accuracy of fuel data and credit calculation.

***QUESTIONS:***

- Please review the draft guidance posted and provide any feedback.

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Draft LCFS Regulatory Guidance 17-01 available at:
https://www.arb.ca.gov/fuels/lcfs/guidance/regguidance_17-01.pdf

# Reporting Exports of Ethanol and Fuel Blend Containing Ethanol

***Summary:*** If ethanol (neat or fuel blend) reported in the LCFS is subsequently exported then the exported amount of ethanol must be reported. If the blend percentage of the ethanol is not known in the exported fuel then we suggest the following default percentages:

- 10% denatured ethanol by volume in exported CaRFG
- 85% denatured ethanol by volume in exported E85 products.

***Rationale:***

- Reporting of exports is critical to ensure accurate accounting of credits and deficits in the program

***QUESTIONS:***

- *What are the challenges of accurately tracking blend percentages of ethanol in the fuel blends for the purpose of reporting exports?*
- *Please provide feedback on the suggested default ethanol blend percentages for the purpose of reporting exports.*

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# Quarterly Reconciliation with Counterparties in the LRT-CBTS

***Summary:*** Staff is considering placing automated holds on any credits related to unreconciled fuel transactions, allowing only the reconciled fuel transactions to generate credits.

***Rationale:***

- Eliminate the need for third-party verification of fuel transactions reported downstream of initial regulated party.
- Limit the cost and scope of verification program while ensuring high quality of credits.

***QUESTIONS:***

- *Staff is requesting feedback on implementing automated credit holds for unreconciled data.*
- *Are there any suggestions for a general rule to resolve credit disputes resulting from unreconciled fuel transactions?*
- *Should either the upstream or downstream parties' report be given greater weight?*

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# LRT-CBTS System Check for Total Amount (TA) of Fuel for each FPC

***Summary:***

- Currently, the system checks for non-negative value of total obligated amounts (TOA check) but does not check non-obligated fuel amounts.
- A Total Amount (TA) system check will prevent over-drafting of fuel amounts to ensure a non-negative fuel amount balance is maintained in a LRT-CBTS account.
- Summed across all reporting periods starting 2016.
- Applicable for all FPCs established pursuant to the 2015 readoption of the LCFS regulation.

***Rationale:***

- This will prevent over-drafting of fuel amounts to ensure a non-negative balance is maintained in a LRT-CBTS account
- Non-negative fuel balance is critical for proper compliance and accounting of credits and deficits in the program



# Fuel Obligation Transfer Period

**Obligation** for liquid alternative fuel refers to the credits associated with the fuel, or the ability to generate credits, and the requirement to report these volumes. Obligation can be transferred downstream along with ownership of the fuel.

***Summary:*** Staff is considering proposing a fuel obligation transfer period of two quarters.

***Rationale:***

- Retaining ownership of obligated fuel when the annual CI standard changes also changes the number of credits or deficits associated with the fuel.
- To avoid such situations and ensure the accuracy of credits and deficits in the program, fuel obligation transfer period would ideally be limited to one reporting quarter; however, staff is suggesting fuel obligation transfer period of two reporting quarters to accommodate the industry practices

***QUESTIONS:***

- *Are there alternatives to fuel obligation transfer period that should be considered?*
- *Would there be any challenges with selecting two quarters as the duration?*

Verification Program Overview

Considerations for Starch-Derived Ethanol

# VERIFICATION

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# Verification of Tier 1 Starch-Based Ethanol: Summary & Rationale

*Summary:* Addition of mandatory third-party verification of program aspects including, but not limited to:

- Fuel pathway carbon intensities
- Reported fuel quantities
- Chain-of-custody information

*Rationale:* Further ensure integrity in LCFS credit market through verification of GHG reduction claims and improve consistency with international standards of assurance

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# Third-Party Verification – Guiding Principles

① ARB retention of sole authority over the LCFS program, including verification requirements, as bestowed through the State's legislative and regulatory process;

② Continual improvement in the detection, prevention, and correction of errors or fraud;

③ Identification and implementation of cost reducing strategies, while maintaining verification rigor;

④ Policy consistency with other ARB verification programs; and

⑤ Consideration of the unique attributes of fuel carbon intensities and fuels marketing structure.

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# Verification Program Considerations

- Validate the initial 24 months of operational data needed for fuel pathway code (FPC) application approval.
- Verify, on an ongoing basis, that the average CI over the compliance period (calendar year) does not exceed the certified value (by reviewing operational data and transactions at the production facility).
- Verify, on an ongoing basis (including using mass balance and yield assessment), the total ethanol production volumes and the volumes of ethanol sold from the production facility to each counterparty.
- Verify ethanol volumes claimed as imported to California or produced for use in California to ensure proper accounting for reported fuel volumes by FPC.
- Verify exported volumes of LCFS ethanol are accounted for correctly.

