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March 2, 2021

VIA E-MAIL
Angelika.Stewart@dec.ny.gov

Angelika Stewart
New York State Department of Environmental Conservation
Division of Environmental Permits, Region 4
1130 North Westcott Road
Schenectady, NY 12306-2014

RE: Supplemental Response to Request for Additional Information Related to the 2019 Climate Leadership and Community Protection Act
Global Companies, Albany Terminal
Air Title V Permit Application
DEC #4-0101-00112/00029
City of Albany, Albany County

Dear Ms. Stewart:

Global Companies LLC (Global or Applicant) is submitting this letter to supplement its previous submissions made in response to a pair of DEC requests for additional information (RFAIs) dated May 19, 2020 and September 11, 2020 seeking information concerning Global's application to renew and modify its existing Title V air permit for the Albany Terminal. Copies of those original submissions, excluding attachments, are included as Attachments A and B, respectively. Among other things, the RFAIs asked Global to assess the consistency of its proposed project with the goals of the 2019 Climate Leadership and Community Protection Act (CLCPA), Following submission of its December 3, 2020 response to the second RFAI, DEC asked Global to quantify the greenhouse gas (GHG) emissions associated with the extraction and transmission of project-related fuels imported into the state and combusted at the Albany Terminal. This submission responds to that request.

As set forth in greater detail in its previous submissions, Global has proposed various changes at its Albany Terminal, including, but not limited to: reducing its allowable crude oil throughput by 1,400 million (1.4 billion) gallons and overall allowable throughput by 950 million gallons; installing a vacuum assist ("vac assist") system to reduce fugitive volatile organic compound (VOC) emissions at the railcar loading rack; and installing exempt natural gas-fired boilers/heaters to enable the Terminal to manage biodiesel (collectively, the "Project").

As discussed in its December 3, 2020 RFAI response, although the boilers will increase direct GHG emissions at the Terminal, the Project will result in a significant reduction in overall GHG emissions based on the lifecycle GHG emission reductions associated with the substitution of biomass-based diesel for petroleum diesel. This conclusion does not change with the addition

of the GHG emissions associated with extraction and transmission of the natural gas proposed to be burned in the new boilers/heaters because lifecycle GHG emissions associated with renewable fuels generally and biomass-based diesel, in particular, are significantly lower than those associated with the petroleum-based diesel. As a result, the GHG emissions associated with the extraction and transmission of the natural gas proposed to be combusted in the new boilers/heaters are more than offset by the climate change benefits associated with switching to biodiesel.

The CLCPA requires significant reductions in stationary and mobile source GHG emissions by 2050. Global has proposed a modification to its Title V permit that would allow for the installation of small boilers/heaters needed to manage biodiesel at the Terminal. This supplemental response shows why the transition from petroleum-based to biomass-based diesel fuels will achieve significant reductions in lifecycle GHG emissions at the Terminal that will further the objectives of the CLCPA even if upstream emissions from the extraction and transmission of the natural gas proposed to be combusted in the new boilers/heaters is considered.

The GHG lifecycle emission data presented below demonstrates that on a per gallon basis, each gallon of biodiesel loaded emits approximately 6 lbs of lifecycle carbon dioxide equivalent (CO_2e) emissions less than comparable petroleum-based diesel. The analysis shows that Global needs to only replace 19 million gallons of petroleum-based diesel throughput per year with biodiesel to offset the maximum added boiler/heater GHG emissions and achieve emission reductions of CO_2e equivalent to a 40% reduction from pre-Project baseline emissions at the Terminal. If 50 million gallons of biodiesel throughput replaced petroleum-based diesel, the GHG lifecycle emissions would be reduced by 149,380 tons per year (tpy) of CO_2e. The more biodiesel the Terminal handles, the greater the benefits of the Project from a climate change perspective. The Project is thus consistent with the CLCPA goal of reducing GHG emissions 40% from 1990 levels by 2030.

Installing the proposed boilers/heaters would generate an immediate climate change benefit by facilitating the shift to a more climate-friendly fuel as the State transitions to a reduced carbon future under the CLCPA. DEC, in approving the proposed boilers/heaters, will further the goals of the CLCPA and allow the expanded use of biodiesel as a transitional substitute fuel for petroleum-based diesel.

Quantification of GHGs Associated with Fuel Extraction and Transmission

The CLCPA regulates various pollutants as GHGs. *See* 6 NYCRR § 496.5.[1] Each GHG has been assigned a CO_2e that represents "[t]he amount of carbon dioxide by mass that would produce the same global warming impact as the given mass of another greenhouse gas over a specific timeframe. . . ." 6 NYCRR § 496.3(b). As part of its December 3, 2020 submission, Global

[1] The CLCPA identifies six categories of pollutants as GHGs. DEC recently finalized regulations establishing statewide GHG emission limits under the CLCPA. In the final rule, DEC included a list of substances identified as GHGs, together with their carbon dioxide equivalent value. The only GHGs associated with the Project are carbon dioxide, methane and nitrous oxide.

quantified direct potential GHG emissions associated with the combustion of natural gas in the new boilers/heaters needed to handle biodiesel at the Albany Terminal. With the current submission, Global adjusted these combustion-related numbers to reflect the final CO_2e values found in DEC's recently adopted Part 496 regulations. For purposes of calculating the GHG emissions associated with the extraction and transmission of the fuel imported into the State and then combusted in those boilers, Global used the emission factors contained in DEC's February 2021 document entitled "Preliminary Interim Draft Emission Factors for Use by State Agencies and Project Proponents," which was supplied by DEC for this purpose. All emissions are measured in tons per year. Information about how these emissions were calculated can be found in Attachment C. A summary of the results is set forth below.

Potential GHG emissions from new boilers/heaters associated with direct combustion of natural gas at the Facility
CO_2: 27,619.76 tpy
Methane: 0.53 tpy (44.52 CO_2e)
Nitrous Oxide: 0.51 tpy (134.64 CO_2e)
Total CO_2e: 27,798 tpy (based on final Part 496 equivalency factors)

Upstream GHG emissions from extraction/transmission of natural gas imported into state and combusted in boilers/heaters at the Facility
CO_2: 6,165.77 tpy
Methane: 198.75 tpy (CO_2e 16,695 tpy)
Nitrous Oxide: 0.07 tpy (CO_2e 18.48 tpy)
Total CO_2e: 22,879 tpy

Combined CO_2e: 50,677 tpy

Note, however, that this number represents operation at maximum capacity for 8,760 hours per year. As set forth below, the Terminal's ability to manage biodiesel is constrained by transportation limits, offloading capacity, tank capacity, and other factors to a maximum of approximately 300 million gallons annually, meaning maximum GHG emissions associated with the planned biodiesel operation are far below the numbers presented above. Finally, Global anticipates running its biodiesel operations at most, approximately 25% of the time. As a result, actual GHG emissions associated with the Terminal's biodiesel operations are expected to be far below 50,677 tpy CO_2e.

Implications of Inclusion of GHG Emissions Associated with Extraction/Transmission on CLCPA Analysis with Respect to Boilers/Heaters

The inclusion of GHG emissions associated with the extraction/transmission of natural gas combusted at the Albany Terminal does not affect the conclusion in the December 3, 2020 submission that the Project is consistent with the goals of the CLCPA. The production and use of biofuel are encouraged by both federal and state programs, in large part because of its climate change benefits. As discussed in Global's earlier submission, analyses of fuels regulated under EPA's Renewable Fuel Standards (RFS) program show that biomass-based diesel and renewable fuels as defined under the RFS program emit significantly less GHGs than the petroleum-based

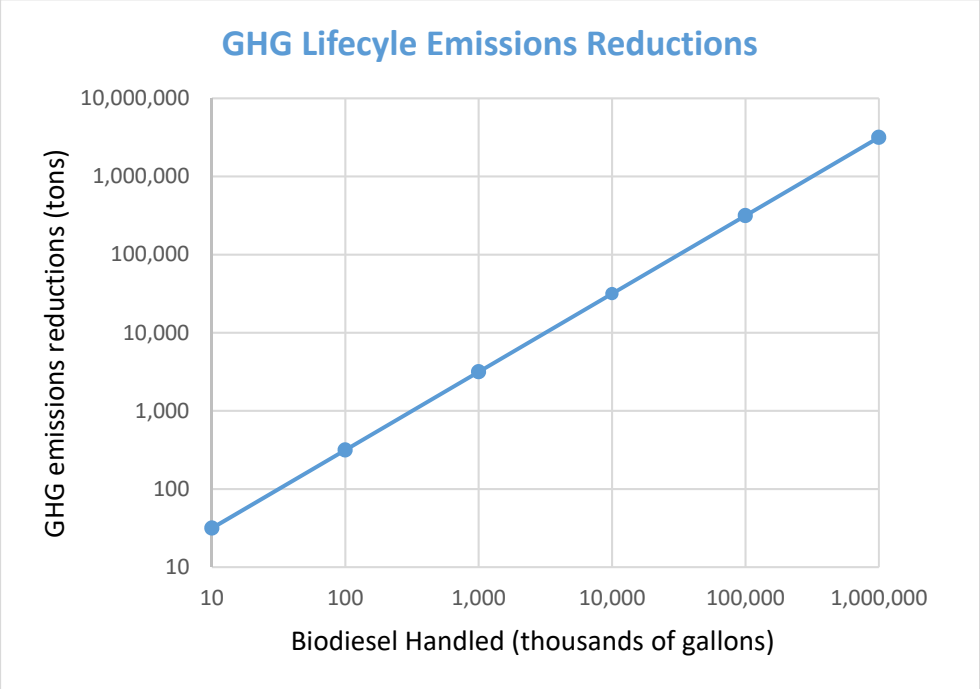
diesel they replace when measured on a lifecycle basis. To qualify as "biomass-based diesel" under the RFS program, the producer/importer must show that the particular type of diesel fuel has lifecycle GHG emissions that are at least 50% lower than comparable petroleum diesel. To qualify generally as "renewable fuel," the fuel must have lifecycle GHG emissions that are at least 20% less than the baseline fuel it replaces. *See* 40 CFR § 80.1401 for the relevant definitions. The lifecycle analysis includes all GHG emissions associated with the production of each type of fuel, including those associated with fuel production and transmission. In other words, the GHG emissions DEC has asked Global to quantify as part of its CLCPA analysis are already part of the assessment performed by EPA under the RFS program. EPA thus has already accounted for these emissions in deciding whether fuels achieve the GHG reductions necessary to qualify as renewable under the RFS program.

The December 3, 2020 submission showed that the more biodiesel the Terminal handles (relative to petroleum-based diesel) under the RFS program, the greater the overall climate change benefits.[2] A review of the lifecycle GHG emissions associated with petroleum versus biodiesel showed that the comparatively modest potential GHG emissions associated with operating the natural gas-fired boilers/heaters needed to manage the biodiesel will be more than offset by the GHG benefits of switching from petroleum to biomass-based diesel. This conclusion does not change with the addition of upstream GHG emissions associated with the extraction and transmission of the natural gas imported into the State and combusted at the Terminal.

In its December 3, 2020 submission, Global compared the GHG benefits associated with swapping biodiesel for petroleum diesel (i.e., distillate) with the additional GHG emissions associated with the combustion of the natural gas used to fuel the boilers/heaters needed to manage the biodiesel at the Terminal using the 20% threshold for renewable fuels, a conservative assumption. As this analysis showed, on a per gallon basis, each gallon of biodiesel loaded emits approximately 6 lbs of lifecycle CO_2e emissions less than petroleum distillate assuming the biodiesel is regulated only as renewable fuel (i.e., is subject to the 20% threshold under the RFS program). Without taking the upstream GHG emissions associated with "imports" into account, the analysis showed that Global would need to replace approximately 12,742,280 gallons of diesel with biodiesel to achieve emission reductions of CO_2e equivalent to a 40% reduction from pre-Project baseline emissions at the Terminal. If the upstream GHG emissions associated with the extraction and transmission of the imported natural gas are taken into account, the number increases to 19,059,116 gallons. This analysis shows that the total GHG emissions associated with operating the boilers/heaters at full capacity are more than outweighed by the GHG benefits of burning biodiesel rather than petroleum diesel.

[2] As noted in the December 3, 2020 submission, Global currently stores and distributes biodiesel blends within its terminal network which only contain biodiesel that qualifies as "biomass-based diesel" under the RFS program. This biodiesel emits a *minimum* of 50% less lifecycle GHGs than the petroleum diesel it replaces. In fact, certain biodiesel fuels that qualify as biomass-based diesel achieve lifecycle GHG emission reductions relative to petroleum diesel that exceed the 50% reduction threshold. To be conservative for purposes of its CLCPA analysis, however, Global assumed that the biodiesel it will manage using the boilers/heaters meets the less stringent 20% threshold for renewable fuels.

The graph below illustrates the relationship between GHG emissions from the boilers/ heaters needed to manage biodiesel at the Terminal and the GHG benefits associated with biodiesel versus petroleum diesel. In the December 3, 2020 submission, a value was created by dividing the 27,784 tons of GHG emissions from the boilers/heaters by the maximum volume of biodiesel product that can be managed at the Terminal (about 300 million gallons). To address the emissions associated with extraction/transmission of the natural gas combusted in the boilers/heaters, a new value was created by dividing all emissions associated with the boilers (i.e., on-site combustion and upstream extraction/transmission) by 300 million gallons. These boiler/heater GHG emissions were then deducted from the lifecycle GHG emission reductions to obtain an estimate of the per gallon GHG benefits of biodiesel relative to petroleum diesel taking the new boiler/heater emissions estimate into account. Again, the results were plotted for different levels of biodiesel product.



Updated calculations are included as Attachment D. The information provided clearly shows that the Project will have a significant climate change benefit even when upstream emissions associated with extraction/transmission are included since it will enable the Terminal to manage fuel with much lower lifecycle CO_2e emissions. These benefits more than outweigh the additional direct and upstream emissions associated with the boilers/heaters needed to manage those fuels.

