COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southeast Regional Office
December 19, 2024
484.250.5920

Subject: Technical Review Memo
Renewal of Title V Operating Permit No. 23-00119
APS ID 823642, Auth ID 1508601, PF ID 757998
Energy Transfer Marketing & Terminals, L.P.—Marcus Hook Terminal
100 Green Street
Marcus Hook, PA 19061

To: James D. Rebarchak
Environmental Program Manager
Air Quality Program
Southeast Region

From: David S. Smith, E.I.T.
Air Quality Engineering Specialist
Facilities Permitting Section
Air Quality Program

Through: Janine Tulloch-Reid, P.E.
Environmental Engineer Manager
Facilities Permitting Section
Air Quality Program

I. Introduction/Facility Description

Energy Transfer Marketing & Terminals, L.P. (ETMT), owns and operates the Marcus Hook Terminal (MHT), its natural gas liquids (NGLs) processing, storage, and distribution and petroleum terminal facility located in Marcus Hook Borough, Delaware County. ETMT operates the MHT under Title V Operating Permit (TVOP) No. 23-00119 and Plan Approval Nos. 23-0119J and 23-0119K. The purpose of this authorization is to renew the TVOP.

Using the *Pennsylvania Environmental Justice Mapping and Screening Tool* (*PennEnviroScreen*),[1] in accordance with Appendix B of the Department of Environmental Protection's (DEP's) Interim Final Environmental Justice Policy (Document No. 015-0501-002), effective September 16, 2023, the facility is located within an Environmental Justice (EJ) area. In accordance with Appendix C of this policy, DEP has determined that the TVOP renewal warrants special consideration as an Opt-In Permit subject to enhanced public participation.

II. Relevant Facility Permitting History (Since DEP Issued the Previous TVOP Renewal)

A. Previously-Issued TVOPs and Plan Approval No. 23-0119E (revised)

On March 15, 2024, DEP issued a significant modification to the TVOP to establish Reasonably Available Control Technology (RACT) requirements and emission restrictions, pursuant to 25 Pa. Code §§ 129.111–129.115, for various sources at the MHT that commenced operation on or before August 3, 2018, to address

[1] *PennEnviroScreen* can be found on DEP's Public Participation Environmental Justice webpage at the following link: https://gis.dep.pa.gov/PennEnviroScreen.

the 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS) (also referred to as "RACT III"). In addition, DEP incorporated the requirements of Plan Approval Nos. 23-0119E (revised) and 23-0119J into the TVOP by reference.

On August 12, 2024, DEP amended the TVOP to incorporate the terms and conditions of Plan Approval Nos. 23-0119E (revised) and 23-0119K (the latter by reference). In addition, DEP updated the leak detection and repair (LDAR) requirements for the NGLs-related piping and fugitive emissions components at the MHT (in both volatile organic compound (VOC) and greenhouse gas (GHG) service) to those specified in Plan Approval No. 23-0119K. This authorization is for the current TVOP, and all relevant permitting history pertaining to the TVOP and Plan Approval No. 23-0119E (revised) since DEP issued the previous TVOP renewal is detailed in the *Relevant Facility Permitting History* section of DEP's associated technical review memo, dated August 9, 2024 (*Attachment #1*). (It bears mentioning that the present technical review memo only addresses updates to the TVOP subsequent to this authorization.)

B. Plan Approval No. 23-0119J

On February 7, 2024, DEP extended Plan Approval No. 23-0119J for the continued installation and (subsequent) temporary operation of sources and equipment to expand the ethane chilling capacity at the MHT by approximately 140,000 barrels per day. Outside of its incorporation by reference into the TVOP, all permitting history pertaining to Plan Approval No. 23-0119J is detailed in the *Relevant Facility Permitting History* section of DEP's associated technical review memo, dated February 6, 2024 (*Attachment #2*).

C. Plan Approval No. 23-0119K

On April 18, 2024, DEP issued Plan Approval No. 23-0119K for the installation and temporary operation of equipment to expand the ethane chilling capacity at the MHT by approximately 10,000 barrels per day. In addition, DEP addressed Prevention of Significant Deterioration of Air Quality (PSD) and New Source Review (NSR) requirements for the NGLs-related sources and equipment at the MHT, including updating the LDAR requirements for the piping and fugitive emissions components to meet the most stringent requirements incorporated into permits at other facilities, as follows:

- In VOC service: The Texas Commission on Environmental Quality's (TCEQ's) most stringent LDAR program, 28LAER.
- In GHG service: Auditory, visual, and/or olfactory (AVO) inspections on a daily basis.

[Note: Additional information on Plan Approval No. 23-0119K is included in DEP's associated technical review memo, dated April 18, 2024 (*Attachment #3*).]

D. Request for Determination of Requirement for Plan Approval/Operating Permit (RFD) No. 10816

On August 16, 2024, DEP approved the installation of the following equipment under RFD No. 10816:

- New piping and fugitive emissions components for the existing 15-2B rail loading and unloading rack at the MHT.
- New process equipment, piping, and fugitive emissions components after the exit of existing cavern no. 2 (of Source ID 105) at the MHT.

III. TVOP Renewal Application

On July 30, 2024, DEP received an electronic TVOP renewal application package from ETMT via e-mail. The TVOP renewal application package included the TVOP renewal application [25 Pa. Code §§ 127.411(a)(1)–(6) and 127.503(1)–(6) and (8)], the compliance review form [25 Pa. Code §§ 127.411(a)(12) and 127.412(b)], and copies and proofs of the notifications to the municipality and county [71 P.S. § 510-5 (Act 14 of 1984); 25 Pa. Code §§ 127.411(a)(9) and 127.413]. All applicable sections of the TVOP renewal application were completed.

On July 31, 2024, DEP received from ETMT monies for the application fee of $4,000 [25 Pa. Code § 127.704(b)(2)(ii)].

Therefore, DEP considers the TVOP renewal application administratively complete [25 Pa. Code § 127.421(a)] as of the latter date. Since DEP received a complete TVOP renewal application package between 6 and 18 months prior to April 1, 2025, the expiration date of the previously-amended (i.e., current) TVOP, the TVOP renewal application is considered timely [25 Pa. Code § 127.446(e)]. (Consequently, in case DEP is not able to issue the TVOP renewal by the expiration date of the previously-amended TVOP, ETMT would be permitted to operate the MHT under an application shield [25 Pa. Code §§ 127.403(b) and 127.446(c)]. This is based on the facts that the TVOP application is considered timely and administratively complete and that ETMT does not have any past due annual Title V emission fees [25 Pa. Code § 127.705(b)] or annual operating permit maintenance fees [25 Pa. Code § 127.704(d)(2)].)

IV. Physical Changes at the MHT

Since DEP amended the TVOP in August 2024, ETMT has not modified any existing sources or installed any new sources at the MHT. The only physical changes that have occurred at the MHT over this period are grading and the installation of foundations and additional piles for the refrigerated ethane storage tanks (Source IDs 124–125) approved under Plan Approval No. 23-0119J. In addition, ETMT has stated in the TVOP renewal application that 27 storage tanks listed in the current TVOP (as specified in the *Changes to the TVOP* section, below) are permanently out of service (i.e., have been either dismantled and removed or cleaned out and permanently closed off).

V. Changes to the TVOP

The following significant changes have been reflected in the proposed TVOP renewal:

- Many of the source names in the previously-amended TVOP have been updated for consistency and/or clarification purposes.
- Permit maps and respective fugitive emission points (Source IDs Z105 and Z367) have been added for the caverns (Source ID 105) and Tank 367 (Source ID 367).
- The following tanks have been removed (i.e., not included in the proposed TVOP renewal): Tank 344 (Source ID 146); Tank 524 (Source ID 177); Tank 528 (Source ID 179); Tank 529 (Source ID 180); Tank 594 (Source ID 182); Tank 3 (Source ID 202); Tank 638 (Source ID 225); Tanks 5, 18, 20, 25, 200, 202, 204, 205, 207, 209, 213, 247, 265, 339, 343, 347, 861, 870, and V-13 (all under Source ID 300); and Tank 2 (Source ID 302).
- Requirements pertaining to secondary seals have been added to Condition #s 002 and 013, Section D (under Source ID T002), of the previously-amended TVOP (same condition numbers in the TVOP renewal).

