

Reporting and Verification Guidance for Natural Gas Fractionators

1. Introduction

This document provides guidance for natural gas liquid (NGL) fractionators using Cal e-GGRT to report fuel supplier emissions and product data pursuant to the Regulation for Mandatory Reporting of Greenhouse Gas Emissions (title 17, California Code of Regulations, section 95100-95158) (MRR), for 2013 data reported in 2014, and for data reported in future years. This guidance document does not, and cannot modify any legal requirement of MRR.

Section 95122 of MRR contains requirements for calculating and reporting GHG emissions that result from complete combustion of NGLs and liquefied petroleum gas (LPG) products produced at natural gas fractionation facilities. All NGL fractionators meeting the applicability requirements for reporting pursuant to section 95101(c) of MRR must report emissions from the supplied fuel pursuant to section 95122 of MRR. In addition, NGL fractionators are required to report covered product data pursuant to section 95156(c) of MRR. Covered product data are reported in addition to emissions data and are used for allowance allocation purposes in the Cap-and-Trade Program.

It should be noted that for the purposes of allowance allocation under the Cap-and-Trade Program, the product data reporting requirements in this guidance document also apply to natural gas processing facilities and onshore petroleum and natural gas production facilities with a natural gas processing plant that processes less than 25 million standard cubic feet per day (MMscf), pursuant to MRR section 95156(c).

2. Reporting Guidance for NGL Fractionators

This section provides guidance for NGL fractionators for reporting fuel supplier emissions from NGLs and LPGs pursuant to the requirements in section 95122 of MRR, as well as reporting NGL covered product data pursuant to section 95156(c). In the California Electronic Greenhouse Gas Reporting Tool (Cal e-GGRT), NGL and LPG emissions data is reported in Subpart NN tool, and the covered product data is reported in Subpart W of the reporting tool.

2.1. Reporting GHG Emissions Data in Subpart NN of Cal e-GGRT

Section 95101(c)(8) of MRR requires that NGL fractionators report all emissions required by MRR regardless of quantity. However, stationary combustion emissions reported pursuant to section 95115 and process and fugitive emissions reported pursuant to sections 95150 through 95158 are subject to separate reporting and verification thresholds, as required in section 95101(b).

Section 95122(a)(1) of the MRR requires NGL fractionators to report two sets of fuel supplier emissions data in subpart NN of Cal e-GGRT, as follows:

1. NGL emissions data as specified in the referenced section of the U.S. Environmental Protection Agency (USEPA) Mandatory Reporting Rule 40 CFR Part 98.402(a) (Subpart NN), which captures emissions associated with the downstream combustion of the following NGL products produced and supplied to end-users (irrespective of the final destination of the product): propane, normal butane, isobutane, ethane, and pentanes plus. Data reported pursuant to section of 40 CFR Part 98.402(a) Subpart NN, is equivalent to the data reported to the US EPA for these emissions. **These emissions are considered “total emissions” for Subpart NN.**
2. Emissions from all LPG gas produced and sold or delivered to others, with the exception of products for which a destination outside California can be demonstrated. The LPG products required to be reported per 95122(a)(1) are a subset of the products reported under section 40 CFR Part 98 Subpart NN requirements. **These emissions are considered “covered emissions” for cap-and-trade compliance obligation purposes. NGL fractionators will have a compliance obligation for the emissions from the combustion or oxidation of LPG products supplied starting in 2015 for the second compliance period of the Cap-and-Trade Program.**

Table 1: NGL Products and LPG Constituents

NGLs Required per 40 CFR 98.402(a)	LPG Constituents
<i>Ethane (LPG and non-LPG)</i>	<i>LPG – Ethane</i>
<i>Propane (LPG and non-LPG)</i>	<i>LPG – Ethylene</i>
<i>Butane (LPG and non-LPG)</i>	<i>LPG – Propane</i>
<i>Isobutane (LPG and non-LPG)</i>	<i>LPG – Propylene</i>
<i>Pentanes Plus (LPG and non-LPG)</i>	<i>LPG – Butane</i>
<i>Note: includes natural gasoline and pentanes plus</i>	<i>LPG – Butylene</i>
	<i>LPG – Isobutane</i>
	<i>LPG – Isobutylene</i>
	<i>LPG - Pentanes Plus</i>