Also, the analysis above assumes that the Terminal will be operating at maximum capacity, taking into account actual operating constraints direct CO_2e emissions from this new equipment are estimated at 27,798 tpy CO_2e assuming the units are operating 8,760 hours per year. However, as reported in Global's July 7, 2020 response to DEC's first RFAI, the boilers/heaters are expected to operate no more than approximately 25% of the time (up to approximately 2,200 hours per year). In particular, the boilers/heaters are not expected to operate as often in the summer as in the colder months. Under this more realistic scenario, GHG

emissions from the Terminal are expected to increase by approximately 6,950 tpy CO_2e as a result of natural gas combustion in the new boilers/heaters The upstream GHG emissions associated with the extraction and transmission of fuel under this scenario is only 5,720 tpy CO_2e, resulting in total anticipated GHG emissions annually of approximately 12,670 tpy CO_2e.

Implications of Inclusion of GHG Emissions Associated with Extraction/Transmission on CLCPA Analysis with Respect to Project Components Other than Boilers/Heaters

As discussed in the December 3, 2020 submission, the only major source of GHG emissions associated with the Project other than the new boilers/heaters are the vapor combustion units (VCUs) used to control VOC emissions from various loading operations. As previously noted, as part of the Project, Global is proposing to reduce total allowable product throughput at the Terminal by 950 million gallons. This change in allowable throughput—combined with the addition of a new vac assist unit at the rail loading rack that captures and combusts additional VOCs—is expected to result in a reduction in potential GHG emissions. The reduction in total allowable product throughput at the Terminal by 950 million gallons means the quantity of fossil fuel potentially available for capture and combustion in the VCUs will be reduced by 950 million gallons. No further analysis of GHG emissions associated with this aspect of the Project is therefore necessary.

Conclusion

The inclusion of the upstream GHG emissions associated with the extraction and transmission of fuel into New York for combustion at the Albany Terminal does not change the basic conclusion in the first and second RFAI responses that the Project is consistent with the goals of the CLCPA. The Project will reduce allowable crude oil throughput at the Terminal by 1,400 million (1.4 billion) gallons (75%) and overall allowable Terminal throughput by 950 million gallons (27%). These changes are consistent with the CLCPA goal of reducing reliance on fossil fuel. The portion of the Project targeted at facilitating the management of biodiesel will likewise help the State to reduce reliance on fossil fuels by encouraging a switch to biodiesel. Although operation of the boilers/heaters needed to manage biodiesel will result in increased direct emissions at the Terminal (associated with natural gas combustion in the boilers/heaters) and upstream emissions (associated with the extraction and transmission of the natural gas imported into the State), the climate benefits associated with managing biodiesel in light of the significant lifecycle benefits of biodiesel relative to petroleum diesel more than outweigh the environmental costs.

As discussed in previous submissions, both the federal and State governments have adopted laws specifically encouraging the use of biodiesel. Going forward, New York cannot readily fulfill these specific mandates or reach its broader climate change goals if it does not allow projects in the short term to facilitate the management of biofuels as the State transitions away from fossil fuels.

More generally, DEC is currently in the early stages of implementing the CLCPA. Because it does not know what shape final implementation of the law will take, it is respectfully suggested that DEC should be careful to not eliminate compliance options that may help the State reach its goals by adopting unduly strict interpretations of the law. Currently, it is unclear precisely what

role biodiesel will play in the transition away from fossil fuels. As discussed in Global's December 3, 2020 response, numerous homes in New York currently heat with distillate. Although it is our understanding that the State is considering implementing measures that would force homeowners to transition away from boilers and toward electrical heat, this change, if implemented, is still years away. In the interim, we suggest that DEC should encourage development of in-state capacity to manage biodiesel as a more climate-friendly substitute for distillate.

Global hopes that this submission satisfies the Department's remaining concerns regarding the consistency of its throughput reduction/biomass-based diesel Project with the goals of the CLCPA. If additional questions or concerns remain, please feel free to call or email.

Many thanks for your attention to this matter. I look forward to hearing from you.

Very truly yours,

Tom Keefe
Vice President Environmental, Health & Safety

Attachments

ATTACHMENT A
Response to May 19, 2020 Request for Additional Information
July 7, 2020

Global Companies LLC., 800 South Street, P.O. Box 9161, Waltham, MA 02454-9161 ph: 781-894-8800

July 7, 2020

Nancy M. Baker
Regional Permit Administrator
New York State Department of Environmental Conservation
Division of Environmental Permits, Region 4
1130 North Westcott Road
Schenectady, NY 12306-2014

RE: Response to Request for Additional Information (RFAI)
Global Companies, Albany Terminal
Air Title V Application
DEC #4-0101-00112/00029
City of Albany, Albany County

Dear Ms. Baker:

I am submitting this letter on behalf of Global Companies LLC (Global) in response to your May 19, 2020 letter requesting additional information in support of Global's application to renew and modify its existing Air Title V application for its Albany Terminal, submitted in March 2020. For your convenience, we have duplicated the text from your letter and provided our response to your request. Note that we have not included those items that do not require a response from Global.

General:

1. The text should be clarified to indicate how many boilers and heaters will be installed, and where. The Lube Oil Building and tracing lines for pumping throughout the system should be labeled, as should other relevant buildings and structures, the rail yard for staging of trains and loading areas.

   Response: Global is proposing to install additional heaters/boilers as follows:
   - One 4 mmBtu/hr and one 6 mmBtu/hr heater to be housed in an existing building located in the southwest corner of the site adjacent to Tank 32. These heaters will be used to provide heat to Tanks 30 and 33, which will be used to store biodiesel.
   - Four 9.9 mmBtu/hr boilers to be housed in the existing Lube Oil Building located adjacent to the rail loading rack. These boilers will be used to provide heat to the rail cars needed to facilitate the offloading of biodiesel.
   - One 4 mmBtu/hr heater to be housed in an existing building located in the central/eastern portion of the site in the vicinity of Tank A65. This heater will be used to heat trace the line to the dock.

   The Lube Oil Building, tracing lines for pumping throughout the system, the proposed heaters, the rail yard for staging of trains, loading areas, and other relevant buildings and structures

have been added to Diagram #1, Port of Albany Terminal, a copy of which is included as Attachment RFAI-A. This figure replaces Attachment B, Site Plan, in the EAF Supplement.

2. Please label the rail loading zone on the plans.
   Response: See response to Item 1 above.

Environmental Justice

1. The Department's Office of Environmental Justice has reviewed the modified proposal for conducting Environmental Justice outreach during the COVID crisis which is dated May 1, 2020. Please include this modification in the Public Participation Plan. The next public participation meeting can be scheduled in accordance with the modified plan. Please copy the Department on mailings, and please also consider social media outlets in addition to the methods listed to get the word out about meetings (twitter, facebook, etc.).

   Response: Global has revised its Public Participation Plan (PPP) to incorporate its proposal to address public outreach during the COVID crisis as Appendix D to the PPP with appropriate references to the Appendix added to the body of the PPP. A copy of the revised PPP is included as Attachment RFAI-B. Consistent with its commitment in the PPP, Global will provide copies of all stakeholder mailings to the individuals at DEC included on the Project's stakeholder list. As Global continues its outreach efforts, it will work with its Community Liaison and others to identify additional avenues for informing the public about upcoming meetings.

Water Usage

The application shows an increase in water use of 300 gpd, which will not be from a municipal source. Where is the water coming from, and what is its intended use.

Response: The application was incorrect. The 300 gpd increase in water will come from the City of Albany. The water will be used as boiler feed.

Climate Change

Section 7(2) of the 2019 Climate Leadership and Community Protection Act, Chapter 106 of the Laws of 2019 (CLCPA) requires all state agencies in considering permits and other decisions to consider whether such decisions are inconsistent with or will interfere with the achievement of the Statewide greenhouse gas (GHG) emission limits established in article 75 of the ECL. These GHG emission limits require a 40 percent reduction from 1990 levels by 2030, and an 85 percent reduction by 2050. ECL § 75-0107(1). Moreover, as set forth in the CLCPA, the Statewide GHG emissions include emissions of GHGs from sources within the State, as well as GHGs "produced outside of the State associated with either the generation of electricity imported into the State or the extraction and transmission of fossil fuels imported into the State." ECL § 75-0101(13). Therefore, please identify and explain whether the project will be consistent or inconsistent with the statutory Statewide GHG emission limits, including by taking into account GHG emissions from the facility itself, as well as both upstream and downstream indirect GHG emissions associated with the facility.

Response:

Introduction

In the RFAI, DEC is seeking feedback concerning the consistency of the Global Project with the goals of the CLCPA. As set forth in greater detail below, The Project calls for installing equipment needed to manage biodiesel, which is a crucial alternative for transitioning away from fossil fuels and is required by New York law to be blended into heating oil sold downstate. The biodiesel proposed to be managed at the Terminal has lifecycle GHG emissions that are 50% below the petroleum fuel it replaces and thus is preferable from a climate change perspective. Although the equipment required to manage the biodiesel will emit some GHGs, this impact is more than outweighed by the benefits associated with promoting the use of biodiesel to help achieve the GHG emission reduction goals of the CLCPA. The remaining components of the Project will result collectively in a significant reduction in potential GHG emissions from the Terminal primarily attributable to a significant reduction in allowable throughput.

Role of Global Terminal in Petroleum Market

As a preliminary matter, to understand the implications of the CLCPA for the Terminal, it is important to understand the role the Terminal plays in the fossil fuel supply chain. Typically, Global acquires and/or manages product delivered to the Terminal in one of two ways. First, Global purchases product and then sells it to customers who market it at retail. Under this scenario, Global effectively functions as a wholesaler, purchasing product in bulk and selling it in smaller quantities to companies such as home heating oil dealers or gasoline stations for sale to the public. In addition, Global is retained by other companies to handle their petroleum products. Under this scenario, the product is owned by a third party and Global is simply storing and distributing it in accordance with the customer's wishes.

The Global Terminal's role in the fossil fuel supply chain thus focuses on ensuring that fossil fuel products extracted and processed by third parties are properly stored and then distributed to wholesalers and retailers for eventual sale to the public. Global is not responsible either for producing fossil fuel products (e.g., extraction/refining) or for combusting the product it stores and distributes—both activities that result in direct emissions of quantities of GHGs. Global's role in the fossil fuel supply chain is like that of a large-scale liquid distribution warehouse. We are simply a break bulk storage company. Global acquires its own products or manages products owned by third parties, stores them at its "warehouse" (i.e., the Terminal), "breaks bulk," and then distributes the products in smaller parcels from the Terminal to wholesalers and retailers. As part of these activities, Global also engages in some on-site fuel blending.[1]

[1] In analyzing Global's climate change impacts for purposes of the CLCPA, it is important to distinguish the Terminal's role in fossil fuel storage and distribution from that of a pipeline in light of DEC's recent decision concerning the Transcontinental Gas Pipe Line Company's ("Transco") Northeast Supply Enhancement Project (hereinafter "Transco Project"). In its May 15, 2020 decision denying Transco's request for a water quality certification, DEC contended that the Transco Project was inconsistent with the State's efforts to transition away from fossil fuels, noting, among other things, it "could extend the amount of time that natural gas may be relied upon to produce energy, which could, in turn delay, frustrate or increase the cost of the necessary transition away from natural gas and other fossil fuels." Although both the Global and Transco projects involve fossil fuel distribution, that is where the similarity ends. The Transco Project calls for the investment of many millions of dollars on the construction of

Biodiesel Handling and Storage

As part of the Project, Global is proposing to install boilers/heaters to enable it to manage biodiesel. This portion of the Project is entirely consistent with and directly helps support federal and state climate change policy—including the GHG emission reduction mandate of the CLCPA—by facilitating the switch to biodiesel. As set forth in greater detail below, biodiesel has been identified as an important "transitional" fuel for climate change purposes. At the federal level, EPA's renewable fuel standard was enacted with the goal of increasing development of climate-friendly alternative fuels, including biodiesel, that have lifecycle GHG emissions that are significantly less than those associated with the petroleum fuels they replace. At the state and local level, New York has specifically mandated the addition of biodiesel to home heating oil in the downstate area in recognition of its climate change benefits. The Project thus is consistent with the goal of the CLCPA since it facilitates the transition away from fossil fuels.

Biodiesel Project Description

Biodiesel is a renewable, biodegradable fuel manufactured from vegetable oils, animal fats, or recycled restaurant grease. Like petroleum diesel, biodiesel is used to fuel compression-ignition engines. Although biodiesel can be combusted in its pure form, it is typically blended with petroleum diesel and used in a blended form.

Because most biodiesel in its pure form is comparatively viscous, it may solidify or become non-pumpable at the lower temperatures that are typically observed in the Northeast, requiring heating to return it to a pumpable state for loading and storage. To generate the necessary heat to manage biodiesel, Global is proposing as part of the Project to install natural gas-fired steam boilers and oil heaters to heat tanks, railcars and associated product lines. Global is also proposing to install heating coils in Tank 30 and authorize storage of heated biodiesel with a maximum storage temperature of 120º Fahrenheit in Tanks 30 and 33. The Project will enable Global to transfer biodiesel at the loading racks or create biodiesel blends within other distillate storage tanks at the facility. The tank cars arriving at the Terminal carrying biodiesel will be equipped with a jacket of noncontact piping located either on the outside of the railcar and/or coils within the cars. The railcar's noncontact piping will be attached to a hose upon arrival at the Terminal where steam will flow around the railcar through the jacket of piping similar to an old fashion home radiator. The heating will return the biodiesel to a pumpable state, enabling it to be pumped to Tanks 30 and 33, which will be similarly heated by circulating hot

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entirely new, major fossil fuel distribution infrastructure. This type of major investment necessarily contemplates several decades of expanded fossil fuel use. Second, the Transco pipeline contemplates the expansion of markets for fossil fuel products at a time when the State is attempting to discourage their use. By comparison, the Global Project does not involve significant new investment in fossil fuel distribution infrastructure or an expansion in fuel markets. In fact, Global is proposing to *reduce* the allowable throughput at its Terminal by 27%. Also, the Project proposed by Global will enable the Terminal to manage biodiesel, an important option for transitioning away from fossil fuels. The Global Project thus will not "delay, frustrate or increase the cost of the necessary transition away from natural gas and other fossil fuels." To the contrary, the Project will reduce the amount of product the Terminal can manage while at the same enabling Global to better manage its operations as New York transitions away from fossil fuels in accordance with the mandate of the CLCPA.

oil through heating coils within the tanks. The boilers and heaters will *not* be used to heat crude oil or other products managed at the Terminal.