VI. Emissions Analysis

Based solely on the potentials to emit (PTEs) for the NGLs-related sources and equipment at the MHT, as listed in Table 9 of DEP's technical review memo for Plan Approval No. 23-0119K, dated April 18, 2024 (*Attachment #3*), the MHT is an existing "major facility," as the term is defined in 25 Pa. Code § 121.1, for carbon monoxide (CO), nitrogen oxides (NO_x), and VOCs. From these, the main sources of CO, NO_x, and VOCs are as follows:

- CO and NO_x: The auxiliary boilers (Source IDs 031 and 033–034) and cold flares (Source IDs C01–C02 and C04).

- VOCs: The NGLs-related fugitive emissions components, the cooling towers (Source IDs 112 and 139), the light naphtha storage tanks (Source IDs 133, 136, 178, and 204), the natural gasoline storage tanks (Source IDs 188, 190, 192, and 212), and the existing cold flares (Source IDs C01–C02).

The PTEs for the non-NGLs-related sources at the MHT do not result in the MHT being a major facility for any other pollutants. From these, the following are also main sources of CO, NO_x, and VOC emissions:

- CO: The warm flare (Source ID C03).
- NO_x: The diesel engine pumps (Source ID 113) and warm flare (Source ID C03).
- VOCs: The non-NGLs-related fugitive emissions components and petroleum liquids storage tanks.

ETMT has reported the following actual emissions from the MHT for calendar year 2023:

- CO: 49.02 *tons/yr*
- Greenhouse gases (GHGs) [CO_2e]: 159,536 *tons/yr*
- Lead: 0.008 *tons/yr*
- NO_x: 57.00 *tons/yr*
- Particulate Matter (PM)/PM less than 10 µm in aerodynamic diameter (PM_{10}): 3.01 *tons/yr*
- PM less than 2.5 µm in aerodynamic diameter ($PM_{2.5}$): 2.39 *tons/yr*
- Sulfur oxides (SO_x): 0.49 *tons/yr*
- VOCs: 140.02 *tons/yr*

VII. Regulatory Analysis

The sources and equipment at the MHT are subject to the provisions of various New Source Performance Standard (NSPS) [40 CFR Part 60] and Maximum Achievable Control Technology (MACT) [40 CFR Part 63] standards, as follows:

A. NSPS

- General Provisions [§ 60.18(c)–(f)]: The cold and warm flares (Source IDs C01–C04).
- Industrial-Commercial-Institutional Steam Generating Units [Subpart Db]: The auxiliary boilers (Source IDs 031 and 033–034).
- Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, and on or Before October 4, 2023 [Subpart Kb]: The existing refrigerated (Source IDs 101–102 and 117–120), all internal floating roof (Source IDs 121, 128, 130, 132, 133, 134, 136, 148–151, 178, 188, 190, 192, 204, 212, and 357–358), all external floating roof (Source IDs 122–123), and two fixed roof (Source ID 300) storage tanks.

- Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After October 4, 2023 [Subpart Kc]: The refrigerated ethane storage tanks (Source IDs 124–125) approved to be installed under Plan Approval No. 23-0119J.[2]

- Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006 [Subpart VV]: The non-NGLs-related fugitive emissions components in VOC service.

- Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006, and on or Before April 25, 2023 [Subpart VVa]: The existing NGLs-related fugitive emissions components in VOC service.

- Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After April 25, 2023 [Subpart VVb]: The NGLs-related fugitive emissions components in VOC service approved to be installed under Plan Approval Nos. 23-0119J and 23-0119K.[3]

- Stationary Compression Ignition Internal Combustion Engines [Subpart IIII]: The emergency generator set (Source ID 404) and four fire pumps (Source ID 405).

B. MACT

- Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations) [Subpart R]: Eleven internal floating roof (Source IDs 121, 128, 130, 133, 134, 136, 148–151, and 212) and two fixed roof (Source ID 300) storage tanks.

- Marine Tank Vessel Loading Operations [Subpart Y]: Non-refrigerated marine vessel loading (Source ID 115).

- Organic Liquids Distribution (Non-Gasoline) [Subpart EEEE]: Two internal floating roof storage tanks (Source IDs 178 and 190).

- Stationary Reciprocating Internal Combustion Engines [Subpart ZZZZ]: The diesel engine pumps (Source ID 113) and two fire pumps (Source ID 403).

- Industrial, Commercial, and Institutional Boilers and Process Heaters [Subpart DDDDD]: The auxiliary boilers (Source IDs 031 and 033–034).

The updated LDAR requirements for the NGL-related fugitive emissions components in VOC service, as discussed in Sub-section C. of the *Relevant Facility Permitting History (Since DEP Issued the Previous TVOP Renewal)* section, above, apply to roughly 80% of the total fugitive emissions components in VOC service at the MHT.

VIII. Information on Public Comment Period and Public Hearing

On January 4, 2025, a public comment period will begin for the submission of written comments, suggestions, objections, or other information regarding the proposed TVOP renewal.

---

[2] DEP intends to modify Plan Approval No. 23-0119J to update the applicable federal requirements for the refrigerated ethane storage tanks approved under the Plan Approval at the time of/concurrent with the next extension. If either/both refrigerated ethane storage tanks commence operation before this occurs, ETMT is still required to comply with the applicable federal requirements (as stated on the cover page of the Plan Approval: "Nothing in this plan approval relieves the permittee from its obligations to comply with all applicable Federal, State and Local laws and regulations.").

[3] DEP intends to open Plan Approval No. 23-0119K for cause to update the applicable federal requirements, as directed by EPA.

Pursuant to 25 Pa. Code § 127.428, DEP will hold a public hearing on Tuesday, February 11, 2025 (or snow date of Tuesday, February 18, 2025), at the Curt Weldon Community Center, 7 West Delaware Avenue, Marcus Hook, PA 19061, from 6:00 PM–8:00 PM. The public hearing will be held to receive oral and written testimony regarding DEP's intent to renew the proposed TVOP renewal.

Pursuant to 25 Pa. Code § 127.429, persons unable to attend the public hearing may submit written statements and exhibits to DEP, in the same manner as specified above, within 10 days after the public hearing. Therefore, the public comment period will remain open through February 21, 2025 (or through February 28, 2025, if the public hearing is held on the snow date).

IX. Recommendation

Based on a review of the previously-amended TVOP, Plan Approval Nos. 23-0119J and 23-0119K, and the TVOP renewal application, I recommend that DEP renew the TVOP for ETMT for the MHT, as indicated above.

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southeast Regional Office
August 9, 2024
484.250.5920

Subject: Technical Review Memo
Administrative Amendment to Title V Operating Permit No. 23-00119
APS ID 823642, Auth ID 1488857, PF ID 757998
Energy Transfer Marketing & Terminals, L.P.—Marcus Hook Terminal
100 Green Street
Marcus Hook, PA 19061

To: James D. Rebarchak 8/12/2024
Environmental Program Manager
Air Quality Program
Southeast Region

From: David S. Smith, E.I.T. DSS 8/9/24
Air Quality Engineering Specialist
Facilities Permitting Section
Air Quality Program

Through: Janine Tulloch-Reid, P.E. JET 8/12/2024
Environmental Engineer Manager
Facilities Permitting Section
Air Quality Program

I. Introduction/Facility Description

Energy Transfer Marketing & Terminals, L.P. (ETMT), owns and operates the Marcus Hook Terminal (MHT), its petroleum terminal and natural gas liquids (NGLs) processing, storage, and distribution facility located in Marcus Hook Borough, Delaware County. ETMT operates the MHT under Title V Operating Permit (TVOP) No. 23-00119 and Plan Approval Nos. 23-0119E (revised), 23-0119J, and 23-0119K. The purpose of this authorization is to amend the TVOP to incorporate the requirements of Plan Approval No. 23-0119E (revised), in accordance with 25 Pa. Code § 127.450(a)(5). In addition, the Department of Environmental Protection (DEP) has incorporated the requirements of Plan Approval No. 23-0119K into the amended TVOP by reference.

II. Relevant Facility Permitting History

On March 2, 2015, DEP issued the TVOP to Sunoco Partners Marketing & Terminals, L.P. (SPMT), for the Marcus Hook Industrial Complex (MHIC).

On April 1, 2016, DEP issued Plan Approval No. 23-0119E to SPMT for the following:

- The redesign/modification and use of three existing fractionation towers at the MHIC, as follows, and associated equipment for the fractionation of propane/butane (transmix) and deethanized natural gas liquid feedstocks:
  - Two fractionation towers (15-2B T-4 [Source ID 091] and 15-2S T-4 [Source ID 090]) to operate as depropanizers for fractionation into propane and heavier hydrocarbons.