2.1.1. Determining NGL and LPG Reporting Requirements

Under MRR, LPG, commonly referred to as “propane,” is a commercial fuel that meets the specifications in section 95102(a). NGL fractionators must report the amounts of

the components of LPG fuel, as well as of the total NGLs (LPG and non-LPG) produced. LPG is typically used as a fuel for purposes such as heating, transportation, and BBQ grills. LPG includes products sold as LPG (grades HD-5 and HD-10), as well as other component mixtures which meet the definition of LPG. While total NGLs are reported, only emissions associated with the LPG components are considered covered emissions for cap-and-trade compliance obligation purposes, and are assessed for material misstatement during verification.

2.1.2. Covered Emissions Calculation

For NGL fractionators, covered emissions are those associated with downstream combustion of LPG supplied in California. Covered emissions are therefore equal to the sum of the CO₂, CH₄, and N₂O emissions from all LPG components that are produced and delivered, unless destination outside of California can be demonstrated. Verifiers must evaluate the covered emissions for material misstatement, which means that verifiers will closely review the measurement, data management, and quality control processes used to calculate the volume of LPG and the calculations used to determine total emissions to ensure they meet the accuracy requirements in section 95103(k) of MRR.

2.2. Reporting NGL Production Volumes as Covered Product Data in Subpart W

In addition to reporting emissions data in Subpart NN of Cal e-GGRT, NGL fractionators are also required to report product data pursuant to section 95156(c) in Subpart W of Cal e-GGRT. Product data reporting requirements in section 95156(c) also apply to natural gas processing facilities and onshore petroleum and natural gas production facilities with a natural gas processing plant that processes less than 25 MMscf per day, and this data should also be reported in Subpart W of Cal e-GGRT. The volume of NGLs produced is considered “covered product data”¹ and used to for allowance allocation purposes in the Cap-and-Trade Program. In contrast to emissions data, all NGL products (LPG and non-LPG) are used in this calculation, and the sum of these values is what the verifier will evaluate for material misstatement. The covered product data reported in Subpart W of the Cal e-GGRT reporting tool should reflect the NGLs produced at the facility (as opposed to produced *and delivered* as reported in Subpart NN). Therefore, these data should typically be largely consistent with the volumes reported under Subpart NN unless there is significant onsite inventory storage from year to year. Note that, when reporting covered product data, LPG is reported as individual constituents and a total LPG sum, and natural gasoline is added as a covered product.

¹ “‘Covered product data’ means all product data included in the allocation of allowances under sections 95870, 95890, and 95891 of the cap-and-trade regulation, regardless of whether the cap-and-trade regulation imposes a compliance obligation for the data year.” (section 95102(a) of MRR).

NGL fractionators report the amount of NGLs produced in 2013 in Cal e-GGRT using the spreadsheet "[Petroleum and Natural Gas Systems \(Subarticle 5\) Emissions Reporting Tool](#)." After the data has been entered into this spreadsheet, the data is exported to Cal e-GGRT as "XML" data, and will display in the emissions data report.

3. Reporting Information in Cal e-GGRT

ARB implemented several changes to Cal e-GGRT beginning with 2013 data reported in 2014 to better align reporting with the requirements of section 95122 of MRR and the relevant reporting sections for NGL fractionators in section 40 CFR Part 98 Subpart NN. NGL fractionators should understand these changes because they may require that you enter data differently from previous years.