Federal Programs to Encourage Use of Biodiesel

As noted above, both the federal government and New York State have adopted laws and regulations designed to encourage the use of biodiesel in place of petroleum-based diesel in recognition of biodiesel's significant climate change benefits. At the federal level, Congress enacted the Renewable Fuel Standards (RFS) program with the goal of increasing the amount of fuel derived from plants and other similar materials—such as biodiesel—as a substitute for fossil fuels. *See* Clean Air Act § 211(o), 42 U.S.C.A. § 7545(o). In defining biodiesel for purposes of the RFS program, the law requires that the fuel achieve a 50% reduction in lifecycle GHG emissions when compared to the petroleum diesel it is intended to replace. Accordingly, authorizing Global to install the equipment needed to manage biodiesel is consistent with the CLCPA goal of reducing GHG emissions.

Under the RFS program, as amended, transportation fuel[2] must contain an increasing percentage of renewable fuel, advanced biofuel, biomass-based diesel, and cellulosic biofuel, with the standard for each fuel based on the lifecycle GHG reductions achieved by the fuel relative to comparable traditional fuels. With respect to renewable fuels generally, the law requires transportation fuels to contain at least 9.0 billion gallons of renewable fuels in 2008, rising to 36 billion gallons by 2022. Each year, EPA reviews the quantities of the four types of renewable fuels generated to determine whether the production goals are being met and to make adjustments consistent with the RFS statute and regulations as necessary. Fuels that meet the definition of a particular fuel count toward determining whether the obligated parties are achieving their renewable fuel volume requirements.

To implement the program, EPA has established a credit program under which renewable fuel producers must register with EPA and provide detailed information about the renewable fuel(s) produced to the agency. Once that information has been approved by EPA, the producer can generate Renewable Identification Numbers (RINs)—unique numbers assigned to every gallon or renewable fuel produced or imported into the United States. These RINs can then be transferred along with the renewable fuel batches they represent to refiners or importers or separated from the renewable fuel they represent and then sold.

As previously noted, in deciding whether a particular fuel qualifies as renewable fuel, advanced biofuel, biomass-based diesel, or cellulosic biofuel, EPA must conduct an analysis of the lifecycle GHG emissions associated with the fuel to determine whether it meets the threshold in the statute for the fuel type. Under the statute, the term "lifecycle greenhouse gas emissions" is defined as "the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel

[2] The term "transportation fuel" is defined in the statute as "fuel for use in motor vehicles, motor vehicle engines, nonroad vehicles, or nonroad engines (except ocean-going vessels)." 42 U.S.C.A. § 7545(o)(1)(L). Although the focus of the program is on transportation fuel, the statute authorizes EPA to issue regulations that extend it to "additional renewable fuels"—a term that includes heating oil. 42 U.S.C.A. § 7545(o)(1)(A), 7545(o)(5)(E). EPA has exercised that authority and extended the RFS program to cover heating oil.

and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel by the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for the relative global warming potential." CAA § 211(o)(1), 42 U.S.C. § 7545(o)(1). To qualify generally as a "renewable fuel," fuels produced from new biorefineries must reduce lifecycle GHG emissions at least 20% when compared to the 2005 baseline average gasoline and diesel fuel they replace (with special rules for refineries in place or under construction when Congress enacted the RFS law). Other renewable fuels must meet the following, more stringent lifecycle GHG thresholds measured as a percent reduction from 2005 baseline gasoline or diesel fuel they replace: advanced biofuel, 50%; biomass-based diesel, 50%; and cellulosic biofuel, 60%.

Thus, to qualify as biomass-based diesel under the RFS program, the producer of the biodiesel must show that the fuel achieves a 50% reduction in lifecycle GHG emissions relative to the 2005 petroleum-based diesel it replaces. The lifecycle analysis considers direct and indirect upstream and downstream emissions associated with the generation, distribution and use of biodiesel. Projects designed to encourage the production, distribution and use of biomass-based diesel thus are consistent with the goal of reducing GHG emissions set forth in the CLCPA.

More generally, the federal government has adopted numerous programs that provide incentives to help build and maintain a market for biodiesel fuel and vehicles. These programs are summarized on the Department of Energy's Alternative Fuels Data Center at: https://afdc.energy.gov/fuels/laws/BIOD. In establishing these programs, the federal government was motivated by various goals, including the desire to reduce GHG emissions by substituting biodiesel for petroleum-based diesel.

New York State Programs to Encourage Use of Biodiesel

Like the federal government, New York State also has adopted programs to encourage the production and use of biodiesel. In 2017, New York State enacted a law—codified at New York Environmental Conservation Law § 19-0327—that requires all heating oil sold for use in buildings in Nassau, Suffolk and Westchester Counties effective July 1, 2018 to contain at least 5% biodiesel. The state law followed a pair of laws adopted by New York City to require heating oil sold for use in buildings in the City to contain a specified quantity of biodiesel. The original law required heating oil to contain at least 2% biodiesel beginning in 2012. In 2016, the City enacted a law increasing the amount of biodiesel in heating oil in the City to at least 5% on October 1, 2017. The blend then moves to 10% in 2026, 15% in 2030, and 20% in 2034. New York City Admin. Code § 24-168.1

GHG Emissions from the Terminal/Project

As previously noted, biodiesel is comparatively viscous. To manage biodiesel at the Terminal, Global must install equipment to heat the fuel to make it more "pumpable." As part of the Project, Global therefore is proposing to install natural gas-fired boilers and heaters to heat biodiesel. Potential CO_2 emissions from this new equipment are estimated at 27,784 tpy assuming the units are operating 8,760 hours per year. In fact, however, the boilers/heaters are expected to operate no more than approximately 25% of the time (up to approximately 2,200 hours per year). The boilers are not expected to operate as often in the summer as in the colder

months. This results in an expected actual increase in GHG emissions of approximately 6,950 tpy.[3]

To provide some context for this number, as discussed in the EAF Supplement, under EPA's Prevention of Significant Deterioration (PSD) program—the attainment equivalent of the nonattainment New Source Review program—EPA adopted special tailored applicability thresholds for new and modified sources of GHGs after concluding that the statutory thresholds for other pollutants were so low that they would result in an unmanageable expansion of the PSD program if applied to GHGs. 75 Fed. Reg. 31514 (June 3, 2010). Although the rule was eventually vacated by the U.S. Supreme Court,[4] it provides a useful basis for assessing the significance of GHG emissions. The so-called "GHG tailoring rule" established a 100,000 tpy major source threshold for GHG emissions measured in CO_2 equivalent, while the significant modification threshold was 75,000 tpy CO_2 equivalent. Facilities/projects with emissions below these thresholds did not trigger PSD for GHGs. As previously noted, GHG emissions from the Project are estimated at only 6,950 tpy, significantly below the 75,000 tpy significance threshold established by EPA under the GHG tailoring rule for modifications.

CLCPA Consistency Assessment
Global is in the business of delivering energy that is needed for daily life. Global recognizes both the ongoing and critical need for energy, and the need to move toward a future with increased renewables. Global is an active participant in the transition to renewable fuels. Nowhere is that more apparent than in Albany, with the proposal to manage biodiesel.

As previously noted, the biodiesel portion of the Project is consistent with the GHG emission reduction goals of the CLCPA because it will enable the Terminal to handle biodiesel—a comparatively climate-friendly fuel. As discussed above, both EPA and New York State have enacted measures designed to encourage the production and use of biodiesel as a replacement for petroleum-based diesel fuel. Of particular note, the RFS program establishes annual production goals for biomass-based diesel for the specific purposes of encouraging production of this fuel. To qualify as biomass-based diesel under the program, the producer of the biodiesel must demonstrate that the fuel's lifecycle GHG emissions are at least 50% less than its petroleum-based counterpart. In other words, biodiesel regulated under the RFS program generates 50% less GHGs than regular petroleum diesel. The RFS program reflects a desire by EPA to encourage production of biomass-based diesel for the purpose of reducing GHG emissions and addressing the problem of climate change.

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[3] Note that these GHG estimates vary slightly from what was in the EAF Supplement as boiler and heater capacities have since been finalized.

[4] The Supreme Court in *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014) concluded that while GHGs may properly be considered pollutants for purposes of the Clean Air Act, EPA was not barred from interpreting the term within its statutory context and excluding atypical pollutants, such as GHGs, that are emitted in such large quantities that their inclusion would make the Act unworkable. The court went on to find that including GHGs under the PSD program was unreasonable both because it would place a huge administrative burden on permitting agencies and because it triggered a transformative expansion of EPA's regulatory authority without clear congressional authorization. The decision thus was based on a finding that GHGs (in particular, CO_2) are emitted in significantly larger quantities than other pollutants and must be evaluated accordingly.

At the state/local level both the New York State legislature and New York City have adopted laws mandating the addition of biodiesel to home heating oil. Like the RFS program, these laws reflect a determination that biodiesel is preferable to its petroleum-based counterpart from a climate change perspective.

Accordingly, while the on-site management of biodiesel at the Terminal will result in emissions of GHGs, the adverse impacts of these additional emissions from a climate change perspective are more than outweighed by the benefits associated with facilitating the use of biodiesel in the State. Accordingly, the Project is consistent with the goals of the CLCPA.

Throughput Reductions

As part of the Project, Global is proposing to reduce the overall allowable throughput at the Terminal 27% from 3,329 million gallons to 2,379 million gallons, a 950 million gallon decrease. In particular, the Project calls for Global to reduce its existing cap on crude oil throughput by over 75%, from 1,850 million gallons to 450 million gallons, while increasing the cap on loading refined products by 450 million gallons.

From a climate change perspective, these changes represent a significant reduction in the total quantity of fossil fuels that can potentially be managed by the Terminal and thus the quantity of potential GHG emissions associated with those on-site management activities. From a broader perspective, reducing the quantity of product allowed to be managed at the Terminal decreases the amount of product Global can potentially distribute to customers. In essence, Global will no longer be associated in any way with the lifecycle GHG emissions associated with up to 950 million gallons of petroleum products. While the product may still be produced (generating GHG emissions associated with extraction and refining) and combusted, the Terminal will not play a role in that process.

Other Project Components

As set forth in the EAF Supplement, Global is proposing several other changes at the Terminal designed to improve Terminal operation and enhance the ability of Global to respond to changes in the market for its products.

Reconfiguration of Throughput Caps

As part of the Project, Global is proposing to reconfigure its throughput caps to allow for greater flexibility to respond to market changes. Currently, loading of gasoline and ethanol at the Terminal is capped at each of three loading areas: the truck loading rack, the rail loading rack, and the marine dock. Loading of distillate products (including diesel fuel, heating oil and kerosene) is capped on a facility-wide basis. The Project includes the addition of a facility-wide cap that incorporates all refined products (including gasoline, ethanol, distillates, blendstocks, and biodiesel) as well as a reconfiguration of the existing sub-caps at each of the loading areas. This reconfiguration of the caps will allow flexibility in the type and volume of products distributed at the individual loading areas to adjust to changing market conditions, while ensuring against major changes in truck or rail traffic. (See Section 2.3 of the EAF Supplement for a detailed discussion of the changes to the throughput caps at the Terminal.) The reconfiguration of the throughput caps is not expected to impact the Terminal's potential

GHG emissions. Moreover, as set forth above, Global is lowering the allowable Terminal throughput by 950 million gallons, a significant reduction.

Loading Rack Modifications

Global is proposing to add loading positions to its truck and rail racks to reduce wait times at the truck rack and the need to move railcars during loading. Currently, the truck loading rack is equipped with eight loading positions. Operation of the truck loading rack can become congested and is constrained during daily busy periods. The Project includes the addition of two loading positions to the truck loading rack to improve efficiency and reduce customer wait time and truck idling time.

The rail loading rack is currently equipped with eight loading positions. Since the rail loading area can accommodate up to fifteen railcars, loading all fifteen cars can require a locomotive to move the loaded cars out of the loading positions and move the empty cars into position. To improve efficiency and reduce locomotive use, the Project includes the addition of seven loading positions at the rail loading rack. The additional loading positions are not designed to increase the loading rate at the rack but will allow railcars to be loaded more efficiently and eliminate the need for interim movement of railcars to load certain trains.

The addition of new truck loading positions will not increase the overall amount of gasoline that can be throughput at the rack (which is capped as set forth above at current levels). However, the additional loading positions will enable Global to eliminate bottlenecks at the truck loading rack that occur at certain times of the day. This will decrease the amount of truck idling at the Terminal. Likewise, the addition of loading positions at the rail loading rack will allow Global to load a train more quickly while reducing the amount of movement required to situate the cars being loaded. This reduces the amount of time locomotives must be operated during the loading process.

Enhanced Air Emission Controls

Global is proposing to install a vacuum enhanced control system at the rail loading rack to ensure negative pressure loading, a change which will significantly reduce, if not eliminate, fugitive emissions from rail loading. While this change may increase GHG emissions by increasing the quantity of vapor combusted by the VCU, the increase is more than justified by the benefit to the community of reducing fugitive VOC emissions from the rail loading rack.

CLCPA Consistency Assessment

The throughput reduction/operational flexibility component of the Project is "consistent with the statutory statewide GHG emission limits" set forth in the CLCPA. The Project will reduce allowable throughput at the Terminal by 950 million gallons or approximately 27% from current allowable levels. This represents a reduction in potential emissions at the Terminal associated with management of product onsite. More broadly, the reduction means that the Global Terminal will no longer be involved in the management of 950 million gallons of petroleum and related products. The remaining components of the Project (reconfiguration of throughput caps, addition of loading positions, and enhanced air pollution controls) will collectively have little impact on potential GHG emissions at the Terminal.