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# Verification Responsibilities

- All Producers
  - Initial CI Validation
  - Ongoing CI Verification
- Producer or Importer*
  - Ongoing Verification of reported fuel volumes in LRT-CBTS
- Exporter
  - Ongoing Verification of exported fuel volumes in LRT-CBTS

** Importer is the Initial Regulated Party when the producer does not opt in and is the first to report in LRT-CBTS. Intermediate entities may choose to opt in.*

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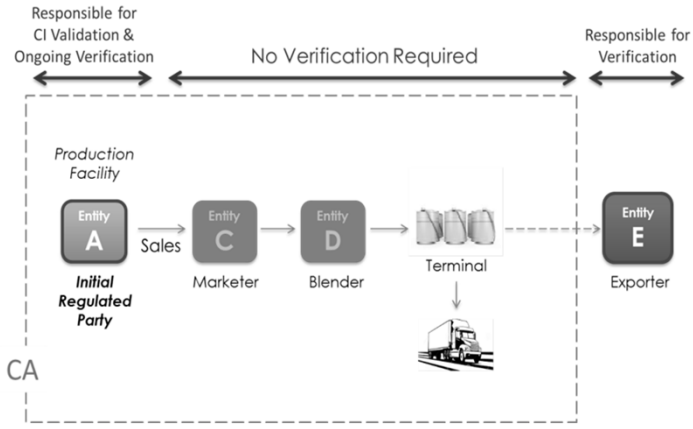
# Figure 1a. California Producer

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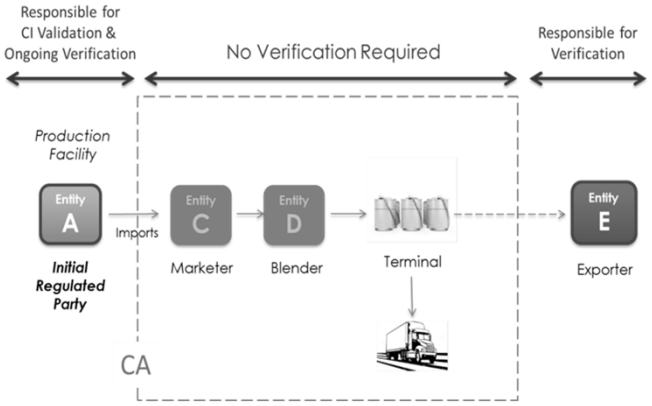
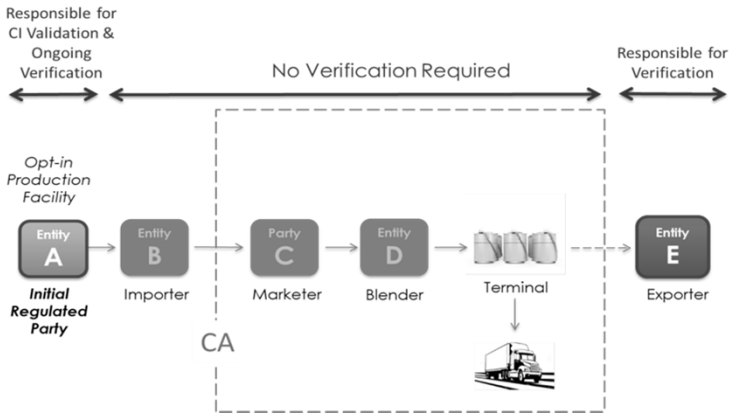
# Figure 1b. Out-Of-State Producer Who is Regulated as an Importer




23

# Figure 1c. Out-Of-State Producer Who Decides to Opt-In

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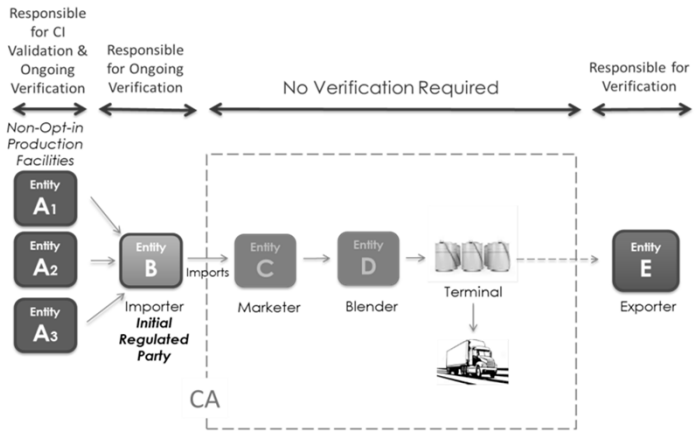
# Figure 2. Importer When Out-Of-State Producer Does Not Opt-In

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# Third-Party Verification Points – Initial CI Validation

- Validate operational data submitted for the initial CI determination
- Confirm facility geographic location and physical configuration appropriate for starch ethanol production
- Confirm that process flow diagram as described in pathway application accurately reflects combustion equipment and facility configuration, including meter locations, recycling or return lines, storage tank volumes
- Review recordkeeping and data management practices

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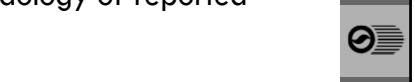
# Third-Party Verification Points – Ongoing Verification of CI