The NGL Fractionator section of the Subpart NN module of Cal e-GGRT begins with these instructions:

OVERVIEW OF SUBPART REPORTING REQUIREMENTS FOR NATURAL GAS LIQUID (NGL) FRACTIONATORS

Section 95122 (a)(1) requires NGL Fractionators to report CO₂ emissions, as specified in 40 CFR §98.402(a), that would result from the complete combustion or oxidation of the total annual quantity of ethane, propane, butane, isobutane, or pentanes plus that is produced and supplied to others. In addition to this information NGL fractionators that supply Liquefied Petroleum Gas products in California must report the total GHG emissions that would result from the complete combustion or oxidation of all LPG products produced and supplied, unless destination outside of California can be demonstrated.

NGL fractionators report both total NGLs (LPG and non-LPG) received and supplied, and total LPG components produced and delivered *unless destination outside of California can be demonstrated* in the Subpart NN module of Cal e-GGRT. The two categories are described hereafter as "NGLs" and "LPG." As shown in Figure 1, reporters input NGLs in Cal e-GGRT in the top section of the reporting table as: ethane, propane, butane, isobutane, and pentanes plus. Reporters input LPG fuel components in the bottom section of the reporting table (below the red line indicated in Figure 1), by component.

Figure 1: Choosing NGL and LPG products in Cal e-GRRT

Supplier Type* Natural gas liquid fractionator [CHANGE](#)

GHG SUMMARY

Products ^{1,3}	CO ₂ (metric tons)	CH ₄ (metric tons) ⁴	CO ₂ e of CH ₄ (metric tons) ⁴	N ₂ O (metric tons) ⁴	CO ₂ e of N ₂ O (metric tons) ⁴	Status ²	
<input checked="" type="checkbox"/> Ethane (LPG and non-LPG)						Incomplete	OPEN
<input checked="" type="checkbox"/> Propane (LPG and non-LPG)						Incomplete	OPEN
<input checked="" type="checkbox"/> Butane (LPG and non-LPG)						Incomplete	OPEN
<input checked="" type="checkbox"/> Isobutane (LPG and non-LPG)						Incomplete	OPEN
<input checked="" type="checkbox"/> Pentanes Plus (LPG and non-LPG)						Incomplete	OPEN
<input type="checkbox"/> LPG Ethane							
<input type="checkbox"/> LPG Ethylene							
<input checked="" type="checkbox"/> LPG Propane						Incomplete	OPEN
<input checked="" type="checkbox"/> LPG Propylene						Incomplete	OPEN
<input checked="" type="checkbox"/> LPG Butane						Incomplete	OPEN
<input type="checkbox"/> LPG Butylene							
<input type="checkbox"/> LPG Isobutane							
<input type="checkbox"/> LPG Isobutylene							
<input type="checkbox"/> LPG Pentanes Plus							
Total	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete		

MISCELLANEOUS INFORMATION FOR NGL FRACTIONATORS

Natural Gas Received (Mscf)	Y-Grade Bulk NGLs Received (bbl)	Propane Odorized and Delivered (bbl)	
			OPEN

[← Facility Overview](#)

3.1. Entering NGL and LPG data

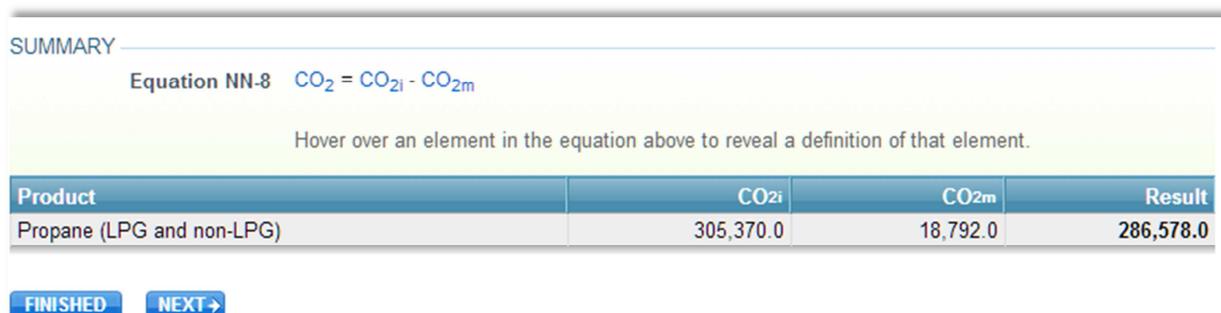
After selecting the appropriate NGLs and LPG data components in the reporting table, the reporter enters the data for each component separately by clicking on the “Open” button and following the instructions.