Overall, these components of the Project are consistent with the goals of the CLCPA. The Project reduces the total quantity of petroleum and related products that can be managed at the Terminal and will replace a percentage of petroleum fuel with biodiesel and thus is consistent with the CLCPA goal of transitioning away from fossil fuels. The remaining changes are designed to reduce emissions and/or improve the efficiency of the Terminal's operations. Overall, these changes will reduce potential GHG emissions at the Terminal. Equally important, these changes will enable the Terminal to better adapt to market changes. New York is currently in the early stages of implementing the CLCPA. In the next 10 years, the market for fossil fuels in the State is likely to shift dramatically as measures to achieve the CLCPA goals are adopted. By reconfiguring the Terminal to allow Global to easily transition from one type of product to another, the Project will allow the Terminal to more efficiently respond to changes in the market, including the shift to more climate-friendly fuels.

Conclusion

As set forth in greater detail above, the proposed Project is consistent with the goals of the CLCPA. For a modest investment, the Project will: (1) reduce potential product throughput at the Terminal; (2) enable the Terminal to manage biodiesel, an important climate-friendly substitute for petroleum diesel as the State transitions away from fossil fuels; and (3) enhance the Terminal's ability to respond to changes during the transition toward a reduced carbon economy contemplated by the CLCPA.

Community Risk and Resiliency Act (CRRA)

Section 9 of the 2019 CLCPA added a new Section 17-b to the Community Risk and Resiliency Act, which provides that major permits for certain regulatory programs (including air) "shall require applicants to demonstrate that future physical climate risk has been considered." In reviewing such information, DEC has the authority require the applicant to "mitigate significant risks to public infrastructure and/or services, private property not owned by the applicant, adverse impacts to disadvantaged communities, and/or natural resources in the vicinity of the project." . . . Please clarify the discussion on pages 53 and 54 of the EAF is in consideration of future climate risk as required by Section 17-b of the Community Risk and Resiliency Act, as enacted by Section 9 of the CLCPA.

Response: The discussion on pages 53 and 54 of the EAF Supplement was in consideration of future climate risk as required by Section 17-b of the CRRA, as enacted by Section 9 of the CLCPA. As discussed in Section 12.2 of Global's EAF Supplement, based on the most recent Federal Emergency Management Agency (FEMA) map of the Terminal site (Map No. 36001CO194D, Effective March 16, 2015), the majority of the Terminal site is located within the 100-year floodplain of the Hudson River. For purposes of the CRRA regulations set forth at 6 NYCRR Part 490 identifying sea level rise potentials, the City of Albany (including the Terminal location) is in the Mid-Hudson Region.

Section 9 of the 2019 CLCPA requires applicants "to demonstrate that future physical climate risk has been considered" in conjunction with the particular project under review. With respect to the Project, the only additional physical risk from a climate change perspective is the increased risk of flooding attributable to climate change-related sea level rise. However, the

additional risk to the Project posed by flooding is limited to the destruction of the Project-related equipment. As discussed in the EAF Supplement, Global is proposing to install several exempt boilers and heaters to manage biodiesel, as well as additional loading positions at the truck and rail racks. This additional equipment will be located within the existing Terminal footprint and will be protected to the same extent as comparable equipment already in place. Moreover, all of the new heating equipment will be located inside existing buildings providing further protection against flooding. Equipment containing oil, such as small process tanks associated with the hot oil heating systems will be installed in accordance with major oil storage facility (MOSF) requirements for tanks within floodplains, as applicable.

With respect to flood risks, the Project does not call for the placement of fill or other encroachments into floodways or floodplains. It also does not call for any other changes to the configuration of the property that could raise base flood elevations or otherwise impact the potential path of floodwaters. Accordingly, the Project will not change the flooding-related risk to the Terminal or to any nearby properties.

In light of the above, the only potential climate-change risk associated with the Project is a financial one. In the event sea level rise increases the risk of flooding, Global faces an increased risk that the equipment installed as part of the Project will be damaged or destroyed. No other climate-related risks to the Project are anticipated.

No measures are required to "mitigate significant risks" identified in Section 17-b of the CRRA as follows.

- *Risks to public infrastructure and/or services.* The Project will not affect public infrastructure and/or services.
- *Risks to private property not owned by the applicant.* The Project will not affect private property not owned by Global.
- *Adverse impacts to disadvantaged communities.* The Project will not pose a "significant risk" to disadvantaged communities. As set forth in the Section 14.0 of the EAF Supplement, the Terminal is located in an industrial area near several environmental justice communities. The EAF and accompanying EAF Supplement show that the Project will not have an adverse impact on these communities, let alone pose "significant risks" relating to climate change that could potentially require mitigation. As previously noted, to ensure the communities adjoining the Terminal are provided with opportunities to learn about and comment on the Project, Global has prepared a comprehensive PPP to facilitate community outreach. This outreach should help ensure that possible adverse impacts to disadvantaged communities are identified and addressed.
- *Natural resources in the vicinity of the project.* As discussed in Section 8.0 of the EAF Supplement, the Project will be located at an existing industrial facility that has been in continuous operation since at least the 1920s. The area in the vicinity of the Project likewise has been urban/industrial for many decades. As a result, there are few natural resources at or near the site of the Project other than the Hudson River. Construction and operation of the Project will not affect the Hudson River. It also will not require the removal or destruction of on-shore vegetation or fauna or otherwise impact any

significant habitat areas or other natural resources. Accordingly, no mitigation is required to address natural resource impacts.

Truck Traffic:

1. Based on the application, the truck rack could have a potential of a combined 879,300,000 gallons per year (round up to 880,000,000 gallons per year for the sub-cap). It appears that truck traffic may increase due to rounding. Please clarify whether truck traffic will increase, or will remain the same (or less) with this proposal.

   Response: Potential truck traffic will remain the same with this proposal. Global will seek a subcap of 879,300,000, which reflects the sum of the existing throughput caps at the Terminal truck rack. This cap will ensure that potential truck traffic at the Terminal cannot exceed current permitted levels despite the changes contemplated by Global's operational flexibility proposal. The 880,000,000 gallon per year cap was the result of rounding but has been revised to the original number.

Air Application Technical Review:

1. Provide backup and justification for Project Emission Potential Calculations. Limits utilized, key emission factors, and basis of calculations description.

   Response: Additional notes and descriptions have been added to a revised Project Emission Potential (PEP), included as Attachment RFAI-C. As described in Note 1 on Page 1 of the PEP, the 1.9283 billion gallons of refined product is distributed across all internal floating roof (IFR) tanks as Conventional Gasoline to determine working losses from gasoline throughput. In addition, 506.54 million gallons of blendstock/component is distributed across the previously permitted blending project IFR tanks to calculate working losses. This throughput was the previously permitted tank throughput from the blending project. These working losses are in addition to the gasoline working losses, even though the throughputs are not additive. This was done to ensure a conservative emissions estimate. The crude oil throughput of 450 million gallons was distributed across all IFR tanks and included in the working losses. Crude oil has a separate throughput limit in the permit.

   Standing losses from all IFR tanks were assumed to be gasoline or blendstock/component. For example, if the tank is permitted for blendstock, the standing losses were calculated as blendstock. If the tank is permitted for other refined products or crude, the standing losses were calculated as gasoline. Emissions are highest for blendstock due to the assumption that it has a Reid vapor pressure (RVP) of 15 psi all year. Gasoline was assumed to have an annual average RVP of 13 psi. Both result in higher standing losses than crude oil, which was assumed to have an annual average RVP of 12.5 psi. All distillate tanks (non-IFR) were calculated with distillate standing losses. Working losses are not considered for distillate tanks because it is more conservative to assume the entire 1.9283 billion gallons of refined product is gasoline.

   As described in Note 2 on Page 1 of the PEP, the 1.9283 billion gallon throughput limit of refined project was included in the PEP. The total throughput was modeled as follows:

- 879.3 million gallons of conventional gasoline or lower RVP product at the truck loading rack loaded under negative pressure (i.e., with a "vac assist") and the vapor recovery unit (VRU) at 2 mg/L;
- 300 million gallons of conventional gasoline or lower RVP product at the rail loading rack with a vac assist and the vapor combustion unit (VCU) at 2 mg/L;
- 380 million gallons of blendstock at the marine loading dock with a vac assist and the VCU at 2 mg/L; and
- The remaining 369 million gallons of conventional gasoline or lower RVP product (1,9283-879.3-300-380) at the marine loading dock with a vac assist and the VCU at 2 mg/L.

Although up to 900 million gallons of refined product may be loaded at the marine dock, the PEP scenario described above maximizes throughput at the truck rack first because the truck rack has the lowest baseline emissions, thus maximizing the PEP. The next lowest baseline was the rail rack followed by the marine dock. This reasoning provides for a conservative approach since it minimizes the benefit of the baseline emissions and therefore maximizes the PEP.

Throughput totals have been added to the PEP for additional clarity. References to calculations have also been added and the calculations include references to emissions factors and the basis of calculations. See Attachment RFAI-C for details.

2. Please provide justification of Bakken Crude emissions factor utilized in calculations for marine loading, vapor pressure curve, lab test results and any other relevant information.

Response: A Bakken Crude emissions factor was not needed for calculating emissions for marine loading. First, there will be no fugitive emissions from the marine loading under normal loading because of the vac assist. Second, potential to emit (PTE) calculations were based on the permitted rating of the control device of 2 mg/L. Under these circumstances, no emission factor for Bakken Crude is necessary. Calculations are shown on Page 21 of the revised PTE calculations included as Attachment RFAI-D. The formula in the PTE is from AP-42 and uses a vapor pressure of 12.5 psi for Bakken Crude. However, while the emissions factor is calculated and shown, it is not used in the PTE since there are no fugitive emissions.

Emissions from loading without the vac assist system (when loading inerted vessels) were calculated assuming gasoline, which is more conservative, in order to simplify the ratios used for the proposed permit conditions. This is further discussed in response to Question 3 below.

3. Please provide justification for alternative operating scenario formula for inerted vessels, truck, rail loading if vapor assist system is not utilized or is offline.

Response: Ratios were used to determine the throughput equivalents for the alternate operating scenarios. Pages from the PTE have been highlighted and annotated to illustrate how the ratios were calculated. An example scenario using the formula has also been included. See Attachment RFAI-E for details.

In order to minimize the number of ratios in the permit, and to be conservative, the gasoline ratio of 0.81 was used for crude marine loading of inerted vessels since the emission factor for gasoline is higher than the emission factor for Bakken crude. Therefore, the Bakken crude emission factor was not used in the calculations, as discussed in the response to Comment 2.

4. Provide justification of tank calculations to include possible between tank transfers not captured by current PTE.

   Response: Tank to tank transfers are accounted for in the current PTE. The total tank throughput is 2,885,540,000 gallons. This includes 1,929,000,000 gallons of refined product plus 506,540,000 gallons of blendstock plus 450,000,000 gallons of crude oil. The 1,929,000,000 is a rounded refined throughput limit through the Terminal (actual number is 1,928,300,000). The tank throughput of 2,885,540,000 gallons is approximately 21% more than the total permitted rack throughput at the Terminal (2,378,300,000 gallons). Tank throughputs are detailed on Pages 5 and 7 of the Terminal PTE (Attachment RFAI-D) for clarity.

5. There appears to be a discrepancy with truck loading of 650,000,000 gallons per year and 229,300,000 gallons per year = 879,300,000 gallons per year vs 880,000,000 gallons per year. Please clarify.

   Response: Global was originally proposing to round the 879,300,000 gallons per year throughput to 880,000,000 gallons per year. However in order to keep potential truck traffic at the currently permitted levels, Global is proposing to keep the sub-cap at 879,300,000. Revised relevant pages from the permit application are included as Attachment RFAI-F.

6. There appear to be issues with the emission cap formula defined in conditions. VOC and HAP cap emission spreadsheets should be developed with ongoing discussion between the facility and Department. The Department also plans to use facility throughput caps and sub caps in conjunction with overall throughput limits.

   Response:
   Global is uncertain as to what the issue is that is referenced in this comment. There was no emission formula proposed, but rather a throughput formula for alternate operating scenarios. HAP conditions were included in the permit application. A total VOC cap has been proposed as a response to this comment. The proposed VOC capping condition is included as Attachment RFAI-G.

   As discussed in the response to Item 3 above, annotated pages from the PTE illustrating how the equivalent throughput formula was developed are included as Attachment RFAI-E along with example calculations.

7. Page number should be inserted on all pages of application for easier discussion points (ex. Pg 1 of X).

Response: Page numbers have been added to the application pages for clarity. The new Application pages are included as Attachment RFAI-H.

8. Use 11" x 17" paper for those sheets that have small font sizes would be helpful for reading.

   Response: Calculation pages have been provided on 11"x17" paper for clarity.

9. Please incorporate minor modifications with differing colors to indicate changes in the current 2012 issued permit. Please redline the current pending renewal / modification Department for clarity purposes.

   Response: Minor modifications that have been processed since the last permit have been added to the annotated permit, with the exception of the remediation system minor modification from 2015, as there was no existing language pertaining to the system in the current permit. The minor modifications are annotated in a different color for each minor modification. The revised annotated permit is included as attachment RFAI-I.

Many thanks for your attention to this matter. If you have any questions, or require any further information, please do not hesitate to call or email.

