To: Public Utilities Commission of Ohio
RE: Staff Interrogatories – Initial Set: Case No. 14-0432-EL-REN, Verso Quinnesec Mill-TG2

Please find below the Verso Quinnesec LLC response to the Staff Interrogatories – Initial Set. Answers are indicated in bold type.

The information requested in Question 5 will be provided as a separate document.

Question 1:

A. In Section K of the application, you indicated that you are currently registered with an attribute tracking system. Please identify the tracking system with which you are currently registered.
   Answer 1A: **MIRECS**

B. Further in Section K of the application, you indicate that you are either currently registered or intend to register in GATS as the tracking system for the Verso Quinnesec Mill-TG2. Is this correct?
   Answer 1B: **Yes**

Question 2:

A. In Section L of the application, you have indicated that the facility is certified in Michigan under Michigan Renewable Energy Certification System (MIRECS). Is this correct?
   Answer 2A: **Yes**

B. Please note: The Public Utilities Commission of Ohio recognizes two tracking systems for Ohio eligible renewable generation resources: GATS (Generation Attribute Tracking System) and M-RETS (Midwest Renewable Energy Tracking System), but not MIRECS. In addition, a facility can only be registered in one tracking system. Please confirm which tracking system will be used by the facility.

   Answer 2B: **It is our intention, once approved, to withdraw registration in MIRECS and register the generating facility in GATS.**

Question 3. What is the placed in service date of each of the three boilers?

Answer 3:
The year each boiler was originally placed in service is as follows:
Package Boiler: 1990
Recover Boiler: 1985

Waste Fuel Boiler: 1985

Question 4. Did the two biomass boilers use biomass fuel prior to the upgrades during 2010 and 2011?

Answer 4: **Yes both boilers utilized biomass fuels prior to the upgrades. The biomass utilization capacity of both boilers was increased.**

Question 5. Please resubmit p. 13 which is not legible.

The document below is a duplicate of the information on p. 13 of the application.

Renewable Energy Allocation Calculation Method

The calculation method described below uses January 2012 operating data in examples.

The steam produced by the boilers feeds a common steam header. Fuel consumption and subsequent steam production in the boilers is determined by the following process:

- Using PI System information, the total Natural Gas purchases adjusted for changes in inventory are allocated to the operating equipment based on PI data for flows providing the most accurate possible Natural Gas consumption by unit operation.
- Actual coal consumption is calculated monthly based on purchases for the month adjusted for inventory changes.
- Steam produced by fossil fuels in the Waste Fuel and Recovery Boilers is calculated by using the fuel heat content and boiler efficiencies for the respective fuels. The total steam from fossil fuels is the sum of the preceding plus the total steam output from the Package Boiler (all Natural Gas).
- The steam from renewable fuels is assumed to be the balance of steam produced which is derived from Wood Waste (Waste Fuel Boiler) and Black Liquor (Recovery Boiler).

Fossil Fuel Boiler Efficiencies - Factors

Boiler	Fuel	mmBTU/Unit	Units	Efficiency	BTU/# Stm	# Stm / Unit
Package Boiler	Natural Gas	1.00	mmBTU	82.8%	1173	706
Waste Fuel Boiler	Natural Gas	1.00	mmBTU	82.8%	1110	746
Waste Fuel Boiler	Coal	24.00	Tons	82.8%	1110	17,897
Recovery Boiler	Natural Gas	1.00	mmBTU	73.0%	1166	626

Steam From Fossil Fuels by Boiler

Boiler	Fuel	Use	Units	#Stm/Unit	K# Steam
Package Boiler	Natural Gas	N/A	N/A	N/A	21,507
Waste Fuel Boiler	Natural Gas	19,099	mmBTU	746	14,242
Waste Fuel Boiler	Coal	39	Tons	17,897	698
Recovery Boiler	Natural Gas	5,623	mmBTU	626	3,521
Total					**39,968**

Renewable Steam Ratio by Boiler

Boiler	Renewable Fuel	Boiler K# Steam	Fossil K# Steam	Renewable K# Steam	Renewable Steam %	Coal %	NG %
Package Boiler	N/A	21,507	21,507	0	0.0%	0.0%	100.0%
Waste Fuel Boiler	Bark	278,771	14,940	263,831	94.6%	0.3%	5.1%
Recovery Boiler	Black Liquor	422,216	3,521	418,695	99.2%	0.0%	0.8%
Total		722,494	39,968	682,526	94.5%	0.1%	5.4%

The installation of TG2 coincides with an increase in output from the Recovery Boiler and Waste Fuel Boiler. There were no upgrades or anticipated increase in output from the Package Boiler. In alignment with this intent, the steam output from the Package Boiler will be allocated first to TG1. The balance of steam to TG1 will be at the ratio of output from the Recovery Boiler and Waste Fuel Boiler. The calculation of renewable energy from TG1 will be based on the ratio of fossil fuel steam to total steam.