3.2. Entering NGL Data

For NGL products, the reporter enters both LPG and non-LPG products into the tool and the emissions are calculated by the tool using equation NN-8 of 40 CFR Part 98 Subpart NN (see Figure 2). The tool calculates total CO₂ for each NGL component by subtracting the emissions from the volume of product received from upstream producers (CO_{2m}) from the emissions from the total product supplied by the reporter (CO_{2i}). The

net difference is equal to the total emissions from the product produced and delivered by the fractionator. Note that when entering volumes “received,” the reporter should only enter products that were received from upstream suppliers in the form of fractionated “purity” products or component mixtures. Reporters do **not** report bulk y-grade mixtures as product “received.”

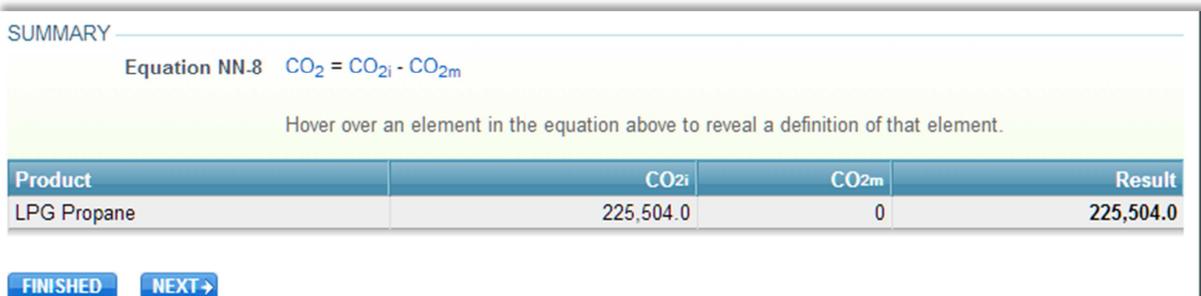
Figure 2: NGL calculation



3.3. LPG Data:

The NGL data entered in the top section, as shown in Figure 1, must include all NGLs produced and delivered, including both LPG and non-LPG products. In the bottom section of Figure 1, the reporter only reports the LPG products that are delivered in California. In other words, the primary LPG product components delivered in California are reported in the NGL section (aggregated with other non-LPG products) and also in the bottom section for LPG products. When entering LPG component data, note that the tool does not require the reporter to enter the data as “supplied” minus “received.” Instead, only one field is available for reporting the total volume of the LPG component that is produced and supplied in California (see Figure 3). This field is used to calculate the (CO_{2i}) parameter in equation NN-8. The (CO_{2m}) parameter is set to zero for LPG products.

Figure 3: LPG calculation



3.4. Total Emissions and Covered Emissions:

Although volume data for LPG products are entered in the total NGL section and in the LPG section, the tool will not double count the emissions from the LPG products. The "Total Emissions" calculated by the tool for Subpart NN is equal to the sum of the NGL products only. The summed emissions from the LPG components are equal to the "Covered Emissions" from supplied LPG. The covered emissions total is not currently displayed in Cal e-GGRT, but will be calculated by ARB as described in this paragraph.

3.5. Reporting Example for NGL Fractionators

The following provides a reporting example intended to highlight some of the important Cal e-GGRT changes discussed above for NGL fractionators. The following examples clarify what data are input into the tool and how the data are used.