Very truly yours,

Tom Keefe
VP, EHS

Enclosures

ATTACHMENT B
Responses to September 11, 2020 Request for Additional Information
CLCPA Elements – December 3, 2020
Non CLCPA Elements – December 16, 2020

Global Companies LLC., 800 South Street, P.O. Box 9161, Waltham, MA 02454-9161 ph: 781-894-8800

December 3, 2020

VIA E-MAIL
Angelika.Stewart@dec.ny.gov

Angelika Stewart
New York State Department of
Environmental Conservation
Division of Environmental Permits, Region 4
1130 North Westcott Road
Schenectady, NY 12306-2014

RE: Request for Additional Information Related to the 2019 Climate Leadership and Community Protection Act
Global Companies, Albany Terminal
Air Title V Permit Application
DEC #4-0101-00112/00029
City of Albany, Albany County

Dear Ms. Stewart:

Global Companies LLC (Global or Applicant) is submitting this letter in response to DEC's September 11, 2020 Request for Additional Information concerning Global's application to renew and modify its existing Title V air permit for the Albany Terminal (hereinafter "Secord RFAI"). This letter focuses solely on the section of the request entitled "Greenhouse Gas Emission Reduction Consistency Analysis." In the request, DEC asks Global to expand upon its analysis of the consistency of the proposed modification as it relates to the goals of the 2019 Climate Leadership and Community Protection Act (CLCPA), as set forth in Global's July 7, 2020 response to DEC's first Request for Additional Information, dated May 19, 2020 (hereinafter "First RFAI"). The remainder of the response to DEC's Second RFAI will be addressed in a separate submission.

In brief, Global has proposed the following modifications to its Albany Terminal as set forth in its Title V permit renewal/modification application: (1) reduce allowable crude oil throughput from 1,850 to 450 million gallons (a 1,400 million gallon reduction, or about 75%) while reducing overall product throughput at the Terminal by 950 million gallons (a 27% reduction); (2) install exempt natural gas-fired boilers/heaters to enable the Terminal to manage biodiesel; (3) accept stricter emission limits on several of the Terminal's existing air pollution controls and install a new vacuum assist system ("vac assist") to reduce, if not eliminate, fugitive emissions at the railcar loading rack; (4) reconfigure the Terminal's existing throughput caps to enable the Terminal to better respond to market demand; and (5) add loading arms at the truck and railcar loading racks to reduce unnecessary truck idling and railcar movement, respectively (collectively, the "Project").

The First RFAI asked Global to assess the consistency of the Project with the CLCPA, which is codified primarily at New York Environmental Conservation Law (ECL) Article 75. In response, Global focused its analysis on the biodiesel handling and storage aspect of the Project because the boilers/heaters required to manage biodiesel are the only significant source of greenhouse gas (GHG) emissions associated with the Project. The First RFAI response described the biodiesel component of the Project in greater detail; summarized the federal and state programs intended to encourage the use of biodiesel, a low-carbon fuel; described the GHG emissions associated with the biodiesel component of the Project; and explained that the biodiesel component of the Project facilitates the management of biodiesel and is therefore consistent with the goals of the CLCPA.

In the Second RFAI, DEC has expanded on its request for information relevant to the consistency analysis. Global submits this second response, as it did the first response, without the benefit of final CLCPA regulations or Department-wide guidance on implementation of the CLCPA prior to the adoption of regulations. Key information sought by the Second RFAI is discussed below. The expanded analysis shows that the changes Global is proposing support the State of New York's GHG reduction goals. Global's proposed Project aligns with the State's objectives in the following ways:

- Global will voluntarily reduce its total product throughput cap by 27% and reduce its crude oil throughput cap by 75%, which is consistent with the State's goal of reducing reliance on fossil fuel and decreasing GHG emissions.
- Global will enhance its ability to manage biodiesel, a fuel that is key to the transition away from fossil fuel and reduces overall GHG emissions.

In order to manage biodiesel, Global will need to install natural gas-fired boilers and heaters to heat biodiesel so it will flow in colder weather. No other products, including crude oil, will be heated. The biodiesel component of the Project (which includes the boilers/heaters required to manage the biodiesel) will result in a significant reduction in overall GHG emissions based on the lifecycle GHG emission reductions associated with the substitution of biodiesel for petroleum diesel and is consistent with the CLCPA goal of reducing GHG emissions 40% below 1990 levels by 2030. The more biodiesel the Terminal handles, the greater the benefits of the Project from a climate change perspective.

Allowable GHG Emissions Before and After the Project (Excluding New Boilers/Heaters Required to Manage Biodiesel)

As set forth in greater detail in Global's First RFAI response, the Albany Terminal essentially functions as a fuel warehouse. Fuel is purchased from one location, stored at the Terminal and then shipped in bulk to entities who may either use it themselves or sell it to a third-party consumer. In the case of heating oil, the fuel may be burned by a residential, commercial or industrial source in the state or eventually consumed out of state. Likewise, gasoline shipped from the Terminal may eventually be sold and consumed either in state or out of state. The Global Terminal functions as a conduit for product, providing a link between the producer and the end-user. In this way, the Terminal is no different from a traditional wholesale distribution center, which collects products from various producers and then ships them to other wholesalers and/or retailers.

In determining the carbon dioxide equivalent (CO_2e) emissions from the Project, the Second RFAI asks Global to consider the impacts of the 27% reduction in overall allowable throughput at the Terminal from 3.329 million gallons to 2.379 million gallons as well as the impact of the Project's reduction in crude oil throughput from 1,850 million gallons to 450 million gallons. In essence, DEC is asking Global to quantify the potential GHG emissions associated with the storage and distribution of product throughput at the Terminal before and after the requested Title V permit modification is approved. These emissions include GHG emissions associated with day-to-day operation of the Terminal, in particular, carbon dioxide (CO_2) emissions associated with existing on-site fuel handling operations, etc.

The CLCPA regulates six pollutants as GHGs: CO_2, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride and assigns each GHG a CO_2 equivalent. The Terminal does not emit perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride. Accordingly, these GHGs are not addressed in the analysis.

As discussed in greater detail below, total GHG emissions from the Terminal are relatively low. These emissions originate almost exclusively from two sources—operation of the Terminal vapor combustion units (VCUs), which are used to control emissions of volatile organic compounds such as benzene associated with the Terminal's loading activities and—to a much lesser extent—miscellaneous small combustion equipment (e.g., office, garage and other similar boilers). The estimated emissions relating to the Project are set forth below.[1] All emissions are measured in tons per year (tpy). Information about how the emissions below were calculated can be found in Attachment A, which includes the Potential to Emit (PTE) for the Terminal's combustion sources.

Current Potential Emissions (based on allowable throughput):
CO_2: 18,338.9 tpy
Methane: 0.34 tpy
Nitrous Oxide: 0.35 tpy
Total CO_2e: 18,450.5 tpy

Future Potential Emissions (based on proposed allowable throughput excluding new boilers and heaters):
CO_2: 16,656.7 tpy
Methane: 0.32 tpy
Nitrous Oxide: 0.30 tpy
Total CO_2e: 16,755.7 tpy

[1] These numbers do not include emissions from the existing small boilers/furnaces used primarily to heat various parts of the Terminal (e.g., office, garage, water treatment building). The activities associated with this equipment—which have the potential to emit approximately 544.41 tons per year of CO_2e—will not change in any way as a result of the Project and so should not be considered in assessing the consistency of the Project with the CLCPA.

As set forth above and in Attachment A, the reduction in allowable Terminal throughput and other "non-boiler/heater" components of the Project reduce GHG emissions by approximately 1,694.8 tpy.[2]

GHG Emissions Associated with New Boilers/Heaters Required to Manage Biodiesel

The production and use of biofuel is encouraged by both federal and state programs, in large part because of its climate change benefits. As discussed in the response to the First RFAI, fuel producers and importers are regulated under EPA's Renewable Fuel Standards (RFS) program, which requires them to include increasing amounts of comparatively climate-friendly fuels, such as biodiesel, in transportation and other fuels, including home heating oil. In deciding whether a particular fuel qualifies as renewable fuel, advanced biofuel, biomass-based diesel, or cellulosic biofuel under the RFS program, EPA must conduct an analysis of the lifecycle GHG emissions associated with the fuel to determine whether the fuel meets the threshold in the statute for the fuel type. To qualify as biomass-based diesel under the RFS program, the producer/importer must show that the particular type of diesel fuel has lifecycle GHG emissions that are at least 50% lower than comparable petroleum diesel and meets other criteria spelled out in the RFS regulations. To qualify generally as "renewable fuel," the fuel must have lifecycle GHG emissions that are at least 20% less than the baseline fuel it replaces and meet other criteria spelled out in the regulations. See 40 CFR § 80.1401 for the relevant definitions. See the First RFAI response for additional information about the RFS program as it relates to the Global Project.

New York State and New York City have adopted laws requiring the inclusion of biodiesel in home heating oil in the downstate area. Other nearby states, including Massachusetts and Rhode Island, also have adopted laws encouraging the use of biodiesel. Global has played a key role in the distribution of biodiesel in the Northeast for many years. As the focus of many states shifts to increasing the use of biodiesel, Global has expanded the availability of biodiesel within its terminal network and continues to look for additional opportunities to facilitate greater use of biodiesel consistent with the various statutory mandates. Global is currently working with the United States Department of Agriculture under the Higher Blends Infrastructure Incentive Program (HBIIP). The HBIIP is designed to expand the sale and use of ethanol and biodiesel fuels by providing financial incentives to fuel suppliers to purchase equipment and make other changes designed to facilitate the management of renewable fuels. Global's current plan is to install biodiesel infrastructure not only at the Albany Terminal, but at several other terminals within New York and the Northeast states to increase the availability of biodiesel.

Heating oil will remain a key component of the energy landscape in the Northeast for the foreseeable future. According to the U.S. Energy Information Administration, in 2018

[2] The Second RFAI requests that Global use the emission factors in 40 CFR Part 98 to calculate GHG emissions from the Project. However, petroleum terminals are not among sources covered by EPA's GHG reporting program. Moreover, as set forth below, the key issue for purposes of assessing the GHG impact of the Project are the GHG benefits of biodiesel relative to the "costs" (i.e., GHG emissions) associated with operating the boiler/heaters needed to manage the biodiesel on-site. For purposes of that analysis, Global has relied on emission factors established under the Renewable Fuel Standards program, which more accurately reflect the relative merits of petroleum versus bio-based fuels on a lifecycle basis.

approximately 5.5 million households in the United States used heating oil as their main heating source, about 82% of which are located in the Northeast. Not surprisingly, New York is ranked first among the Northeastern states in residential heating oil consumption.[3] Accordingly, it is crucial to find ways to "decarbonize" heating oil until the homes that rely on it for heat can transition to another heating source. Biodiesel is a pathway to lowering the carbon footprint of heating oil and achieving the short-term goals of the CLCPA. To manage biodiesel in the cold climate of the Northeast, the fuel must be stored and heated.

In the Second RFAI, DEC asked for additional information about the GHG emission impacts of managing biodiesel at the Terminal. In particular, DEC asked about the status of the biodiesel managed by Global under the RFS program (in particular, whether Global's biodiesel meets the 50% threshold for biomass-based diesel), Global currently stores and distributes biodiesel blends within its terminal network which only contain biodiesel that qualifies as "biomass-based diesel" under the RFS program.[4] This biodiesel emits a *minimum* of 50% less lifecycle GHGs than the petroleum diesel it replaces. In fact, certain biodiesel fuels that qualify as biomass-based diesel achieve lifecycle GHG emission reductions relative to petroleum diesel that exceed the 50% reduction threshold. To be conservative for purposes of the CLCPA analysis, however, Global has assumed that the biodiesel it will manage using the boilers/heaters meets the less stringent 20% threshold for renewable fuels.

A review of the lifecycle GHG emissions associated with petroleum versus biodiesel shows that the comparatively modest potential GHG emissions associated with operating the natural gas-fired boilers/heaters needed to manage the biodiesel will be more than offset by the GHG benefits of switching from petroleum to biomass-based diesel even if it is assumed that the biofuel meets only the 20% lifecycle reduction threshold for renewable fuel.

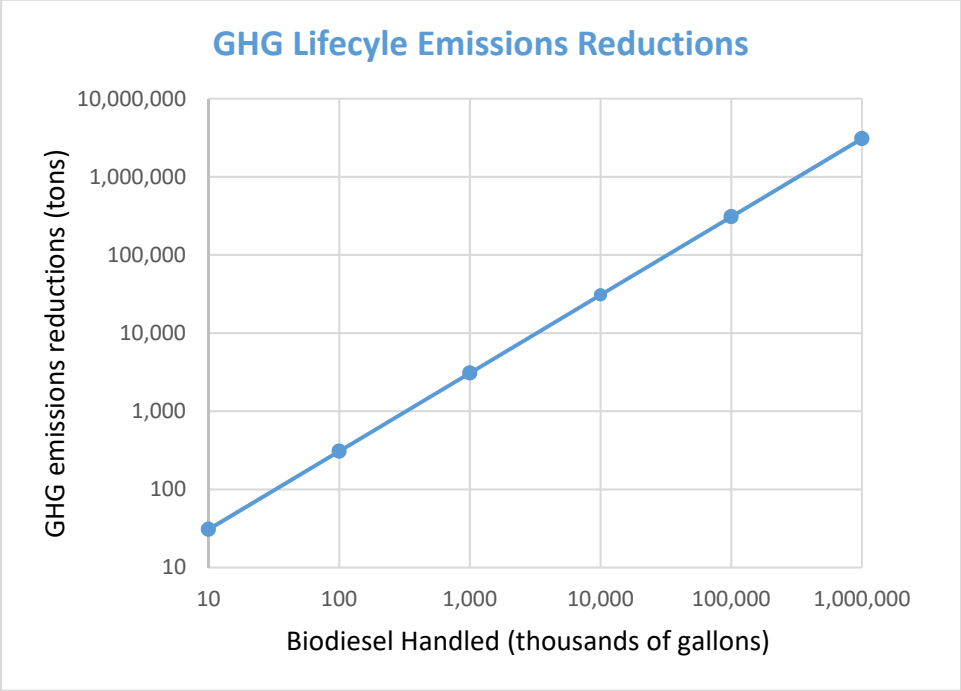
Per the Second RFAI, the CLCPA requires DEC—in considering Global's application to significantly reduce product throughput and install boilers/heaters to manage biodiesel—to confirm whether its decision on the application will be inconsistent with or interfere with the attainment of the Act's statewide GHG emission reduction limits. These limits—which were recently proposed by DEC—quantify the CLCPA's goal of reducing GHG emissions 40% below 1990 levels by 2030. To answer this inquiry, Global compared the GHG benefits associated with swapping biodiesel for petroleum diesel (i.e., distillate) with the additional GHG emissions associated with the combustion of the natural gas used to fuel the boilers/heaters needed to manage the biodiesel at the Terminal. As previously noted, although Global currently handles only biodiesel that meets the 50% minimum threshold for biomass-based diesel, Global conducted its analysis using the 20% threshold for renewable fuels. In other words, Global calculated the GHG emission benefits associated with biodiesel assuming a 20% reduction from the lifecycle GHG emissions of distillate fuel. The emission factor for the lifecycle GHG emissions of distillate was

[3] https://www.eia.gov/energyexplained/heating-oil/use-of-heating-oil.php.