TG1 Renewable Energy Calculation

Total Steam to TG1	414,590	K#
Package Boiler Steam to TG1	21,507	K#
Package Boiler Steam Avail. to TG2	-	K#
Steam from WFB & RB	393,083	K#
Steam Ratio of PB to (WFB+RB+PB)	5.2%	
Steam Ratio of WFB to (WFB+RB+PB)	37.7%	
Steam Ratio of RB to (WFB+RB+PB)	57.1%	
PB Steam Flow to TG2	21,507	K#
WFB Steam Flow to TG2	156,323	K#
RB Steam Flow - to TG2	236,760	K#
% Coal	0.1%	
% Natural Gas	7.6%	
% Renewable Steam to TG1	**92.3%**	

If the Package Boiler steam output exceeds TG1 capacity or TG1 is out of service, the balance of Package Boiler steam will be allocated to TG2 in proportion to the balance of package boiler steam not used on TG1 and the output of the two other boilers. The calculation of renewable generation from TG2 will generally be based on the ratio of steam output from the Recovery Boiler and Waste Fuel Boiler. The calculation of renewable energy from TG2 will be based on the ratio of fossil fuel steam to total steam.

TG2 Renewable Energy Calculation

Total Steam to TG2	247,770	K#
Package Boiler Steam after TG1	-	K#
Ratio of PB to (WFB+RB+PB) Steam	0.0%	
Ratio of WFB to (WFB+RB+PB) Steam	39.8%	
Ratio of RB to (WFB+RB+PB) Steam	60.2%	
PB Steam Flow	-	K#
WFB Steam Flow	98,534	K#
RB Steam Flow	149,236	K#
% Coal	0.1%	
% Natural Gas	2.5%	
% Rewewable Steam to TG2	**97.4%**	

Total Generation (both for On Peak and for Off Peak) is based on the archived PI System data. For each generator, the Net Generation (both for On Peak and for Off Peak) is determined by subtracting the Station Service (see Appendix B – Calculated Station Service) from the Total Generation.

Generating Unit	On Peak Power MWH	Off Peak Power MWH	On Peak Hours	Off Peak Hours	Station Service MW	On Peak Station Service MWH	Off Peak Station Service MWH	Total Net Generation MWH	On Peak Net Generation MWH	Off Peak Net Genertion MWH
TG1	9,308.4	11,142.0	336.5	407.5	0.8	268	325	19,857	9,040	10,817
TG2	6,307.1	7,730.5	336.5	407.5	1.5	504	611	12,923	5,803	7,120

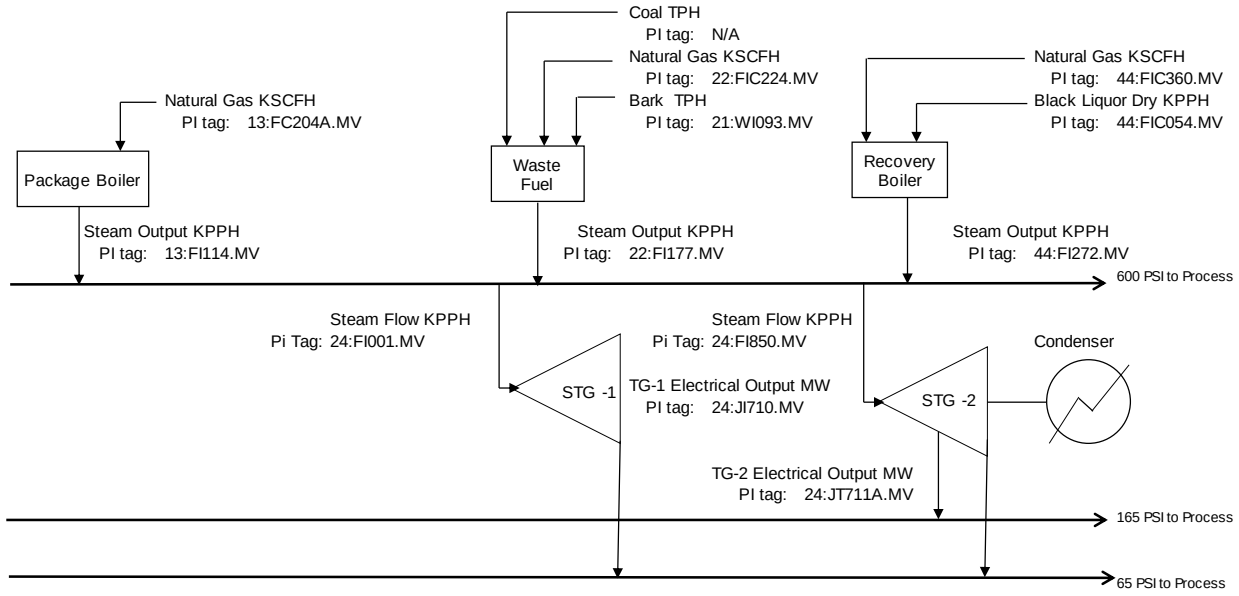
The Power from renewable fuels is calculated by multiplying the Net Power generated by the percentage of steam produced by renewable fuels for each generator.