    - A fractionation tower (15-2B T-2 [Source ID 092]) to operate as a debutanizer for fractionation of the heavier hydrocarbons from the depropanizers into butane and natural gasoline.
- The installation of the following equipment:
    - Meter provers.
    - Additional piping and components, including a flare header, from the fractionation towers and meter provers to an existing elevated flare at the MHIC.
- The associated use of existing refrigerated storage tanks, internal floating roof storage tanks, and caverns at the MHIC.
- The associated use of utilities (i.e., steam and cooling water) from existing auxiliary boilers and a cooling tower, respectively, at the MHIC.
- The routing of flows from the fractionation towers, meter provers, and caverns to the aforementioned elevated flare.

On April 29, 2016, Clean Air Council (CAC) appealed Plan Approval No. 23-0119E to the Environmental Hearing Board (EHB), arguing, among other things, that DEP erred in considering the sources and equipment permitted under the Plan Approval as a stand-alone project (i.e., versus as a larger project with the other sources and equipment related to NGLs processing, storage, and distribution at the MHIC that were previously permitted or authorized under other Plan Approvals or Requests for Determination of Changes of Minor Significance and Exemption from Plan Approval/Operating Permit [RFDs]).

On March 28, 2017, DEP modified Plan Approval No. 23-0119E to memorialize SPMT obtaining and surrendering nitrogen oxides (NO_x) and volatile organic compound (VOC) emission reduction credits (ERCs) to offset the NO_x and VOC emission increases for the sources and equipment permitted under the Plan Approval.

On October 6, 2017, DEP extended Plan Approval No. 23-0119E for the following:

- The commencement of operation and continued temporary operation of existing fractionation towers 15-2B T-4 and 15-2B T-2 at the MHIC to operate as a depropanizer and debutanizer, respectively.
- The shakedown of affected support sources.

On March 23, 2018, DEP extended Plan Approval No. 23-0119E (for a period of 18 months) for the following:

- The commencement of operation and continued temporary operation of existing fractionation towers 15-2B T-4 and 15-2B T-2 at the MHIC to operate as a depropanizer and debutanizer, respectively, which had not occurred since the previous Plan Approval extension request.
- The redesign/modification of existing fractionation tower 15-2S T-4 at the MHIC to operate as a depropanizer, which was delayed due to market conditions.

On January 9, 2019, the EHB remanded Plan Approval No. 23-0119E to DEP for the reevaluation of all past and future authorizations for sources and equipment related to the NGLs processing, storage, and distribution operations at the MHT as a single aggregated project to determine the applicability of Prevention of Significant Deterioration of Air Quality (PSD) and New Source Review (NSR) requirements.

On September 25, 2019, DEP extended Plan Approval No. 23-0119E (for a period of 18 months) for the following:

- The continued temporary operation of existing fractionation towers 15-2B T-4 and 15-2B T-2 at the MHIC to operate as a depropanizer and debutanizer, respectively, pending final resolution of the remand of the Plan Approval.
- The resumption and completion of the redesign/modification of existing fractionation tower 15-2S T-4 to operate as a depropanizer, which was delayed due to market conditions.

On March 31, 2020, DEP renewed the TVOP.

On February 12, 2021, DEP issued Plan Approval No. 23-0119E (revised) to SPMT. In addition to the sources and equipment permitted under the original Plan Approval No. 23-0119E, the revised version included all sources and equipment related to NGLs processing, storage, and distribution at the MHIC that were previously permitted under other Plan Approvals (i.e., three auxiliary boilers, eight refrigerated storage tanks, piping and components, marine vessel loading equipment, four caverns, an additional fractionation tower, a natural gasoline loading rack, three cooling towers, eight internal floating roof storage tanks, and two elevated cold flares). Moreover, Plan Approval No. 23-0119E (revised) required the installation of the following additional control devices:

- A secondary seal on one of the internal floating roof storage tanks (i.e., Source ID 190).
- High-efficiency drift eliminators on one of the cooling towers (i.e., Source ID 139).

On August 18, 2021, DEP extended Plan Approval No. 23-0119E (revised) (for a period of 18 months) for the following:

- The continued temporary operation of all sources and equipment related to NGLs processing, storage, and distribution at the MHIC (that were included in the Plan Approval).
- The completion of installation of the aforementioned control devices.[1]

On March 1, 2022, SPMT changed its company name to ETMT (and also the name of the facility from MHIC to MHT).

On February 15, 2023, DEP extended Plan Approval No. 23-0119E (revised) (for a period of 18 months) for the following:

- The continued temporary operation of all sources and equipment related to NGLs processing, storage, and distribution at the MHT (that were included in the Plan Approval).
- The resumption and completion of the redesign/modification of existing fractionation tower 15-2S T-4 to operate as a depropanizer, which was "delayed due to various challenges and complications related to COVID-19 and market conditions," in accordance with specifications in the application for the original Plan Approval No. 23-0119E and the conditions in Plan Approval No. 23-0119E (revised).

On March 15, 2024, DEP issued a significant modification to the TVOP to establish Reasonably Available Control Technology (RACT) requirements and emission restrictions, pursuant to 25 Pa. Code §§ 129.111–129.115, for various sources at the MHT that commenced operation on or before August 3, 2018, to address the 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS) (also referred to as "RACT III"). In addition, DEP incorporated the requirements of Plan Approval Nos. 23-0119E (revised) and 23-0119J into the TVOP by reference.

[1] ETMT completed installation of the additional control devices required under Plan Approval No. 23-0119E (revised) in June 2022.

On June 14, 2024, DEP received a Request for State Only/Title V Operating Permit Administrative Amendment (Request), along with monies for the application fee of $1,500 [25 Pa. Code § 127.704(b)(5)(ii)], from ETMT, via DEP's Public Upload with Payment tool, to incorporate the requirements of Plan Approval No. 23-0119E (revised) into the TVOP. In the cover letter accompanying the Request, ETMT stated "that Source ID 090: Depropanizer (15-2S T4) was not constructed … [and] can be excluded from the [TVOP]." Since all other sources under Plan Approval No. 23-0119E (revised) are existing and being operated in accordance with the terms and conditions of the Plan Approval, DEP concurs with the Request.

III. Changes to the TVOP

In addition to no longer including existing fractionation tower 15-2S T-4 as a source in the amended TVOP (i.e., Source ID 090), as a result of a U.S. Environmental Protection Agency (EPA) order responding to petitions submitted to EPA by the Sierra Club, Little Blue Regional Action Group, Environmental Integrity Project, Group Against Smog and Pollution, and the Clean Air Council objecting to TVOPs previously issued by DEP for the Homer City and Bruce Mansfield coal-fired electric generating facilities (Nos. 32-00055 and 04-00235, respectively), DEP has incorporated the requirements of Plan Approval No. 23-0119K into the amended TVOP by reference.

In accordance with Condition # 001(a)(1), Section C, of Plan Approval No. 23-0119K, the requirements specified in Section D (under Source ID 103), of the previously-modified TVOP, have been superseded and replaced by the requirements specified in Section D (under Source IDs 400–401 and 501), of the Plan Approval. These requirements are specified in Section D (under Source IDs 400–401 and 501), of the amended TVOP, except that DEP has not incorporated the following conditions from Plan Approval No. 23-0119K:

- Condition # 024(c), Section D (under Source ID 400).
- Condition # 026(c), Section D (under Source ID 401).
- Condition #s 004 and 007(b), Section D (under Source ID 501).

Moreover, DEP has corrected the following:

- The source names for Source IDs C01 and C02 have been corrected to East Cold Flare (Modified) and West Cold Flare (New Tanks Project), respectively.
- The control device efficiency restrictions referenced for the existing refrigerated storage tanks in Condition #s 004(a)(1) and 006(b), Section D (under Source IDs 101–102 and 117–120), of the previously-modified TVOP.
- The monitoring frequency for VOC leaks for the cooling towers in Condition # 003(e), Section D (under Source ID 112), of the previously-modified TVOP (inadvertently not incorporated by reference from Plan Approval No. 23-0119E (revised)).
- The condition reference in Condition # 008(b), Section D (under Source ID 501), of Plan Approval No. 23-0119K (Condition # 007(b), Section D (under Source ID 501), of the amended TVOP).

Lastly, DEP has added control device efficiency restrictions for the East Cold Flare, West Cold Flare, and West Warm Flare as Condition # 002, Section D (under Source IDs C01–C03), of the amended TVOP, respectively (the first two were inadvertently not incorporated by reference from Plan Approval No. 23-0119E (revised), while the second corresponds to the control device efficiency indicated in previous applications).