[4] In particular, Global either buys biodiesel with biomass-based diesel renewable identification numbers (RINs) already attached or acquires biomass-based diesel RINs in the marketplace after the biodiesel has been purchased. In either case, the biodiesel acquired by Global is backed by RINs that satisfy the requirements for biomass-based diesel under the RFS program.

taken from the EPA summary of the lifecycle GHG analyses that EPA undertook for the RFS program. On a per gallon basis, each gallon of biodiesel loaded emits approximately 6 lbs. of lifecycle CO_2e emissions less than petroleum distillate assuming the biodiesel is regulated only as renewable fuel (i.e., is subject to the 20% threshold under the RFS program). Obviously, the GHG benefit is much greater for biodiesel that is classified as biomass-based diesel and subject to the 50% reduction threshold. Relevant calculations are included as Attachment B. The example provided in Attachment B shows that Global would need to replace approximately 12,742,280 gallons of diesel with biodiesel to achieve emission reductions of CO_2e equivalent to a 40% reduction from pre-Project baseline emissions. Attachment B also clearly shows that the potential GHG emissions associated with operating the boilers/heaters at full capacity are more than outweighed by the GHG benefits of burning biodiesel rather than petroleum diesel.

The graph below illustrates the relationship between GHG emissions from the boilers/ heaters needed to manage biodiesel at the Terminal and the GHG benefits associated with biodiesel versus petroleum diesel. A value was created by dividing the 27,784 tons of GHG emissions from the boilers/heaters by the maximum volume of biodiesel product that can be managed at the Terminal (about 300 million gallons). The boiler/heater GHG emissions were then deducted from the lifecycle GHG emission reductions to obtain an estimate of the per gallon GHG benefits of biodiesel relative to petroleum diesel taking the boiler/heater emissions into account. The results were then plotted for different levels of biodiesel product.



The information provided clearly shows that the Project will have a significant climate change benefit since it will enable the Terminal to manage fuel with much lower lifecycle CO_2e emissions and that these benefits more than outweigh the additional emissions associated with operating the boilers/heaters needed to manage those fuels.

It is worth noting that requiring Global to conduct a CLCPA analysis effectively penalizes the company for seeking approval of all components of the current Project as one Title V permit modification. Because the boilers/heaters associated with the biodiesel component of the Project are exempt from permitting under Title V, Global could have installed them without seeking DEC approval, and without triggering review under the CLCPA. Because Global is presenting the entire Project to DEC as a single "package," it is compelled to conduct a CLCPA analysis that may not otherwise have been required owing to the GHG emission reductions associated with the remainder of the Project.

Emissions Associated with Extraction/Transmission of Electricity and Fuels Imported Into State

The Second RFAI states that "The Department must consider GHGs emissions produced within the state from the project and GHGs emissions resulting from the project that are produced outside of the state that are associated with the generation of electricity imported into the state or the extraction and transmission of fossil fuels imported into the state." The statement presumably originates from the CLCPA, which defines "statewide greenhouse gas emissions" as "the total annual emissions of greenhouse gases produced within the state from anthropogenic sources and greenhouse gases produced outside of the state that are associated with the generation of electricity imported into the state and the extraction and transmission of fossil fuels imported into the state. . . . " ECL § 75-0101.13. DEC's decision to include the reference to imports in the Second RFAI suggests that they want Global to quantify out-of-state emissions associated with "imported" electricity and fuels relating to the Project in its CLCPA consistency analysis. Assuming this interpretation of the Second RFAI is correct, this request raises several concerns. First, while the statute speaks generally about the need for the *state* to consider GHG emissions associated with "imports," it does not clearly specify how *sources* are expected to address those emissions. Second, the request could be interpreted as requiring Global to quantify emissions associated with the extraction and transmission of all fuels it "imports" into the State not just those Global consumes, which raises significant concerns.

The discussion of the need to account for electricity and fuel "imports" appears in just two sections of the CLCPA—the definition of "statewide greenhouse gas emissions" quoted above and the discussion of the Statewide Greenhouse Gas Emission Report in ECL § 75-0105.3. Nowhere in the CLCPA does the law specifically require *sources* to supply that information, let alone make them responsible for considering those emissions in assessing the consistency of projects with the CLCPA. Likewise, the recent rulemaking proposing GHG emission limits under the CLCPA addresses only GHG emissions from "imported" electricity and fuels statewide. The rulemaking does not discuss how such emissions are to be addressed with respect to individual facilities/projects. Absent clear regulatory direction, Global should not be required to take emissions associated with these imports into account in assessing the consistency of the Project with the CLCPA. To the extent in-state sources are expected to quantify GHG emissions associated with "imports," the obligation should fall on the electricity/natural gas supplier not the consumer.

The challenge with making sources responsible for quantifying GHG emissions associated with imports is most obvious in the case of imported electricity. An electricity purchaser, such as Global, has no way to determine whether the electricity it uses was generated

in-state or imported from out-of-state. Absent such information, electricity purchasers, such as Global, cannot be responsible for considering imported electricity as part of their project-specific CLCPA consistency analyses.

Although the issues relating to natural gas are slightly different, the conclusion is the same. In the case of natural gas, the product is combusted by the consumer. As a result, the consumer—in this case, Global—can reasonably be expected to account for its own direct emissions in assessing its activities under the CLCPA. However, while the consumer can control its own, direct GHG emissions (by operating less, installing more fuel efficient equipment, etc.), it has no control over emissions associated with its extraction and transmission. Accordingly, it should not be accountable for those emissions for purposes of assessing the consistency of a project with the CLCPA.

Another concern with the Second RFAI is that the mention of imported electricity and fuel arguably could be interpreted as requiring Global to quantify the extraction and transmission emissions associated with all the fuel it "imports" into New York State for management at the Terminal not just the fuel it actually combusts on-site. However, DEC's recent rulemaking clarifies that the requirement in ECL § 75-0101 to include emissions associated with the extraction and transmission of fuels imported into the State is limited to fuels consumed in the State. In August, DEC proposed regulations setting statewide GHG emission limits for 2030 and 2050 as required by the Act. The limits include both GHGs produced outside the state that are associated with the generation of electricity imported into the state and those associated with the extraction and transmission of fossil fuels imported into the state. The Regulatory Impact Statement (RIS) accompanying the rulemaking makes clear that the requirement to quantify the GHG emissions associated with fuel imports is limited to fuels imported *and consumed* in the State. For example, the RIS specifies that statewide GHG emissions include "certain sources that are located outside of the state that are associated with *in-state energy consumption*" (emphasis added). Likewise, the discussion of lifecycle or out-of-state emissions refers to "upstream emissions associated with *in-state energy demand and consumption*" (emphasis added). Global does not consume the fuel it imports nor can it say for certain where the fuels it manages are finally consumed (i.e., whether they are consumed in-state or out-of-state). In light of these considerations, Global should not be required to quantify emissions associated with the fuel it "imports" into the State.

Overall Project GHG Consistency Analysis

The Project is consistent with the goals of the CLCPA.

- The Project will reduce allowable crude oil throughput at the Terminal by 1,400 million gallons (75%). This change is consistent with the CLCPA goal of reducing reliance on fossil fuels.
- The Project will reduce overall allowable throughput at the Terminal by 950 million gallons (27%). This change is consistent with the CLCPA goal of reducing reliance on fossil fuels.
- The 950 million gallon reduction in overall Terminal throughput reduces allowable emissions associated with the actual on-site management of product at the Terminal, in particular, the emissions associated with the operation of the VCUs used to limit emissions of benzene and other volatile organic compounds at the Terminal.

- The change in the Terminal's throughput caps will improve operational flexibility as well as Global's ability to respond quickly to changes in the fuel market, many of which will be driven by efforts to implement the CLCPA and handle low-carbon fuels. The CLCPA can be expected to change the mix of fuels available in the marketplace. For example, the goal of reducing GHG emissions may lead to a switch from petroleum to biodiesel. The change in the throughput caps will facilitate achievement of that goal.
- The emission increases from the Project are due *solely* to operation of the boilers/heaters needed to manage biodiesel. As set forth above, the climate benefits associated with managing biodiesel more than outweigh the costs in terms of emissions from the natural gas-fired boilers/heaters needed to manage the biodiesel, even under the conservative assumption that the biodiesel only meets the standard for renewable fuel not the stricter standard for biomass-based diesel. The emission reductions associated with the management of biodiesel are consistent with the CLCPA goal of reducing GHG emissions 40% below 1990 levels by 2030.

Options for Further Reducing GHG Emissions

The Second RFAI asks Global to "discuss whether and in what manner new GHG emissions from the project or any other GHG emissions associated with current operations at the Albany Terminal can be further reduced, such as the use of alternate fuels, electricity, etc. If there are no technologically and economically feasible methods of further reducing GHG emissions, please confirm the same and provide an explanation."

Options for reducing GHG emissions from the Project are limited.

- As noted above, the only increase in GHG emissions associated with the Project is due to the boilers/heaters required to manage biodiesel. These boilers are proposed to be fired using natural gas. Global has investigated the option of installing electric heating in place of the planned natural gas-fired boilers and has determined that electrically heating the tanks is infeasible because electrical heaters cannot supply the energy necessary to adequately heat the product in tanks of the size and diameter of those at the Terminal.
- The vast majority of the GHG emissions relating to current Terminal operations are linked to operation of the VCUs. The VCUs reduce emissions of VOCs, such as benzene, from the Terminal and ensure that the marine loading operations comply with Coast Guard requirements relating to explosion prevention.
- The changes intended to improve operational flexibility (in particular, the replacement of product/loading rack-specific caps with facility-wide caps) do not require Global to purchase new equipment or modify existing equipment. Accordingly, this aspect of the Project provides limited opportunities for Global to implement alternatives to reduce GHG emissions.

DEC has also asked whether "GHG emissions associated with current operations at the Albany Terminal can be further reduced." The Title V permit review process for a modification is limited to an assessment of the emissions implications of the Project. DEC does not require the Applicant to review facility operations that are unaffected by the proposed changes.

The enactment of the CLCPA does not change the scope of the Title V decision-making process. Although the CLCPA may require assessments of GHG emissions from the facility as a whole after implementing regulations are promulgated, no such obligation exists now. CLCPA § 7.2 addressing permits and approvals requires agencies in considering and issuing permits to "consider whether such *decisions* are inconsistent with or will interfere with the attainment of the statewide greenhouse gas emission limits" (emphasis added). The *decision* in this case, is whether to grant Global's Title V permit modification request. Accordingly, the focus must be on those aspects of the modification that have the potential to negatively impact GHG emissions. Global should not now be required to assess GHG reduction options for the entire facility simply because it is seeking permission to make physical changes to small portions of its relatively small Terminal.[5]

Moreover, as noted above, the vast majority of emissions from the Terminal are linked to the operation of the VCUs and proposed boilers/heaters. The remaining combustion equipment at the Terminal is small and emits very little GHGs. As a result, the remaining equipment does not offer opportunities for significant GHG emission reductions.

GHG Mitigation Measures

For the reasons set forth above, the Project is consistent with the GHG emission limits set forth in the CLCPA. Accordingly, no mitigation measures are necessary.

De Minimis Nature of GHG Emissions Associated with the Proposed Project

In the Second RFAI, DEC declares that "neither the Climate Act nor any state regulatory authority presently identifies any specific thresholds for new or modified sources of GHG emissions for the applicability of the Climate Act's statewide GHG emissions limits." While this statement is technically correct, ECL § 75-0103.14(c) specifically authorizes the New York State Climate Action Council to "[t]ake into account the relative contribution of each source or source category to statewide greenhouse gas emissions, and the potential for adverse effects on small businesses, and recommend a de minimis threshold of greenhouse gas emissions below which emission reduction requirements will not apply." This provision reflects a recognition by the Legislature that not all GHG emitting sources should be treated equally and that the Legislature expects the Council to take the quantity of GHG emissions into account when deciding how to treat particular sources or source categories under the CLCPA. Those same considerations should govern DEC's review of individual projects pending full implementation of the CLCPA.

As reported in Global's response to the First RFAI, Global estimates actual emissions from the boilers/heaters needed to manage biodiesel at only 6,950 tons or 6,305 metric tons. By way of

[5] In theory, Global's request to reduce its throughput and reconfigure its throughput caps implicates the entire Terminal in the proposed Title V permit modification. However, it makes no sense to require Global to evaluate alternatives for reducing GHG emissions associated with its entire operation simply because it is proposing a change (a significant reduction in total allowable throughput) that provides a climate change benefit and does not require any changes to existing equipment or the purchase of new equipment.

comparison, the Astoria Generating Station in Queens reported 726,414 CO_2e metric tons of GHG emissions in 2018 under EPA's GHG reporting program (40 CFR Part 98). As this comparison shows, the Global Albany Terminal is a comparatively small source of GHG emissions. In determining what type of submission is required to demonstrate consistency with the CLCPA, DEC must consider the relative contribution of the source to the State's GHG emissions.