In 2013, an NGL fractionator delivers the following products:

- 2,000 barrels (bbl) of bulk ethane
- 6,000 bbls of isobutane
- 5,000 bbls of natural gasoline
- 100,000 bbls of HD-5 and HD-10 LPG, consisting of:
 - 90% propane
 - 5% butane
 - 5% propylene

In 2013, the NGL fractionator receives the following products from upstream fractionators:

- 1,000 bbls of bulk ethane
- 3,000 bbls of bulk butane

Additional Information: The NGL fractionator can demonstrate that 20 percent of the LPG was delivered outside of California.

Step 1: Reporting NGL quantities

First, the NGL fractionator must enter the volume data for all NGL products (LPG and non-LPG) produced and delivered into Cal e-GGRT to determine the total emissions from its NGL products. Cal e-GGRT will automatically calculate the total CO₂e emissions from the NGL products supplied.

For example, the Cal e-GGRT screenshots below (Figures 4, 5, and 6) show the data entry windows that the NGL fractionator will use to report product supplied and received in Cal e-GGRT for butane (LPG and non-LPG). Note that the NGL fractionator supplied 100,000 bbls of LPG product containing 5 percent butane, which means that the NGL fractionator reports 5,000 bbls of butane as delivered product. The 5,000 bbls of butane

would be reported under the NGL “supplied” data field for the Butane (LPG and non-LPG) product (see Figure 4).

Figure 4: Entering NGL product “supplied”

Section 95122 (Subpart NN): Suppliers of Natural Gas and Natural Gas Liquids (2012)
Subpart Overview » Butane (LPG and non-LPG) » Eq. NN-2

CO₂ QUANTITY CALCULATION
NGL fractionators that supply Liquefied Petroleum Gas products in California must report the total GHG emissions that would result from the complete combustion or oxidation of all LPG products produced and supplied, unless destination outside of California can be demonstrated.

- Equation Summary (NN-8)
- CO₂: (NN-2) Potential CO₂ quantities from product supplied to all end users
- Fuel: Annual Volume of Butane (LPG and non-LPG) Supplied to all end users**
- EF: Emissions Factor
- CO_{2m}: (NN-7) CO₂ associated with product received from other fractionators

TOTAL ANNUAL VOLUME OF PRODUCT SUPPLIED TO ALL USERS

Total annual volume of product supplied	<input type="text" value="5000"/> (bbl)
Days in reporting year for which substitute data procedures were used	<input type="text" value="0"/> (days)
Industry standard used to measure the volume	<input type="text" value="ASTM standard"/>

Next, the NGL fractionator received 3,000 bbls of butane from upstream suppliers. The 3,000 bbls of received butane would be reported under the NGL “received” data field (see Figure 5).

Figure 5: Entering NGL product “received”

Section 95122 (Subpart NN): Suppliers of Natural Gas and Natural Gas Liquids (2012)
[Subpart Overview](#) » [Butane \(LPG and non-LPG\)](#) » [NGL Product Received](#)

CO₂ QUANTITY CALCULATION
 NGL fractionators that supply Liquefied Petroleum Gas products in California must report the total GHG emissions that would result from the complete combustion or oxidation of all LPG products produced and supplied, unless destination outside of California can be demonstrated.

- ▷ [Equation Summary \(NN-8\)](#)
 - ▷ [CO_{2i}: \(NN-2\) Potential CO₂ quantities from product supplied to all end users](#)
 - ▷ [CO_{2m}: \(NN-7\) CO₂ associated with product received from other fractionators](#)
 - ▷ **Fuel: Annual Volume of Butane (LPG and non-LPG) Received**
 - ▷ [EF: Emissions Factor](#)

TOTAL ANNUAL VOLUME OF NGL PRODUCT RECEIVED

Total annual volume of NGL product received (bbl)

Days in reporting year for which substitute data procedures were used (days)

[←BACK](#) [NEXT→](#)

Finally, the total emissions for the product are calculated (see Figure 6), by subtracting CO_{2m} from CO_{2i} (i.e. supplied minus received).