IV. Recommendation

Based on a review of the previously-modified TVOP and Plan Approval Nos. 23-0119E (revised), 23-0119J, and 23-0119K, I recommend that DEP amend the TVOP for ETMT for the MHT, as indicated above.

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southeast Regional Office
February 6, 2024
484.250.5920

Subject: Technical Review Memo
Extension of Plan Approval No. 23-0119J
APS ID 998548, AUTH ID 1462394, PF ID 757998
Energy Transfer Marketing & Terminals, L.P.—Marcus Hook Terminal
100 Green Street
Marcus Hook, PA 19061

To: James D. Rebarchak 2/7/24
Environmental Program Manager
Air Quality Program
Southeast Region

From: David S. Smith, E.I.T. DSS 2/6/24
Air Quality Engineering Specialist
Facilities Permitting Section
Air Quality Program

Through: Janine Tulloch-Reid, P.E. JET 2/7/2024
Environmental Engineer Manager
Facilities Permitting Section
Air Quality Program

I. Introduction/Purpose of Authorization

Energy Transfer Marketing & Terminals, L.P. (ETMT), owns and operates the Marcus Hook Terminal (MHT), its petroleum terminal and natural gas liquids (NGLs) processing, storage, and distribution facility located in Marcus Hook Borough, Delaware County. The MHT is permitted under Title V Operating Permit (TVOP) No. 23-00119 and Plan Approval Nos. 23-0119E [revised] and 23-0119J. The purpose of this authorization is to extend Plan Approval No. 23-0119J (see *Justification for Plan Approval Extension* section, below, for further discussion).

Using the *Pennsylvania Environmental Justice Mapping and Screening Tool* (*PennEnviroScreen*),[1] in accordance with Appendix B of the Department of Environmental Protection's (DEP's) Interim Final Environmental Justice Policy (Document No. 015-0501-002), effective September 16, 2023, the MHT is located in an Environmental Justice (EJ) area. In accordance with Appendix C of this policy, DEP does not consider the authorization to be a Public Participation Trigger or Opt-In Project. Therefore, DEP does not recommend any additional public participation actions at this time.

[1] *PennEnviroScreen* can be found on DEP's Public Participation EJ webpage at the following link: https://gis.dep.pa.gov/PennEnviroScreen.

Attachment #2

II. Relevant Facility Permitting History

On February 12, 2021, DEP issued Plan Approval No. 23-0119J to Sunoco Partners Marketing & Terminals, L.P. (SPMT),[2] for the following sources, equipment, and operations to enable or accommodate the processing of approximately 140,000 barrels per day of ethane feedstock into, as well as the transient storage onsite and transfer offsite of, refrigerated (liquified) ethane product (hereinafter collectively referred to as "Project Phoenix"):

- The installation and temporary operation of the following sources and equipment to enable the processing of ethane feedstock into refrigerated ethane product:
    - One new amine treatment system to remove excess carbon dioxide [CO_2] from ethane feedstock prior to fractionation.
    - One new dehydration train system to remove water from ethane feedstock prior to fractionation.
    - Two new refrigeration systems, each consisting of a closed-loop propane system followed by an open-loop ethane system, for the cooling of dry ethane.
    - Two new fractionation towers (demethanizers; Source ID 142[3]) and associated equipment for the removal of methane from dry ethane.
    - Two new wet surface air cooling (WSAC) systems (Source ID 141), one associated with each new refrigeration system, to process cooling water for the refrigeration systems.
    - All associated piping and components for the refrigerated ethane process.
- The installation and temporary operation or use of the following utilities to enable or accommodate the processing of ethane feedstock:
    - The installation and temporary operation of one new elevated, air-assisted Project Phoenix Cold Flare (Source ID C04), equipped with high- and low-pressure (HP and LP) cold flare tips, to enable the flaring of refrigerated streams that do not contain water.
    - The use of the existing West Warm Flare (Source ID C03 under the TVOP) to accommodate the flaring of streams from the amine treatment system and dehydration train system.
    - The use of three existing auxiliary boilers (1 and 3–4; Source IDs 031 and 033–034 under the TVOP) to accommodate the steam demand (36,300 *lbs/hr*) for the amine treatment system and dehydration train system.
- The installation and temporary operation of two new 600,000-*bbl* refrigerated ethane storage tanks (Source IDs 124–125) to enable the transient storage of refrigerated ethane product prior to its transfer off-site.
- The use of two existing marine vessel loading docks (1A and 2A; part of Source ID 104 under the TVOP) to accommodate the loading of refrigerated ethane product into marine vessels for transfer off-site.

On May 27, 2022, DEP received an electronic letter from ETMT stating that "construction has not yet commenced on the sources authorized under this Plan Approval [No. 23-0119J] because of various complications due to COVID-19. Due to these complications, ETMT respectfully requests [DEP] to authorize an 18-month commence construction extension to February 12, 2024."

On June 13, 2022, DEP received an e-mail with anticipated construction schedule from ETMT, which included a listing of various project milestones ranging from "March 2023 – Begin detailed engineering design" to

[2] On March 1, 2022, SPMT changed its name to ETMT.

[3] In the original Plan Approval No. 23-0119J, DEP had intended to indicate the demethanizers as sources with this Source ID. DEP has done this in the extended Plan Approval.

"February 2026 – Complete all construction activities and begin system commissioning and startup" (see *Attachment #1*).

On August 4, 2022, ETMT confirmed that it had not entered into any binding agreements or contractual obligations for any of the sources or equipment authorized under Plan Approval No. 23-0119J, which may qualify as commencing construction pursuant to the definition of the term "commence" in 25 Pa. Code § 121.1.

On August 8, 2022, DEP extended the timeframe for ETMT to commence construction on the sources and equipment authorized under Plan Approval No. 23-0119J to February 12, 2024.

On November 20, 2023, DEP received a Plan Approval extension package for Plan Approval No. 23-0119J from ETMT. The Plan Approval extension package included the Plan Approval extension form, the compliance review form [25 Pa. Code §§ 127.12(a)(11) and 127.12a(b)–(c)], and monies for the application fee of $750 [25 Pa. Code § 127.702(i)(2)(ii)].

III. Justification for Plan Approval Extension

ETMT indicated in the cover letter accompanying the Plan Approval extension package that "construction has not yet commenced on the sources authorized under this Plan Approval [No. 23-0119J] and ETMT anticipates commencement of construction could be delayed beyond February 12, 2024 because of changes in the ethane market, which has been impacted by COVID-19, natural gas production forecasts in the Northeast, and regulatory hurdles faced by customers for expansion projects. Construction of the project will commence once the customer off-take agreements have been completed." To this end, ETMT included in the Plan Approval extension package an anticipated construction schedule with the exact same project milestones as previously submitted, except that all the milestone dates were extended out 18 months (i.e., "September 2024 – Begin detailed engineering design" to "August 2027 – Complete all construction activities and begin system commissioning and startup").

On December 7, 2023, DEP met with ETMT to discuss ETMT's plans for Project Phoenix. Based on the facts that construction on the sources and equipment authorized under Plan Approval No. 23-0119J had yet not commenced (over a period of almost 3 years) and DEP no longer considers COVID-19 or any associated impacts to constitute a force majeure, DEP advised ETMT that it was unwilling to extend the Plan Approval if ETMT did not commence construction prior to February 12, 2024, the expiration date of Plan Approval No. 23-0119J.

On January 8, 2024, DEP confirmed in a telephone conversation with ETMT that ETMT intended to commence construction under Plan Approval No. 23-0119J prior to the expiration date and, correspondingly, submit a revised Plan Approval extension package with updated anticipated construction schedule.

To this end, on January 10, 2024, DEP received the revised Plan Approval extension package with updated anticipated construction schedule. ETMT indicated in its cover letter accompanying the revised Plan Approval extension package that it was "planning to begin foundation work for the sources authorized by Plan Approval 23-0119J during the week of January 29, 2024." The rest of the project milestones in the updated anticipated construction schedule ranged from "February 2024 – Finalize detailed engineering design" to "January 2027 – Complete all construction activities and begin system commissioning and startup." In addition, ETMT requested that DEP extend the term of the Plan Approval by 18 months (i.e., until August 12, 2025).