Generating Unit	Total Net Generation MWH	On Peak Net Generation MWH	Off Peak Net Genertion MWH	Renew able On Peak MWH	Renew able Off Peak MWH	Renew able %	Coal %	NG %
TG1	19,857	9,040	10,817	8,345	9,986	92.3%	0.1%	7.6%
TG2	12,923	5,803	7,120	5,650	6,932	97.4%	0.1%	2.5%

APPENDIX A

Simplified Energy Diagram

Verso Paper Quinnesec Mill - Energy Flow Diagram



APPENDIX B

Calculated Station Service

The Mill power plant provides energy in a combined heat and power configuration for an integrated pulp and paper facility. A significant portion of the thermal energy from the power plant is used in the manufacture of pulp and paper. In fact, most of the energy produced in the Mill's boilers is used for manufacturing. This results in a situation where the load for the power plant is higher than might otherwise be expected for the amount of electrical generation. The configuration presents challenges with respect to estimating how much of the load used in the power plant should be allocated as station service for the purpose of calculating renewable energy credits.

There are three main (metered) breakers that provide power to the power plant and auxiliaries. A review of the connected horsepower to each breaker was completed to determine the percentage of connected load related to power and steam production on each, e.g. connected loads relating to the Water Treatment Plant (WTP) process water supply are excluded. The total power plant load is calculated by multiplying the metered load on each breaker by its respective power & steam related connected load percentage and totaling the result. The meter outputs are recorded in the PI system and monthly averages will be used in the calculations. Below is a sample calculation for total load (all calculations are based on January 2012 operating data).

Steam & Power Related Load by Feeder Breaker

Mill Breaker	Description	Total Breaker Load MW	Steam & Power Related Connected Load Ratio %	Steam & Power Related Load MW
H107	Waste Fuel	2.74	98.58%	2.70
H111	Recovery	4.98	85.91%	4.28
H110	Package & WTP	3.06	68.60%	2.10
	Total	10.78		**9.08**

In an effort to properly allocate power plant load between manufacturing and electrical generation, the Mill proposes to calculate the Station Service by multiplying the Steam & Power Related Load by the ratio of thermal heat consumed in the turbine generators to the total boiler steam energy output. The heat rate of each generator (million BTU of steam heat consumed by a turbine generator divided by the kilowatt-hour output) is used to determine the total heat required by each turbine. For the back pressure turbine, this value is relatively constant at 3,554mmBTU/KWH calculated from PI data in January 2012. TG2, which includes condensing, is somewhat more complicated. While the thermal load will vary with condensing power production, the expected range is from 7,363 mmBTU / KWH (winter conditions) to 10,500 mmBTU / KWH (summer conditions) with an annual average of 9,723 mmBTU / KWH. For purposes of the renewable energy calculation, Verso proposes to assume a fixed heat rate equivalent to the design annual average of 9,723 mmBTU / KWH. The boiler steam energy output is based on the sum of steam output from each boiler multiplied by the enthalpy rise in the unit. To

reduce complexity, each boiler enthalpy rise is fixed based on the process design of the upgraded power plant. Below is the calculation of total Station Service.

Thermal Load by Turbine Generator

Generating Unit	Power Output MWH	Heat Rate mmBTU/KWH	Total Thermal Energy mmBTU
TG1	20,450	3,554	72,681
TG2	14,038	9,723	136,488
Total	34,488	56%	209,169

Total Thermal Energy from Steam

Boiler	Steam K#	Factor	mmBTU
Package	21,507	1,173	25,234
Waste Fuel	278,771	1,110	309,539
Recovery	422,216	1,166	492,249
Total	722,494		827,021

Total Station Service based on Thermal Steam Energy to Power

	Value	Units
Boiler Thermal Energy	827,021	mmBTU
Generator Thermal Load	209,169	mmBTU
% TG Thermal Energy	25%	
Steam & Power Load	9.1	MW
Total TG Related Load	2.3	MW
Hours in Month	744	Hours
Monthly Station Service Load	**1,708**	**MWH**

The total Station Service is allocated between the two generators based on the ratio of their respective thermal energy consumed as shown below.

Station Service Allocation by Generator

Generating Unit	TG Thermal Energy % of Total	Station Service Allocation MW	Station Service Allocation MWH
TG1	34.7%	0.8	594
TG2	65.3%	1.5	1,115
Total	**100.0%**	**2.3**	**1,708**

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Summary: Response to Staff Interrogatories 14-0432-EL-REN electronically filed by Mr. Rex Zhang on behalf of VERSO QUINNESEC LLC and Brooks, Steven Mr.