Figure 6: CO₂ emissions from Butane (supplied minus received)

SUMMARY

Equation NN-8: $CO_2 = CO_{2i} - CO_{2m}$

Hover over an element in the equation above to reveal a definition of that element.

Product	CO _{2i}	CO _{2m}	Result
Butane (LPG and non-LPG)	1,380.5	828.3	552.2

[FINISHED](#) [NEXT→](#)

Step 2: Entering LPG components

After the NGL fractionator enters all NGL (LPG and non-LPG) products into Cal e-GGRT, the NGL fractionator enters the LPG product components. For each LPG component, there is only one data entry field under the (CO_{2i}) heading where the NGL fractionator must enter the total volume of the product that is produced and supplied *in California*. This volume must be calculated by the NGL fractionator outside of the tool and entered into the “Total annual volume of product” field in the tool (see Figure 7 below). To calculate this value for a component of LPG, the NGL fractionator must multiply the volume of the LPG component “produced and supplied” by the fraction of LPG product supplied *in California*. For components where some of the product is

received from upstream suppliers, the NGL fractionator would calculate the volume of the LPG component “produced and supplied” as (volume supplied – volume received), similar to how the total NGL value is calculated. If the LPG product component is solely produced on-site, the volume of the LPG component “produced and supplied” value would be equal to the volume supplied.

For the example, the Cal e-GGRT screenshot below (Figures 7) shows the data entry window the NGL fractionator uses to report the butane component of the LPG products.

The total volume entered into the tool is equal to the volume of LPG butane produced and supplied multiplied by the fraction of the LPG product delivered in California according to the equation below:

“Total annual volume of product supplied” = ((100,000 bbls x 5%) – 3,000 bbls) x 0.8 = (5,000 bbls – 3,000 bbls) x 0.8 = 2,000 bbls x 0.8 = **1,600 bbls.**

Figure 7: Entering LPG product “produced and supplied in California”

Section 95122 (Subpart NN): Suppliers of Natural Gas and Natural Gas Liquids (2012)
Subpart Overview » LPG Butane » Eq. NN-2

CO₂ QUANTITY CALCULATION
NGL fractionators that supply Liquefied Petroleum Gas products in California must report the total GHG emissions that would result from the complete combustion or oxidation of all LPG products produced and supplied, unless destination outside of California can be demonstrated.

- ▷ Equation Summary (NN-8)
- ▷ CO₂: (NN-2) Potential CO₂ quantities from product supplied to all end users
- ▶ **Fuel: Annual Volume of LPG Butane Supplied to all end users**
- ▷ EF: Emissions Factor

TOTAL ANNUAL VOLUME OF PRODUCT SUPPLIED TO ALL USERS

Total annual volume of product supplied	<input type="text" value="1600"/> (bbl)
Days in reporting year for which substitute data procedures were used	<input type="text" value="0"/> (days)
Industry standard used to measure the volume	<input type="text" value="ASTM standard"/>

Step 3: Sum of NGL data

After entering all LPG data, the total emissions are equal to the sum of the NGL (LPG and non-LPG) data only. Figure 8 below shows how the values for NGLs and LPGs are summed in the Cal e-GGRT reporting table. **Note:** Natural gasoline is reported as pentanes plus.