On February 5, 2024, Heather Henry, Air Quality Specialist, DEP, and I met with Kevin Smith, Supervisor–Environmental Compliance, ETMT, at the MHT to verify whether ETMT commenced foundation work and, hence, construction under Plan Approval No. 23-0119J (see *Attachment #2*). Mr. Kevin Smith drove Ms. Henry and I out to the section of the MHT designated for the new sources and equipment of Project Phoenix. There, Ms. Henry and I observed construction equipment, including a pile driver, on-site and twelve piles sticking out of the ground roughly 12 feet above grade. Mr. Kevin Smith stated that the piles were installed between January 30–

February 2, 2024, and are for the foundation of one of the two refrigerated ethane storage tanks authorized under Plan Approval No. 23-0119J (Source IDs 124–125). Moreover, Mr. Kevin Smith stated that:

- The piles were driven down until they reached bedrock.
- The excess length of the piles above grade is not needed for the foundation and will be cut off as waste.
- The remaining piles required for the foundation will be ordered at the appropriate length(s) (i.e., the minimum length(s) required to reach bedrock and minimize the wasting of material) and driven at some point after they are delivered to the MHT.

Therefore, DEP considers ETMT to have commenced construction under Plan Approval No. 23-0119J.

IV. Recommendation

Based on a review of Plan Approval No. 23-0119J and the associated extension package, as well as DEP's verification that ETMT commenced construction under Plan Approval No. 23-0119J, I recommend that DEP extend Plan Approval No. 23-0119J for a period of 18 months.

Smith, David S

From: Garcia, Lisa M <Lisa.Garcia@energytransfer.com>
Sent: Monday, June 13, 2022 7:28 AM
To: Smith, David S
Cc: Rebarchak, James; Tulloch-Reid, Janine; Gallagher, Jillian; Mclemore, Kevin; Henry, Heather; Smith, Kevin W
Subject: RE: [External] Marcus Hook Terminal Plan Approval J Construction Extension Request

Dave,
I apologize for the delayed response to this request. Please see the information below provided by our engineering team and let me know if you need anything else. Thank you.

- March 2023 – Begin detailed engineering design
- June 2023 – Develop packages and start procuring critical equipment
- July 2023 – Begin utility upgrades
- January 2024 – Begin tank construction
- February 2024 – Begin chiller construction
- July 2025 – Energize PDC
- November 2025 – Tank mechanically complete
- February 2026 – Complete all construction activities and begin system commissioning and startup

ENERGY TRANSFER
Moving America's Energy

Lisa M. Garcia, P.E.
Sr. Manager – Engineering
E&C Environmental
Energy Transfer

O: 713.989.7762
C: 210.540.8853

From: Smith, David S <dssmith@pa.gov>
Sent: Friday, May 27, 2022 1:26 PM
To: Garcia, Lisa M <Lisa.Garcia@energytransfer.com>
Cc: Rebarchak, James <jrebarchak@pa.gov>; Tulloch-Reid, Janine <jtullochre@pa.gov>; Gallagher, Jillian <jigallaghe@pa.gov>; Mclemore, Kevin <kmclemore@pa.gov>; Henry, Heather <hehenry@pa.gov>
Subject: RE: [External] Marcus Hook Terminal Plan Approval J Construction Extension Request

Hi Lisa, are you able to provide an updated timeline/schedule for when ETMT anticipates that construction will commence and, if known, be completed for the various sources under Plan Approval No. 23-0119J?

Thanks,
David S. Smith, E.I.T. (he/him/his) | Air Quality Engineering Specialist
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5064 | Fax: 484.250.5921

From: Garcia, Lisa M <Lisa.Garcia@energytransfer.com>
Sent: Friday, May 27, 2022 11:12 AM
To: Smith, David S <dssmith@pa.gov>
Cc: Rebarchak, James <jrebarchak@pa.gov>; Mclemore, Kevin <kmclemore@pa.gov>; Gallagher, Jillian <jigallaghe@pa.gov>; Henry, Heather <hehenry@pa.gov>; Tulloch-Reid, Janine <jtullochre@pa.gov>
Subject: [External] Marcus Hook Terminal Plan Approval J Construction Extension Request

Dave,
Please see the attached Commence Construction Extension Request for Plan Approval 23-0119J for the Marcus Hook Terminal. Please let me know if you have any questions. Thank you.

Lisa M. Garcia, P.E.
Sr. Manager – Engineering
E&C Environmental
Energy Transfer

O: 713.989.7762
C: 210.540.8853

Private and confidential as detailed here. If you cannot access hyperlink, please e-mail sender.

2700-FM-BAQ0023 2/2015
pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

INSPECTION REPORT

Commonwealth of Pennsylvania
Department of Environmental Protection
Air Quality Program

Date(s) of Inspection:	TV ☐ PA ☑ SM ☐ GP ☐ NM ☐ MEGA ☐	Permit #(s):	Expiration Date:	Case #:	PF ID #:
2/5/2024		PA-23-01195	2/12/24		

Company Name:	Municipality:	County:
SUNOCO	MARCUS HOOK	DELAWARE

Plant Name:	Physical Location:	Federal ID — Plant Code #:
SUNOCO MARCUS HOOK	100 GREEN ST	23-3102655-3

Responsible Official:	Mailing Address:
KEVIN SMITH	100 GREEN ST
Title: ENV. COMP. SPECIALIST	MARCUS HOOK PA 19061
Phone #(s): 610-859-1912	

Mark (X) All Inspection Types That Apply To This Inspection:

☐	Full Compliance Evaluation (FCE)	☑	Plan Approval Inspection	☐	File Review (FR)
☐	Operating Permit Inspection (PI)	☐	Initial Permit Inspection (IPI)	☐	Complaint Inspection (CI)
☐	Routine/Partial (RTPT)	☐	Follow-Up Inspection (Ref. Date:_____)	☐	Sample Collection (SC)
☐	Minor Source(s) Inspection (RFD)	☐	Stack Test Observation	☐	Multi-Media Inspection (MM)
☐	Other:	☐	Announced		

Annual Compliance Certification Received: ☐ YES ☐ NO ☐ N/A	Date Received:
AIMS Report Received: ☐ YES ☐ NO ☐ N/A	Date Received:

Mark (X) All Activities That Apply:

☐	File Review	☑	Pre-Inspection Briefing	☑	Exit Interview/Briefing
☑	Pre-Inspection Observations	☐	Check For New/Unreported Sources	☐	Sample(s) Collected
☑	Visible Emissions Observations	☐	Verify Operation of CEMS	☐	Other

Comments/Recommendations: Enforcement since last FCE ☐ Yes ☐ No (If yes, attach summary)

ON THE ABOVE DATE DAVE SMITH & I MET W/ KEVIN SMITH FOR AN UNANNOUNCED PLAN APPROVAL INSPECTION. WE SAW THAT PERMANENT FOUNDATION WORK HAD BEGUN FOR WHAT WILL BE AN ETHANE (REFRIGE.) TANK UNDER PA-23-01195. WE SAW MULTIPLE PILES DRIVEN INTO THE GROUND. K. SMITH TOLD US THAT CONTRACTORS HAD MOBILIZED & WERE ACTIVELY DRIVING THE PILES WE SAW ON JAN 30 THROUGH FEB 2, 2024. DEP HAD RECEIVED A PLAN APPROVAL EXTENSION REQUEST FROM SUNOCO ON JAN 10, 2024 REGARDING PA-23-01195.

Compliance Status: ☑ In ☐ Out ☐ Pending ☐ Awaiting Co. Report	Needs a Follow-Up Inspection? ☐ Yes ☑ No		
Company Representative: Kevin Smith	Title: ENV	Signature:	Date: 11:43 am 2/5/24
DEP Representative: HEATHER HONEY	Title: AQS	Signature:	Date/Time: 11:42 AM 2/5/24

This document is official notification that a representative of the Department of Environmental Protection, Air Quality Program, inspected the identified site. The findings of this inspection are shown above and on any attached pages, and may include violations uncovered during the inspection. Violations may also be discovered upon review of sample results or from any additional review of Department records. Notification will be forthcoming, if such violations are noted.