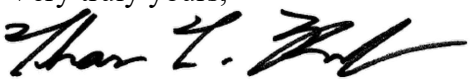
Conclusion

From a GHG perspective, the Project is comprised of two basic components: the installation of natural gas-fired boilers/heaters to enable the Terminal to manage biodiesel and the remainder of the Project, which includes reductions in crude oil and total product throughput, installation of a new vac assist system to control fugitive emissions from the railcar loading rack, reconfiguration of the Terminal product caps, and installation of additional loading positions. The 75% reduction in allowable crude oil throughput and 27% reduction in allowable total product throughput is consistent with the basic goal of minimizing fossil fuel use in the State. Moreover, as discussed above, the "non-biodiesel" components of the Project reduce possible GHG emissions associated with Terminal operations by reducing allowable product throughput. Although the boilers/heaters needed to manage biodiesel will emit GHGs, these emissions are more than outweighed by the lifecycle GHG benefits associated with biodiesel as compared to the petroleum diesel it replaces. Overall, the Project is consistent with the CLCPA goal of reducing GHG emissions 40% below 1990 levels by 2030.

Global hopes that this submission satisfies the Department's concerns regarding the consistency of its throughput reduction/biomass-based diesel Project with the goals of the CLCPA. If questions or concerns remain, Global would welcome the opportunity to discuss its approach to CLCPA consistency with Department staff in the hopes of resolving any outstanding issues and avoiding the need for multiple future submissions.

Many thanks for your attention to this matter. I look forward to hearing from you.

Very truly yours,



Tom Keefe
Vice President Environmental, Health & Safety

Attachments

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December 16, 2020

VIA E-MAIL
Angelika.Stewart@dec.ny.gov

Angelika Stewart
New York State Department of Environmental Conservation
Division of Environmental Permits, Region 4
1130 North Westcott Road
Schenectady, NY 12306-2014

Re: Response to Request for Additional Information (excluding CLCPA)
Global Companies, Albany Terminal
Air Title V Application
DEC #4-0101-00112/00029
City of Albany, Albany County

To Ms. Stewart:

This letter is in response to your letter dated September 11, 2020 regarding the Global Companies Albany Terminal Air Title V Application. Responses to your request for additional information relating to the air permitting and application comments in the letter are provided below. Our response to comments relating to consistency with the Climate Leadership and Community Protection Act (CLCPA) were provided in a separate letter.

Dispersion Modeling

NYSDEC Comment: "The protocol states the version of the proprietary Breeze software that they will be using, but not the version of AERMOD. The modeling report should state the version of AERMOD used, which should be 19191."

Response: The modeling report will state the version of AERMOD utilized in the dispersion modeling. Typically, the version is not specified in the protocol in case a newer version of AERMOD is released prior to completion of the modeling and submission of the report.

NYSDEC Comment: "The protocol proposes to use the urban dispersion option but does not provide details of the land-use analysis that led to that decision. We do not recommend the use of the urban dispersion option outside of the New York City metropolitan area. Rural dispersion should be used. The urban option behaves unpredictably when used with population figures under one million."

Response: The protocol has been revised to account for rural land use, rather than urban, in accordance with the latest version of the NYSDEC DAR-10 guidance. The revised protocol is attached as Appendix A.

NYSDEC Comment: "The protocol proposes to model internal floating-roof tanks as area sources, with the release height equal to the height of the tank. Instead, we request that they be modeled as volume sources, with the release height set to one half the height of the tanks. Area sources are not subject to downwash in AERMOD, and in our judgment a volume source is a better representation of the emission, helping to account for the downwash effect of the tank structure."

Response: Regarding the use of volume source rather than area source assumptions for the tank emissions, it should be clarified that neither of these source options accounts for building downwash. There is an adjustment for the initial vertical dimension for both area and volume sources, which is calculated as follows in the protocol:

$$\text{Initial vertical dimension} = \frac{\text{Release height}}{2.15}$$

In our experience, the results are very similar when assuming elevated area sources for tanks as compared to volume sources. However, given NYSDEC's request to change the assumptions for the tanks for this protocol, the revisions have been made in the revised protocol attached as Appendix A.

Emissions Calculations

NYSDEC Comment: The benzene emissions appear to be a conservative assessment as the consultant used a benzene liquid fraction in refined product (gasoline) of 1.8% which equates to a vapor fraction of 0.41%. In recent years, the highest liquid benzene content in gasoline in the Albany area has been 0.83%.

Response: Although the benzene concentrations are often lower than what was assumed in the potential to emit (PTE) calculations, to be conservative, Global used a more conservative number to account for worst case conditions. Benzene in gasoline was assumed to be 1.3% which is the maximum benzene content allowed in gasoline per 40 CFR 80.

NYSDEC Comment: The hydrogen sulfide (H2S) emissions were based on using a liquid concentration of 10 ppm. Some pipeline carriers of crude oil have H2S limits on transport between 5 – 10 ppm. The H2S content estimate used by Envirospec appears to be a reasonable estimate.

Response: No comment.

NYSDEC Comment: Envirospec accurately accounted for all emission releases from the facilities truck rack VRU, Rail VCU, and Marine two VCUs, and fugitives from the truck rack, barge loading and rail loading. In addition to the routine tank losses (standing, working), Envirospec included losses from landings. They will be assessing short-term impacts from one tank landing at each of the tanks and the tank with the highest emissions will be included in the short-term

impacts. Envirospec plans to include all routine tank losses, fugitives, VRU and all VCU releases for the annual impacts and routine tank losses, one-tank landing, fugitives, VRU and all VCU releases for short-term impacts.

Response: No comment.

Other Application Comments

1. Page 13 of 36
Please provide more details regarding how you derived your emission factor for Bakken Crude oil. Laboratory data, TVP and RVP data for Bakken crude to show that emission of gasoline are less and are ratioed appropriately for throughputs.

Response: Extensive vapor pressure sampling was completed by Global when Bakken Crude oil was stored on site. The data was used to develop product specific vapor pressure curves, which are provided as Appendix B. The vapor pressure curves were based on multiple samples of crude oil that were tested for true vapor pressure at four different temperatures – 40 deg F, 60 deg F, 80 deg F and 100 deg F. The purple curve on the graph in Appendix B is not a sample, but was developed from AP-42 Chapter 7, Figure 7.1-13a – True vapor pressure of crude oils with a Reid vapor pressure of 2 to 15 pounds per square inch. The values for true vapor pressure were read from the figure at the same four temperatures for RVP 12.5 psi crude oil for comparison with the Global data. The RVP of 12.5 psi was selected as an annual average RVP of the Bakken crude oil to be consistent with the permit application. As shown on the graph, the true vapor pressure from AP-42 is significantly higher than the actual vapor pressure of the Bakken at all temperatures. When calculating the emission factor for crude oil loading in the PTE, the formula (AP-42 Chapter 5, Section 5.2 Equation 2) uses true vapor pressure. To be conservative, Global used the annual average Reid vapor pressure of 12.5 psi at the annual average ambient temperature. This vapor pressure assumption is significantly higher than any of the measured true vapor pressures at the same annual average ambient temperature. The calculated crude oil emission factor is lower than the gasoline emission factor provided in AP-42 Chapter 5, Table 5.2-2. Therefore, gasoline loading fugitive emissions would be higher and gasoline was used for the loading ratio for crude operating scenario #CRD2 (marine loading of inerted vessels).

2. Page 3 of 36 Emission Summary Sheet
Please supply data on methanol specification sheet for biodiesel that shows methanol content and provide this information for the different grades of biodiesel.

Response: A Safety Data Sheet (SDS) for biodiesel is attached as Appendix C. The ASTM specification for biodiesel can be found at https://afdc.energy.gov/fuels/biodiesel_specifications.html. The ASTM specification shows the maximum concentration of methanol in biodiesel is 0.2%. This standard is for B100, which would have the maximum concentration of methanol, as lower grades of biodiesel are mixed with distillates which do not contain methanol.

3. Page 7 of 36 Throughputs
Please explain where you obtained all throughputs. Fixed roof tanks can only handle distillate. IFR can handle any product. The header labeled Petroleum will be changed to Refined. This should help clarify product throughputs.

Response: Refined product was modeled with working losses and standing losses as the worst-case emissions for each tank. A throughput table is included in the PTE. Emissions from each product that could be stored in a particular tank were calculated and the highest emissions for standing and working losses were used. The column header has been changed for clarity along with an additional note. A copy of the revised PEP and PTE are attached as Appendix D.

4. Page 11 of 36
Clarify and explain the ratioed gasoline/ethanol and that the distillate rail loading is captured in gas truck loading which is worst case scenario.

Response: The gasoline/ethanol is not a ratio. The title has "gasoline/ethanol" because the previous PTE throughput was based on gasoline or ethanol. The headers have been changed to "refined product" to represent the most emissive refined product and footnotes have been added. Refined product loading is calculated at the allowable mg/L limit of the control device and includes the entire allowable refined product throughput at each rack. A copy of the revised PTE is attached as Appendix D.

5. Page 14 of 36
Clarify and explain why this page has zero emissions.

Response: All loading emissions have been calculated as gasoline loading so that any less emissive product (such as distillate products) could be loaded under the refined product throughput cap. A note was added to the attached PTE for clarity for both distillate truck and rail loading. A copy of the revised PTE is attached as Appendix D.

6. Page 19 of 36
Add clarifying notes to this page related to discussion because 99.9% of vapors goes to the VCU because of the nitrogen, and the 3.900 lb/1000 gal comes from AP-42.

Response: Notes were added to the attached PTE for the 99.9%. There are already two notes stating that the 3.9 lb/1000 gallons is from AP-42.

7. Page 20 of 36
Clarify that this page is backup at marine loading, where they have two VCUs.

Response: A note was added to the attached PTE. A copy of the revised PTE is attached as Appendix D.

8. Page 24 of 36 Landings
What product is the worst case product for each tank? Please clarify.

Response: No changes to landings or cleanings calculations were proposed as part of the application and there will be no increase in actual tank landing emissions related to the Project. An emissions cap has been proposed for landing emissions so it would not matter which product is modeled in the PTE. The language for the proposed cap was included in the permit application. The permit condition will require total landing and cleaning emissions to stay under the emissions cap.

9. General
Tanks 4.09D – please remove all references throughout application since AP-42 should be utilized not TANKS 4.09D program which is no longer supported. Please use the in-house spreadsheet to develop calculations.

Response: The references have been removed. AP-42 Chapter 7 (June 2020) were used to calculate tank emissions. A revised PTE is included as Appendix D.

10. General
SCC's – please correct 4-03-101-99. It is not an SCC in this list of codes. Also please use 4-04 codes for bulk terminals. 4-03 references petroleum refineries.

Response: The SCC codes were updated and the revised application forms are attached as Appendix E.

Application Form Comments

NYSDEC Comment: While the Application is submitted on an older application form, the forms have not changed significantly and therefore, the form is acceptable to the Department. However, many of the application form boxes were left incomplete or incorrect. Understandably, some fields do not apply to this facility, but those that do should be completed. For example, on Page 3 of the Application, Biphenyl and Methylphenol are not emitted by the facility, and likely were pre-populated in the application forms in error. Those should be removed. Any information that does not apply to the facility should be noted as n/a.

Response: These compounds are prepopulated on the form. We have removed them. Boxes that are N/A are normally left blank as there are numerous boxes that would need to be populated with N/A. However, the boxes have been populated with N/A per your request. Revised application forms are included as Appendix E.

Full EAF

NYSDEC Comment: Similarly, several boxes and questions on the Full EAF have not been completed or are incomplete. This form should be completed to the full extent applicable and returned with your submission.

Response: Box D.1.c units was unintentionally left blank and has been completed. Most of the other boxes that were not completed were intentionally left blank because the answers were "no" and the rest of the boxes are only applicable "if yes", and therefore the boxes are not applicable.

Other boxes were expanded upon where possible and specific sections of the EAF supplement were added for clarity. The revised Full EAF Form is attached as Appendix F.

Greenhouse Gas Emission Reduction Consistency Analysis

As previously noted, this analysis was provided under separate cover.

We hope that the responses adequately address the Department's concerns. Please call or email if you have any questions concerning this letter.

Very truly yours,

Tom Keefe
Vice President Environmental, Health & Safety

Attachments

ATTACHMENT C
Greenhouse Gas Emissions Calculations

Fuel Combustion Emissions

Existing Exempt Combustion Sources:

Unit ID	Product	Source	Gal/yr (Liquid)	SCF/yr (Gas)	Liters/year (Gas)	MMBTU/yr
NA	Distillate	Furnace	590			–
NA	Natural Gas	Boiler (water bldg)	–			54
NA	Natural Gas	Boiler (garage)	–			22
NA	Natural Gas	Boiler (office)	–			163
NA	Natural Gas	Furnace	–			120

Proposed Exempt Combustion Sources:

Unit ID	Product	Source	Gal/yr (Liquid)	SCF/yr (Gas)	Liters/year (Gas)	MMBTU/yr
NA	Natural Gas	Heater (line trace)	–			35,040
NA	Natural Gas	Boiler (line trace)	–			35,040
NA	Natural Gas	Boiler (tanks)	–			52,560
NA	Natural Gas	Boiler (lube bldg)	–			86,724
NA	Natural Gas	Boiler (lube bldg)	–			86,724
NA	Natural Gas	Boiler (lube bldg)	–			86,724
NA	Natural Gas	Boiler (lube bldg)	–			86,724

Existing Non-Exempt Combustion Sources:

VCUML/VCUM2/VCURR*	Natural Gas	VCU	–			150,000

*Includes natural gas used as assist gas for both marine VCUs (VCUML and VCUM2) and the rail VCU (VCURR)

Distillate Combustion Emissions:

	Combustion Emissions									
Pollutant	PM 2.5	PM10	SOx	NOx	VOC	CO	CH4	N2O	CO2	GHG**
Emission Factor - lb/1000 gal*	2.00	2.00	0.21	20.00	0.20	5.00	0.22	0.26	2.2E+04	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	1.18	1.18	0.13	11.80	0.12	2.95	0.13	0.15	13157.00	13,208.20
tons/yr	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	6.58	6.60

* Emission factors used to estimate emissions are from AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I. SOx, Nox, CO, and PM Emission Factors are from Table 1.3-1. VOC and CH4 Emission Factors are from Table 1.3-3. CO2 Emission Factor is from Table 1.3-12. N2O Emission Factor is from Table 1.3-8.