Figure 8: Summary of NGL and LPG in Cal e-GGRT

GHG SUMMARY								
	Products ^{1,3}	CO ₂ (metric tons)	CH ₄ (metric tons) ⁴	CO ₂ e of CH ₄ (metric tons) ⁴	N ₂ O (metric tons) ⁴	CO ₂ e of N ₂ O (metric tons) ⁴	Status ²	
<input checked="" type="checkbox"/>	Ethane (LPG and non-LPG)	254.0	0.01	0.3	0.002	0.7	Complete	OPEN
<input checked="" type="checkbox"/>	Propane (LPG and non-LPG)	21,141.0	1.03	21.7	0.206	64.0	Complete	OPEN
<input checked="" type="checkbox"/>	Butane (LPG and non-LPG)	552.0	0.03	0.5	0.005	1.6	Complete	OPEN
<input checked="" type="checkbox"/>	Isobutane (LPG and non-LPG)	1,593.0	0.07	1.5	0.015	4.5	Complete	OPEN
<input checked="" type="checkbox"/>	Pentanes Plus (LPG and non-LPG)	1,618.0	0.07	1.5	0.014	4.3	Complete	OPEN
<input type="checkbox"/>	LPG Ethane							
<input type="checkbox"/>	LPG Ethylene							
<input checked="" type="checkbox"/>	LPG Propane	16,913.0	0.83	17.3	0.165	51.2	Complete	OPEN
<input checked="" type="checkbox"/>	LPG Propylene	1,008.0	0.05	1.0	0.009	2.8	Complete	OPEN
<input checked="" type="checkbox"/>	LPG Butane	442.0	0.02	0.4	0.004	1.3	Complete	OPEN
<input type="checkbox"/>	LPG Butylene							
<input type="checkbox"/>	LPG Isobutane							
<input type="checkbox"/>	LPG Isobutylene							
<input type="checkbox"/>	LPG Pentanes Plus							
	Total	25,158.0	1.21	25.45	0.242	75.151		

The NGL fractionator's total emissions are equal to $(25,158 + 25.45 + 75.15) =$ **25,258.6 MTCO₂e**, as calculated by Cal e-GGRT.

The NGL fractionator's covered emissions for this example would be equal to the sum total of all LPG component emissions, which is equal to 18,437 MTCO₂e. This value is not currently displayed in Cal e-GGRT.

Step 4: Covered Product Data Reporting Cal e-GGRT

As described in section 2.3, total covered product data for NGL fractionators includes all reported production of NGLs (LPG and non-LPG). NGL fractionators report products pursuant to section 95156(c) under Subpart W of Cal e-GGRT. Figure 9 below shows how the NGL products are displayed in the Subpart W reporting spreadsheet.

Figure 9: NGL product data entered in Subpart W

	A	B	C	D
1	Natural Gas Fractionating or Processing Facility - Additional Data Reporting			
2				
3	Facility Name			
4				
5				
6	Source Category (covered product data)	Barrels corrected to 60 degrees fahrenheit		
7	Total	109,000.0		
8	Ethane	1000.0		
9	Ethylene			
10	Propane			
11	Propylene			
12	Butane			
13	Butylene			
14	Isobutane	6000.0		
15	Isobutylene			
16	Pentanes plus			
17	Natural Gasoline	5000.0		
18	Liquified Petroleum Gas	97000.0		
19	Bulk natural gas liquids not included in the preceding list			
20				
21				
22				

Using ethane as an example, the NGL fractionator's total volume reported in the subpart W reporting spreadsheet must be equal to the total ethane produced by the facility during the reporting year. For the reporting scenario described in section 3.2, the total ethane produced would be equal to the total ethane supplied minus total ethane received from upstream: (2,000 bbls supplied - 1,000 bbls received) = **1000 bbls** produced. In this example, the total ethane produced would be the same volume as the ethane "produced and supplied" that is reported in Subpart NN of the tool. If there was inventory storage onsite, then the volume produced would have to be adjusted to account for the carry-over of product in the inventory storage system from year to year in order to reflect the actual volume of ethane produced in the reporting year. Regardless of the approach taken to quantity the volume, the reporter must ensure that only the volume of NGL product produced in the reporting year is reported as product data in Subpart W.

For reporting LPG, fractionators must report the aggregate volume of LPG rather than reporting the product by component as is reported in subpart NN of the tool. For this example (shown in Figure 9), the reported volume for LPG of 97,000 bbls is determined by summing the LPG produced for each component: 90,000 bbls of propane + 5,000 bbls propylene + 2000 bbls of butane = 97,000 bbls of LPG.

Total covered product data for the NGL fractionator equals **109,000 bbls**. This is the value that the verifier will evaluate for material misstatement.