Page 1 of 1 eFacts Inspection ID#: 3706119 Date: _____ Reviewed By _____

☐ White – Regional Office ☐ Yellow – Site ☐ Pink – District Office

Attachment #2

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southeast Regional Office
April 18, 2024
484.250.5920

Subject: Technical Review Memo
Prevention of Significant Deterioration of Air Quality Plan Approval No. 23-0119K
APS ID 1056774, AUTH ID 1385103, PF ID 757998
Energy Transfer Marketing & Terminals, L.P.—Marcus Hook Terminal
100 Green Street
Marcus Hook, PA 19061

To: James D. Rebarchak 4/18/2024
Environmental Program Manager
Air Quality Program
Southeast Region

From: David S. Smith, E.I.T. DSS 4/18/24
Air Quality Engineering Specialist
Facilities Permitting Section
Air Quality Program

Through: Janine Tulloch-Reid, P.E. JET 4/18/2024
Environmental Engineer Manager
Facilities Permitting Section
Air Quality Program

I. Introduction/Purpose of Authorization

Energy Transfer Marketing & Terminals, L.P. (ETMT), owns and operates the Marcus Hook Terminal (MHT), its natural gas liquids (NGLs) processing, storage, and distribution facility located in Marcus Hook Borough, Delaware County. ETMT operates the MHT under Title V Operating Permit (TVOP) No. 23-00119 and Plan Approval Nos. 23-0119E (revised) and 23-0119J. The MHT is an existing major facility for Prevention of Significant Deterioration of Air Quality (PSD) and New Source Review (NSR) purposes (see the *PSD Analysis* and *NSR Analysis* sections, below, for further discussion). The purpose of this authorization is to install and temporarily operate equipment to expand the ethane chilling capacity at the MHT from approximately 75,000 *bbl/day* to approximately 85,000 *bbl/day* (see the *Ethane Chilling Expansion Project Description* section, below, for further discussion).

In accordance with the Pennsylvania Department of Environmental Protection's (DEP's) Environmental Justice (EJ) Public Participation Policy (Document No. 012-0501-002), effective April 24, 2004, and based on 2015 data from the United States Census Bureau, the MHT is located within an EJ Community.

II. Relevant Facility Permitting History

[Note: See the *Single Aggregated Project Description* section of DEP's technical review memo for Plan Approval No. 23-0119E (revised), dated February 5, 2021, for a comprehensive listing of all authorizations related to the NGLs processing, storage, and distribution operations at the MHT that DEP issued or approved from 2013–2020, including Sub-section H pertaining to (the original) Plan Approval No. 23-0119E.]

Attachment #3

On April 29, 2016, Clean Air Council (CAC) appealed (the original) Plan Approval No. 23-0119E to the Environmental Hearing Board (EHB; under Docket No. 2016-073-L), arguing, among other things, that DEP erred in considering the sources and equipment permitted under (the original) Plan Approval No. 23-0119E as a stand-alone project (i.e., versus as a larger project with the other sources and equipment related to the NGLs processing, storage, and distribution operations at the MHT that DEP permitted or authorized up to that point).

On January 9, 2019, Judge Bernard A. Labuskes, Jr., of the EHB, remanded Plan Approval No. 23-0119E to DEP for the reevaluation of all past and future authorizations for sources and equipment related to the NGLs processing, storage, and distribution operations at the MHT as a single aggregated project to determine the applicability of PSD and NSR requirements.

On February 12, 2021, DEP concurrently issued Plan Approval No. 23 0119J to Sunoco Partners Marketing & Terminals, L.P. (SPMT) for Project Phoenix (see the Project Phoenix Description section of DEP's technical review memo for Plan Approval No. 23-0119J, dated February 5, 2021, for further discussion) and Plan Approval No. 23-0119E (revised) to SPMT for the single aggregated project.

On May 13, 2021, DEP approved Request for Determination of Changes of Minor Significance and Exemption from Plan Approval/Operating Permit (RFD) No. 9156 for the installation of new flare connections and associated fugitive components for four propane and three butane loading and unloading stations (i.e., fourteen total stations) at the existing H5 truck rack. (Each loading and unloading station includes an operational connection to the West Warm Flare (Source ID C03) installed under Plan Approval No. 23-0119H and permitted under the TVOP instead of venting uncontrolled VOCs from disconnections to the outdoor atmosphere.)

On May 19, 2021, SPMT notified DEP of a de minimis emissions increase relating to the replacement of two 50 P 206C ethane recycle pumps with a new design that has its casings vented (of ethane vapor during operational (i.e., startup) and maintenance activities) to the East Cold Flare (Source ID C01)[1] permitted under the TVOP and Plan Approval No. 23-0119E (revised).

On September 3, 2021, DEP approved RFD No. 9332 for the installation of a new butane truck loading station and associated fugitive components for the H5 truck rack. (As with the equipment authorized under RFD No. 9156, the new equipment includes an operational connection to the West Warm Flare.)

On January 4, 2022, SPMT notified DEP of a de minimis emissions increase1 relating to the installation of new YZ light liquid sampler systems and associated fugitive components for the product rerun lines of the depropanizer and debutanizer (Source IDs 091 and 092, respectively) installed under (the original) Plan Approval No. 23-0119E and permitted under the TVOP and Plan Approval No. 23-0119E (revised). (Each sampling system includes an operational connection to the West Warm Flare.)

III. PSD Plan Approval Application Package Submittal and Updates

On February 14, 2022, DEP received an electronic PSD Plan Approval application package from Environmental Resources Management (ERM), on behalf of SPMT, for the installation and temporary operation of equipment to expand the ethane chilling capacity at the MHT. The PSD Plan Approval application package included the Plan Approval application, general information form (GIF), compliance review form [25 Pa. Code § 127.12(a)(11)], and copies of the notifications to the municipality and county [71 P.S. § 510-5 (Act 14 of 1984); 25 Pa. Code

[1] To date, Source IDs C01and C02 have been indicated in previous authorizations for SPMT/ETMT, beginning with Plan Approval Nos. 23-0119 and 23-0119D, respectively, as the "West Cold Flare" and "East Cold Flare," respectively. However, ETMT provided a comment on the draft version of Plan Approval No. 23-0119K indicating that the cardinal directions in the source names are transposed. Accordingly, DEP has corrected the source names for Source IDs C01 and C02 referenced throughout Plan Approval No. 23-0119K and this technical review memo, and will do the same for the TVOP and Plan Approval No. 23-0119E (revised) at the time of the next renewal, administrative amendment, minor modification, or extension, as applicable.

§§ 127.12(a)(8) and 127.43a]. All applicable sections of the PSD Plan Approval application were completed. However, DEP was not able to access the air dispersion modeling files SPMT included with the PSD Plan Approval application, which are reviewed by DEP's Air Quality Modeling Section.

On February 15, 2022, ERM, on behalf of SPMT, resubmitted the air dispersion modeling files in a format that DEP was able to access.

On February 16, 2022, DEP received monies of $42,500 for the PSD Plan Approval application fees [25 Pa. Code § 127.702(a)], as follows:

- A fee of $2,500 for the base Plan Approval application [25 Pa. Code § 127.702(b)(2)].
- A fee of $2,500 for each applicable New Source Performance Standard (NSPS) [40 CFR Part 60], National Emission Standard for Hazardous Air Pollutants (NESHAP) [40 CFR Part 61], or Maximum Achievable Control Technology (MACT) [40 CFR Part 63] standard, up to a maximum of three standards [25 Pa. Code § 127.702(d)(2)]. The various sources and equipment related to the NGLs processing, storage, and distribution operations at the MHT are subject to NSPS Subparts Db, Kb, VV, and VVa; and MACT Subparts Y and DDDDD. Therefore, the fee is capped at $7,500.
- A fee of $32,500 for a source(s) subject to PSD requirements [25 Pa. Code § 127.702(f)(2)].

On March 1, 2022, DEP received proofs of receipt for the notifications to the municipality and county made in accordance with 71 P.S. § 510-5 (Act 14 of 1984) and 25 Pa. Code § 127.43a.

On March 4, 2022, DEP's Air Quality Modeling Section considered the Air Quality Modeling Report included with the PSD Plan Approval application to be administratively complete.

On March 9, 2022, DEP received Change of Ownership and Compliance Review forms indicating that, effective March 1, 2022, SPMT changed its company name to ETMT. [Note: Hereinafter, DEP refers to the company as ETMT, even when discussing authorizations or events that occurred prior to March 1, 2022.]

Also on March 9, 2022, DEP received additional information from ERM, on behalf of ETMT, pertaining to the design and plant layout of the ethane chiller train and boil-off gas (BOG) system proposed to be installed as part of the expansion.

Therefore, DEP considers the entire PSD Plan Approval application administratively complete as of the latest date [25 Pa. Code § 127.12d(b)]. Coordination with other programs is not required.