** GHG Emission calculated by using the CO2 Equivalency Factor for CO2 (1), CH4 (84), and N2O (264)

Example calculation (using SOx):
= gal/yr / 1000 gal * Emission Factor
= 590 gal/yr / 1000 gal * 52.54 lb/1000 gal (SOx)
= 31.00 lb/yr

Natural Gas Combustion Emissions (from existing sources)*:

	Combustion Emissions									
Pollutant	PM2.5	PM10	SOx	NOx	VOC	CO	CH4	N2O	CO2	GHG***
Emission Factor - lb / MM BTU**	0.0075	0.0075	0.00059	0.098	0.0054	0.082	0.002	0.002	117.647	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	1,120.32	1,120.32	88.45	14,741.08	810.76	12,382.51	339.04	324.30	17,689,294.12	17,803,390.06
tons/yr	0.56	0.56	0.04	7.37	0.41	6.19	0.17	0.16	8,844.65	8,901.70

*Total emissions from natural gas combustion from existing sources include emissions from the combustion of natural gas in furnaces and boilers and emissions from the combustion of natural gas used as assist gas in the VCUs.

** Emission factors used to estimate emissions are from AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I, Tables 1.4-1, 1.4-2, and 1.4-3, except for GHG.

** GHG Emission calculated by using the CO2 Equivalency Factor for CO2 (1), CH4 (84), and N2O (264)

Total Natural Gas Used 150,359 MMBTU/yr

Example Calculation (using SOx):
= Total Natural Gas Used * Emission Factor
= Total Natural Gas Used (150,359) MMBTU/yr * 0.00059 lb / MM BTU
= 117.86 lb/yr

Natural Gas Combustion Emissions (from proposed sources)*:

	Combustion Emissions									
Pollutant	PM2.5	PM10	SOx	NOx	VOC	CO	CH4	N2O	CO2	GHG***
Emission Factor - lb / MM BTU**	0.0075	0.0075	0.00059	0.098	0.0054	0.082	0.002	0.002	117.647	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	3,498.50	3,498.50	276.20	46,032.94	2,531.81	38,667.67	1,058.76	1,012.72	55,239,529.41	55,595,824.38
tons/yr	1.75	1.75	0.14	23.02	1.27	19.33	0.53	0.51	27,619.76	27,797.91

*Total emissions from natural gas combustion from proposed sources include emissions from the combustion of natural gas in proposed boilers.

** Emission factors used to estimate emissions are from AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I, Tables 1.4-1, 1.4-2, and 1.4-3, except for GHG.

** GHG Emission calculated by using the CO2 Equivalency Factor for CO2 (1), CH4 (84), and N2O (264)

Total Natural Gas Used 469536.00 MMBTU/yr

Example Calculation (using SOx):
= Total Natural Gas Used * Emission Factor
= Total Natural Gas Used (469,536) MMBTU/yr * 0.00059 lb / MM BTU
= 276.2 lb/yr

VCU Vapor Combustion Emissions
(Emissions from Combustion of Petroleum Product Loaded)

Petroleum Vapor Combusted (lbs):

6,215,882	Total
3,510,000	at VCUML (gasoline and ethanol loading) (See Marine Loading - Refined Product Calculations.)
808,865	at VCUM2 (crude loading) (See Marine Loading - Crude Oil Calculations.)
1,897,017	at VCURR (gasoline loading) (See Rail Loading - Refined Product Calculations.)

Conversion from Petroleum Vapor Combusted in lbs to MMSCF (as Natural Gas Equivalent):

MMSCF (as Natural Gas) = Petroleum Vapor Combusted (lbs) * (21,000 BTUs / lb gasoline (high avg. for C4-C8 gases)(/ (1000 BTU/SCF) / (1,000,000)

MMSCF (as Natural Gas) combusted at VCUML =	74
MMSCF (as Natural Gas) combusted at VCUM2 =	17
MMSCF (as Natural Gas) combusted at VCURR =	40

Marine VCU Emissions from Gasoline & Ethanol Loading (Emission Unit VCUML):

	Combustion Emissions									
Pollutant	PM 2.5	PM10	SOx	NOx	VOC*	CH4	N2O	CO	CO2	GHG
Emission Factor - lbs / MM SCF**	7.60	7.60	197.47	150.00	NA	2.30	2.20	84.00	120,000.00	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	560.20	560.20	14,555.66	11,056.50	NA	169.53	162.16	6,191.64	8,845,200.00	8,902,251.54
tons/yr	0.28	0.28	7.28	5.53	NA	0.08	0.08	3.10	4,422.60	4,451.13

Marine VCU Emissions from Crude Oil Loading (Emission Unit VCUM2):

	Combustion Emissions									
Pollutant	PM 2.5	PM10	SOx	NOx	VOC*	CH4	N2O	CO	CO2	GHG
Emission Factor - lbs / MM SCF**	7.60	7.60	197.47	150.00	NA	2.30	2.20	84.00	120,000.00	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	129.09	129.09	3,354.29	2,547.92	NA	39.07	37.37	1,426.84	2,038,339.24	2,051,486.53
tons/yr	0.06	0.06	1.68	1.27	NA	0.02	0.02	0.71	1,019.17	1,025.74

Rail VCU Emissions from Gasoline & Ethanol Loading (Emission Unit VCURR):

	Combustion Emissions									
Pollutant	PM 2.5	PM10	SOx	NOx	VOC*	CH4	N2O	CO	CO2	GHG
Emission Factor - lbs / MM SCF**	7.60	7.60	197.47	150.00	NA	2.30	2.20	84.00	120,000.00	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	302.76	302.76	7,866.76	5,975.60	NA	91.63	87.64	3,346.34	4,780,482.47	4,811,316.58
tons/yr	0.15	0.15	3.93	2.99	NA	0.05	0.04	1.67	2,390.24	2,405.66

* These emissions are from gasoline and crude oil vapor combustion and pilot light gas. Gasoline and crude oil VOCs are already accounted for in the VCU emissions (i.e. 2 mg/l loaded or 98% efficiency).

** PM Emission Factor is from AP-42 (Table 1.4-2), as it is higher than the Emission Factor from the VCU manufacturer of zero (0). SOx Emission Factor is calculated as described below. NOx Emission Factor is from VCU manufacturer, as it is higher than the AP-42 Emission factor of 140 lbs/MMSCF (Table 1.4-1). CO Emission Factors is identical from VCU manufacturer and AP-42 (Table 1.4-1). CO2 Emission Factor is from AP-42 (Table 1.402).

** GHG Emission calculated by using the CO2 Equivalency Factor for CO2 (1), CH4 (84), and N2O (264)

Example calculation of SOx Emission Factor:

SOx Emission Factor = $y_{H2S} * (1/C) * M_{SO2} * MW_{SO2}$ (Equation from EPA Emission Inventory Improvement Program (EIIP) Document Volume 3, Ch.10: Preferred & Alternative Methods for Estimating Air Emissions from Oil and Gas Field Production & Procesing Operations, Sept. 1999, Pg 10.2-16.)

$y_{H2S,\ crude\ oil}$ =	0.001	(mole fraction of H2S in inlet gas (lb mole H2S/ lb mole) based on 10 ppm H2S liquid concentration)
C =	379.00	(molar volume of ideal gas at 60F and 1atm (scf/lb-mole))
M =	0.99	(molar conversion ratio from H2S to SO2 (lb-mole SO2/lb-mole H2S) (From VCU Manufacturer))
MW =	64.066	(molecular weight of SO2 (lb SO2/lb-mole SO2))
$EF_{SOX,crude\ oil}$ =	197.47	lb/ MMSCF

Total of Combustion Sources

Pollutant	PM 2.5	PM10	SOx	NOx	VOC	CH4	N2O	CO	CO2	GHG
lb/yr	5,612.06	5,612.06	26,141.49	80,365.85	3,342.69	1,698.16	1,624.36	62,017.94	88,606,002.24	89,177,477.30
tons/yr	2.81	2.81	13.07	40.18	1.67	0.85	0.81	31.01	44,303.00	44,588.74

Emergency Generators (Exempt) Updated with Part 496 emission factors

Emergency Generator Sources:

Fuel Type	Source	Gal/hr (Liquid)	SCF/hr (Gas)	Gal/hr (Gas)	MMBTU/hr*
Propane	QT100 Generator	13.9			1.26
Propane	QT100 Generator	13.9			1.26
Natural Gas	20kw NG Generator		1,020		1.02
Diesel	500kw	26.1			
Diesel	350kw	18.5			
Diesel	350kw	18.5			

*Generac Spec Sheet states, "For BTU content multiply gal/hr x 90950 (LP) or ft3/hr x 1000 (NG)."

Distillate Fired Engine Emissions:

	Pollutant									
Pollutant	PM2.5	PM10	SOx	NOx	VOC	CO	CH4	N2O	CO2	GHG**
Factor - lb/1000 gal*	2.00	2.00	0.21	20.00	0.20	5.00	0.22	0.26	2.2E+04	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	63.10	63.10	6.72	631.00	6.31	157.75	6.81	8.20	703,565.00	706,303.04
tons/yr	0.03	0.03	0.00	0.32	0.00	0.08	0.00	0.00	351.78	353.15

* Emission factors used to estimate emissions are from AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I. SOx, Nox, CO, and PM Emission Factors are from Table 1.3-1. VOC Emission Factor is from Table 1.3-3. CO2 Emission Factor is from Table 1.3-12.

** GHG Emission calculated by using the CO2 Equivalency Factor for CO2 (1), CH4 (84), and N2O (264)

Example calculation:
= gal/yr / 1000 gal * emission factor

Natural Gas & Propane Fired Engine Emissions:

	lbs Pollutant / MM BTU									
Pollutant	PM2.5	PM10	SOx	NOx	VOC	CO	CH4	N2O	CO2	GHG**
Factor* - lb/MMBtu	0.0099	0.0099	0.0006	2.270	0.0296	3.720	0.230	0.2	110.0	(CH4*84)+(N2O*264)+(CO2*1)
lb/yr	17.58	17.58	1.04	4,027.45	52.52	6,600.04	408.07	408.07	195,162.55	337,169.92
tons/yr	0.01	0.01	0.00	2.01	0.03	3.30	0.20	0.20	97.58	168.58

* Emission factors used to estimate emissions are from AP-42 Table 3.2-3. No emission factor was available for N2O so the CH4 emission factor was used.

** GHG Emission calculated by using the CO2 Equivalency Factor for CO2 (1), CH4 (84), and N2O (264)

Example Calculation of Natural Gas Usage

= Natural Gas Used 1,774 MMBTU/yr Assumes 500 hours/yr

= Natural Gas Used * Emission factor

Total of Generator Sources

Pollutant	PM2.5	PM10	SOx	NOx	VOC	CO	CH4	N2O	CO2	GHG
lb/yr	80.68	80.68	7.76	4,658.45	58.83	6,757.79	414.88	416.27	898,727.55	1,043,472.95
tons/yr	0.04	0.04	0.00	2.33	0.03	3.38	0.21	0.21	449.36	521.74

	GHG Emission Rate (g/mmbtu)*			
Fuel Type	**CO2**	**CH4**	**N2O**	**CO2e (20 yr GWP)+**
Natural Gas	11,913	384	0.136	44,205

* Emission Rate from NYSDEC guidance document

Natural Gas Used for Boilers*

469,536 mmbtu/yr

* See Combustion calculations - sum of maximum potential natural gas usage

Upstream Emissions (lb/yr)	**CO2**	**CH4**	**N2O**	**CO2e (20 yr GWP)+**
Natural Gas	5,593,582,368	180,301,824	63,857	20,755,838,880

Upstream Emissions (tons/yr)	**CO2**	**CH4**	**N2O**	**CO2e (20 yr GWP)+**
Natural Gas	6,165.77	198.75	0.07	22,879.01

ATTACHMENT D
Greenhouse Gas Offset Calculations

ATTACHMENT D

Calculation of Amount of Biodiesel to offset greenhouse gas emissions

						TPY CO2e
Target to offset:	56,941.01	tons CO2e	=	113,882,028	lb CO2e	Total baseline emissions: 18,414.11
						60% of baseline (40% reduction): 11,048.47
						Post project total facility emissions: 45,110.48
						Upstream increase 22,879.00
						Increase to offset (new total-60% of baseline+upstream): 56,941.01

Lifecycle Greenhouse Gas Emissions for Distillate:

97	kg CO2e/ mmBTU	Source: https://www.epa.gov/fuels-registration-reporting-and-compliance-help/lifecycle-greenhouse-gas-results
140000	BTU/ gallon of distillate	Source: https://www3.epa.gov/ttn/chief/ap42/appendix/appa.pdf

13.58 kg CO2e/ gallon of distillate
29.876 lb CO2e/ gallon of distillate

Lifecycle Greenhouse Gas Emissions for Biodiesel:

Assume 20% credit ("renewable fuel") :

23.9008 lb CO2e/ gallon of biodiesel*
*(lb CO2e/gallon of distillate x 80%)

Difference in CO2e per gallon between distillate and biodiesel: 5.9752 lb CO2e/ gallon*
*(29.876 lb CO2e/gallon of distillate - 23.9008 lb CO2e/gallon of biodiesel)

Gallons of Biodiesel to offset target CO2e emissions:

19,059,115.68 gallons of biodiesel*
*(113,882,028 lb CO2e target to offset / 5.9752 lb CO2e difference in CO2e per gallon between distillate and biodiesel)

Example comparison to illustrate the offset:

Scenario 1 - Diesel Only Emissions, No Biodiesel

100,000,000	gallons diesel assumed for example	
2,987,600,000	lb CO2e	(100000000 gallons * 29.876 lb CO2e/gallon distillate)
1,493,800	tons CO2e	

Scenario 2 - With Biodiesel Offset

80,940,884	gallons distillate	(gals diesel assumed for example - gals biodiesel to offset increase in CO2e)
19,059,116	gallons biodiesel needed to offset increase in CO2e	
2,873,717,972	lb CO2e total	(29.876 * 80,940,884 + 23.9008 * 19,059,116)
1,436,859	tons CO2e	(lb/2000)