- Verify operational data and supporting records:
  - feedstock inputs (meter records and feedstock purchase invoices)
  - process energy inputs (utility invoices, meter records)
  - ethanol production and sales volumes, adjusted to 60°F (meter records, contracts, and sales invoices)
  - co-product quantities and moisture content(meter records, sales invoices)
  - full mass balance and yield analysis
- Verify accuracy of allocation methodology of reported fuel volumes to FPC(s)



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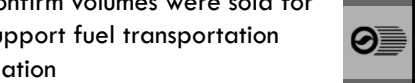
# Third-Party Verification Points – Ongoing Verification of LRT-CBTS Reports

Verify reported fuel volumes are accurate by reviewing:

- Product Transfer Documents (PTD) to ensure accurate accounting of fuel volumes per FPC(s) sold for use as a transportation fuel in California and confirm physical delivery
- Sales contract terms and PTDs to confirm all California fuel sales are properly labeled by FPC and as sold with or without obligation, using ARB-approved wording
- Sales invoices and payment records to confirm volumes were sold for transportation use in California and to support fuel transportation distances and modes used in CI determination



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# Verification Questions

1. Staff is seeking feedback on holding the following entities responsible for verification:
   - All producers,
   - Opt-in intermediate entities,
   - Importers, and
   - Exporters.

2. Staff is seeking feedback on the potential third-party verification points identified in Tables 3 and 4 of the Ethanol Discussion Paper.

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# Verification Questions

3. To inform site visit frequency (quarterly, semiannual, annual, triennial), staff is seeking stakeholder feedback regarding the frequency with which activities most likely to impact compliance can potentially change.
   - Are there critical activities that may change frequently, versus activities that are unlikely to change during the course of normal ethanol production and delivery?

4. Is remote monitoring by a third-party verification body sufficient to detect potential fraud in the supply chain and thereby substitute for more frequent site visits at the production facility?

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# Verification Questions

5. To inform verification period (quarterly, annual, triennial) for starch-derived ethanol verification, staff is seeking stakeholder feedback regarding the proposal discussed today—*for all producers*:

   - CI conformance over the prior calendar year verified once a year—*verifier would use the "Simplified CI Application Data Summary Form" with verified operational data for the past calendar year to calculate CIs*

     $$CI_{\text{verifier calculated}} \leq CI_{\text{certified}}$$

   - Produced fuel volume conformance over each quarter in the prior calendar year verified once a year—*verifier would use the "Simplified CI Application Data Summary Form" 4 times (with verified feed and fuel volumes in each quarter, using other operational data from certified CI)*

     **Produced Fuel Vol. ($FPC_a$) =**

     **Total Produced Fuel Vol. x (Feedstock Used$_a$ / Feedstock Used$_{total}$ )**

     **Produced Fuel Vol. ($FPC_a$) ≥ SUM {Sold Fuel Vol. ($FPC_a$) per business partner}**

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# Verification Questions

5. (continued)

   To inform verification period (quarterly, annual, triennial) for starch-derived ethanol verification, staff is seeking stakeholder feedback regarding the proposal discussed today— *for the case of imports from production facilities that choose not to opt in, verification is also required to reconcile between the producer and importer*:

   - Imported fuel volume conformance over each quarter in the prior calendar year verified once a year—verifier would use verified purchases, sales, chain-of-custody to producer and physical delivery to California. Per FPC:

     **Imported Fuel Vol. ≤ Purchased Fuel Vol.**

     **Sold Fuel Vol. ≤ Imported Fuel Vol.**

   - Producer's verifier would be given access to associated imported fuel volumes to compare to production and sales data. Per FPC,

     **Produced Fuel Vol. ≥ SUM {Imported Fuel Vol. per importer}**

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# Third-Party Verification Points – Ongoing Verification of LRT-CBTS Reports for Exporters

Verify reported fuel volumes are accurate by reviewing:

- Methodology for allocation of exported fuel volumes to FPC(s)
- PTDs to ensure accurate accounting of fuel volumes per FPC(s) reported upstream for transportation use in California
- Purchase and sales invoices and payment records to confirm volumes sold for use outside California and for transportation use in California
- Tax records submitted to the Board of Equalization by exporter

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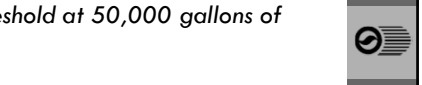
# Exemption Considerations

- Staff is considering exempting exporters of low fuel volumes, for example less than 50,000 gallons of total ethanol per year for each exporter, from the third-party verification requirement.
- Staff considers exports reported by entities already subject to verification to be within the scope of the mass balance review.

***QUESTIONS:***

- *Staff is seeking feedback on the concept of including an exemption threshold for third-party verification to exporter of smaller volumes of exported ethanol.*
- *Staff is seeking feedback on setting the threshold at 50,000 gallons of exported ethanol.*



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# THANK YOU!

Feedback should be sent to

LCFSworkshop@arb.ca.gov

by February 28th, 2017

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