On June 8, 2022, DEP hosted an informational meeting in Marcus Hook Borough, in which DEP gave a presentation on the permit review process for the PSD Plan Approval application and answered related questions from the public. In addition, representatives from ETMT gave a presentation on the Ethane Chilling Expansion Project and answered related questions from the public.

On August 12, 2022, DEP's Air Quality Modeling Section submitted to ETMT its comments on the Air Quality Modeling Report included with the PSD Plan Approval application.

On February 27, 2023, ERM, on behalf of ETMT, submitted a response to the comments from DEP's Air Quality Modeling Section, along with a revised Air Quality Modeling Report and air dispersion modeling.

On March 10, 2023, DEP requested additional information from ETMT in order to complete the technical review of the PSD Plan Approval application.

On March 31, 2023, ERM, on behalf of ETMT, submitted an addendum to the PSD Plan Approval application.

On April 3, 2023, ERM, on behalf of ETMT, submitted additional information requested by DEP for the PSD Plan Approval application.

Due to the long lead time involved with the construction and shakedown of the equipment of the Ethane Chilling Expansion Project, ETMT has requested that DEP issue the initial Plan Approval for a term of 36 months. To this end, DEP requested that ETMT provide an updated construction timeline justifying the extended timeframe. On June 21, 2023, ETMT provided the requested construction timeline (see *Attachment #1*). DEP consents to ETMT's request.

IV. Ethane Chilling Expansion Project Description

ETMT has proposed to expand the ethane chilling capacity at the MHT from approximately 75,000 *bbl/day* to approximately 85,000 *bbl/day*. To this end, ETMT has proposed the following (hereinafter collectively referred to as the "Ethane Chilling Expansion Project"):

- The installation of the following ethane chilling process equipment:
  - A new (fourth) ethane chiller train, consisting of a mixed refrigerant (MR) liquid compressor and heat exchanger, ethane chiller, and related equipment, in parallel with the three ethane chiller trains installed under Plan Approval Nos. 23-0119A and 23-0119D.
  - A new BOG system, consisting of a compressor, chiller, and related equipment.
  - New piping, fugitive emissions components, and process vents associated with the new ethane chiller train and BOG system.
  - Updated piping and fugitive emissions components for certain ethane chilling process equipment installed under Plan Approval Nos. 23-0119A and 23-0119D (i.e., the feed metering, feed heating, amine treatment, and demethanizer off-gas systems).
- Operational, maintenance, and emergency connections from the new ethane chiller train to the East Cold Flare (Source ID C01) installed under Plan Approval No. 23-0119 and permitted under the TVOP and Plan Approval No. 23-0119E (revised).
- Operational, maintenance, and emergency connections from the new BOG system to the Project Phoenix Cold Flare (Source ID C04) authorized under Plan Approval No. 23-0119J.
- Additional steam demand (~23,673 *lbs/hr*) on the three existing auxiliary boilers (1 and 3–4; Source IDs 031 and 033–034) permitted under the TVOP and Plan Approval No. 23-0119E (revised) by certain ethane chilling process equipment installed under Plan Approval Nos. 23-0119A and 23-0119D (i.e., the dehydrators and water/ethylene glycol (WEG) system utility), as well as for maintenance purposes, to support the additional ethane throughput through new and existing ethane chilling process equipment.[2]

[2] During a July 17, 2023, telephone conversation with DEP, Mr. Kevin W. Smith, Senior Specialist (now Supervisor) – Environmental Compliance, ETMT, confirmed the ethane chilling process equipment and utilities requiring steam from the auxiliary boilers.

- With the Ethane Chilling Expansion Project, ETMT has not proposed to alter the general ethane chilling process at the MHT[3] or add any new stand-alone sources. However, the new ethane chiller train and BOG system, and previously-installed feed metering, feed heating, amine treatment, and demethanizer off-gas systems, are proposed to include new piping and fugitive emissions components, including valves, pump seals, compressor seals, pressure relief valves, flanges/connectors, and an open-ended line, that are expected to result in emissions increases of greenhouse gases (GHGs) and volatile organic compounds (VOCs) (see the *PSD Analysis* and *NSR Analysis* sections, below, for further discussion). Based on the preliminary engineering design, ETMT has conservatively estimated the fugitive emissions component count for the Ethane Chilling Expansion Project (see *Attachment #2*).

Similarly, the new ethane chiller train and BOG system are proposed to include new process vent connections to the East Cold Flare and Project Phoenix Cold Flare, respectively, that are expected to result in incremental emissions increases of carbon monoxide [CO], GHG, nitrogen oxides [NO_x],[4] sulfur dioxide [SO_2], and VOCs (see the *PSD Analysis* and *NSR Analysis* sections, below, for further discussion).

[3] The general ethane chilling process at the MHT consists of the following steps (in order):

- The delivery of ethane feedstock to the MHT via pipeline.
- The metering, heating, and filtering of the ethane feedstock prior to any processing.
- The removal of carbon dioxide [CO_2] from the ethane feedstock via an amine treatment system.
- The removal of sulfur from the ethane feedstock via sulfur treat beds.
- The removal of water from the ethane feedstock via molecular sieve desiccant dehydrators.
- Additional filtering of the ethane feedstock to remove any entrained desiccant beads from the dehydrators.
- The removal of methane [CH_4] from dry ethane via the demethanizer (Source ID 106A) installed under Plan Approval No. 23-0119A and permitted under the TVOP and Plan Approval No. 23-0119E (revised). The methane off-gas from the demethanizer is pulled to the fuel gas system, proceeds to the existing 15-2B gas plant, and is ultimately consumed by the existing auxiliary boilers.
- The chilling of treated, dry ethane via any of the chiller trains.
- The routing of refrigerated ethane to the refrigerated ethane storage tanks (Source IDs 101 and 117) installed under Plan Approval Nos. 23-0119 and 23-0119D, respectively, and permitted under the TVOP and Plan Approval No. 23-0119E (revised). Moreover, upon installation, ETMT may route refrigerated ethane to the refrigerated ethane storage tanks (Source IDs 124–125) authorized under Plan Approval No. 23-0119J. The BOG from the storage tanks is also pulled to the fuel gas system to be consumed by the auxiliary boilers.
- The transfer of refrigerated ethane offsite via the existing marine vessel loading (refrigerated) (Source ID 104) installed under Plan Approval No. 23-0119 and permitted under the TVOP and Plan Approval No. 23-0119E (revised).

[4] All NO_x is expressed as nitrogen dioxide [NO_2].

Based on the preliminary engineering design with a margin of 20%,[5] ETMT has conservatively estimated the expected incremental process vent flows from the new ethane chiller train and BOG system to the East Cold Flare and Project Phoenix Cold Flare, respectively. These process vent flows are listed in Tables 1 and 2, below:

Table 1
Expected Incremental Process Vent Flows from the New Ethane Chiller Train to the East Cold Flare (*lbs/yr*)

Flare Tip	Flow Type(s)[6]	Methane	Ethane	Propane	Pentane	**Totals**
High-Pressure	Sweep	190,530	0	0	0	**190,530**
	Operational	0	0	0	0	**0**
	Maintenance	1	4	1	1	**8**
Low-Pressure	Operational	42,815	123,407	45,333	40,296	**251,850**
	Maintenance	0	0	0	0	**0**
	Totals	**233,846**	**123,410**	**45,334**	**40,297**	**442,388**

Table 2
Expected Incremental Process Vent Flows from the New BOG System to the Project Phoenix Cold Flare (*lbs/yr*)

Flare Tip	Flow Type(s)[2]	Methane	Ethane	Propane	Butane	**Totals**
High-Pressure	Operational	2,663	8,516	9,604	97	**20,880**
	Maintenance	5	161	334	3	**503**
	Totals	**2,668**	**8,677**	**9,937**	**101**	**21,383**

V. PSD Analysis

In accordance with the EHB's adjudication decision, DEP has evaluated the Ethane Chilling Expansion Project and all past authorizations for sources and equipment related to the NGLs processing, storage, and distribution operations at the MHT, as indicated in the *Relevant Facility Permitting History* section, above, as a single aggregated project (hereinafter referred to as the "expanded single aggregated project" to avoid confusion with the single aggregated project that DEP previously reevaluated under Plan Approval No. 23-0119E (revised)) to determine the applicability of PSD and NSR requirements.

As indicated in 40 CFR § 52.21(a)(2)(i), the provisions of 40 CFR § 52.21 (incorporated by reference at 25 Pa. Code § 127.83) "apply to the construction[7] of any new major stationary source[7] … or any project at an existing major stationary source in an area designated as attainment." As the MHT is an existing major stationary source, in accordance with 40 CFR § 52.21(a)(2)(iv), DEP is required to perform a PSD analysis to determine whether the expanded single aggregated project constitutes a major modification[7] for a regulated NSR pollutant[7] and subject to PSD requirements. The regulated NSR pollutants Delaware County is currently designated as attainment (or

[5] During a July 13, 2023, telephone conversation with DEP, Mr. Smith of ETMT confirmed that the process vent flows included this margin.

[6] ETMT has proposed to introduce an additional 300 standard cubic feet per hour (*scfh*) flow of sweep gas (natural gas) into the header of the East Cold Flare on a continuous basis to prevent explosive conditions within the piping. Operational flows occur on a regular, routine, or continuous basis. Maintenance flows occur at various intervals depending on maintenance and operational schedules and the condition of the respective equipment.

In addition, a purpose of both the East Cold Flare and Project Phoenix Cold Flare is to provide safe and reliable control and destruction of process gases during emergency situations. ETMT has considered emergency flows in the design of both flares.

[7] As the term is defined in 40 CFR § 52.21(b).

maintenance) for and are relevant to the PSD analysis are CO, lead [Pb], NO_2/NO_x,[8] particulate matter [PM], PM less than 10 μm in aerodynamic diameter [PM_{10}], PM less than 2.5 μm in aerodynamic diameter [$PM_{2.5}$], SO_2, and sulfuric acid mist [H_2SO_4]. [Note: For the sake of fully characterizing the emissions increases of all pollutants for the respective authorizations of the expanded single aggregated project in one place, the PSD analysis also includes discussion of VOCs. However, as indicated in Footnote 8, below, these emissions increases are relevant only to the NSR analysis (see the *NSR Analysis* section, below, for further discussion).]

As indicated in 40 CFR § 52.21(a)(2)(iv)(*a*), "a project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases—a significant emissions increase[7] … and a significant[7] net emissions increase.[7] … The project is not a major modification if it does not cause a significant emissions increase. If the project causes a significant emissions increase, then the project is a major modification only if it also results in a significant net emissions increase." In addition, in accordance with 40 CFR § 52.21(b)(49)(iii)–(iv), greenhouse gases (GHGs)[7] are significant and subject to regulation[7] only when a project is already a major modification for a regulated NSR pollutant.

Before beginning the PSD analysis, it is critical to define the project and establish the associated timeframes (i.e., based on the dates that DEP received a complete application, construction actually/is anticipated to commence,[7] and operation actually/is anticipated to commence). DEP has defined the project as the expanded single aggregated project. While establishing the associated timeframes for a project is normally a straightforward exercise, in this case, the actual and anticipated dates for the commencement of construction and operation for the sources and equipment of the expanded single aggregated project range from calendar years 2013–2026. Since DEP previously reevaluated most of the sources and equipment of the expanded single aggregated project under Plan Approval No. 23-0119E (revised) to determine the applicability of PSD and NSR requirements, DEP does not consider it appropriate to reassess or change the emissions increases previously determined for these sources and equipment or, consequently, establish the timeframes based on that or earlier Plan Approvals. Therefore, DEP has chosen to establish the timeframes for the expanded single aggregated project based on the dates that DEP received the complete application for Plan Approval No. 23-0119K, and ETMT proposes to commence construction and operation of the equipment of the Ethane Chilling Expansion Project (i.e., March 9, 2022, April 30, 2024,[9] and October 31, 2026,[9] respectively).

The first step of the PSD analysis is to determine whether the expanded single aggregated project causes a significant emissions increase of a regulated NSR pollutant. This is based on the sum of the emissions increases for each emissions unit,[7] and, as indicated in 40 CFR § 52.21(a)(2)(iv)(*d*) and (*c*), is determined differently based on whether the emissions unit is new or existing, respectively, as follows:

- Actual-to-potential test: For each new emissions unit, the emissions increase of a regulated NSR pollutant is the difference between the potential to emit[7] (PTE) and the baseline actual emissions[7] (BAE), the latter of which is generally zero.
- Actual-to-projected actual test: For each existing emissions unit, the emissions increase of a regulated NSR pollutant is the difference between the projected actual emissions[7] (PAE) and the BAE.

In addition, though not directly addressed in 40 CFR § 52.21, DEP also considers in the PSD analysis the "incremental emissions increase" of each regulated NSR pollutant for the sources and equipment of the expanded single aggregated project that have not undergone construction[7] (i.e., "any physical change or change in the method of operation"), but which have experienced an increase in utilization. This approach is consistent with United States Environmental Protection Agency (EPA) guidance (see *Attachment #3a–3c*, as highlighted).

---

[8] Since Delaware County is designated as nonattainment for ozone, and NO_x and VOCs are precursors to ozone, NO_x is also relevant to the NSR analysis.

[9] Based on a potential issuance date of April 30, 2024, for Plan Approval No. 23-0119K and DEP's understanding that ETMT intends to commence construction immediately upon issuance, DEP considers each of the milestones specified in the updated construction timeline for the Ethane Chilling Expansion Project (*Attachment #1*) to be pushed out by 6 months.

Except for one of the depropanizers (Source ID 090) previously authorized under (the original) Plan Approval No. 23-0119E, and the sources and equipment authorized under Plan Approval No. 23-0119J, all the sources and equipment that DEP previously reevaluated under Plan Approval No. 23-0119E (revised)) have already been installed and commenced operation more than 2 years ago. Therefore, DEP considers all installed sources and equipment of the expanded single aggregated project to be existing emissions units.

DEP has performed the first step of the PSD analysis for each of the authorizations comprising the expanded single aggregated project, as discussed below (in reverse chronological order):

A. Ethane Chilling Expansion Project (under Plan Approval No. 23-0119K)

While the ethane chiller train that ETMT has proposed to install as part of the Ethane Chilling Expansion Project will be newly constructed, it will also share tie-point connections with and utilize much of the same ethane chilling process equipment as the other existing ethane chiller trains at the MHT.[10] Similarly, while the BOG system that ETMT has proposed to install as part of the Ethane Chilling Expansion Project will be newly constructed and associated with one of the refrigerated ethane storage tanks (Source ID 124) authorized under Plan Approval No. 23-0119J), it may ultimately process ethane that went through any of the ethane chiller trains. Lastly, as part of the Ethane Chilling Expansion Project, ETMT has proposed to install new piping and fugitive emissions components for the ethane chiller train and BOG system, as well as for the existing feed metering, feed heating, amine treatment, and demethanizer off-gas systems. Accordingly, DEP considers the installation of the ethane chilling process equipment proposed as part of the Ethane Chilling Expansion Project to constitute construction[7] of an existing emissions unit.

However, historically, the various ethane chilling process equipment at the MHT have not been considered as discrete sources or emissions units from a permitting perspective, but as part of a larger grouping of fugitive emissions components at the MHT subject to various leak detection and repair (LDAR) requirements. As such, the fugitive emissions from the existing ethane chilling process equipment are not readily quantifiable, and ERM, on behalf of ETMT, did not apply the actual-to-projected actual test specified in 40 CFR § 52.21(a)(2)(iv)(*c*). Rather, using the calculation methodologies presented in EPA's Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017 (hereinafter referred to as "the EPA Protocol"), a component count based on the preliminary engineering design, and assuming continuous operation (i.e., 8,760 *hrs/yr*), ERM, on behalf of ETMT, has determined the GHG PTE, expressed as carbon dioxide equivalents [CO_2e], and VOC PTE for the new piping and fugitive emissions components, as follows:

- For the piping and fugitive emissions components that are not in VOC service[11] (i.e., those proposed to handle ethane, natural gas/fuel gas, and flare gas), ETMT multiplied the following values for each fluid type (see *Attachment #4a*):
  - The component counts for each component type.
  - The corresponding emission factors for each component type from Table 2-1 of the EPA Protocol.
  - The methane/GHG or VOC contents based on an engineering estimate of the speciated composition.
  - The global warming potential of methane from 40 CFR Part 98, Table A-1 (as applicable).

  [Note: Since these piping and fugitive emissions components are not in VOC service, ETMT did not apply any LDAR control effectiveness reductions.]

[10] During a July 17, 2023, telephone conversation with DEP, Mr. Smith of ETMT confirmed that the ethane chiller trains installed under Plan Approval Nos. 23-0119A and 23-0119D share tie-point connections, and that the new ethane chiller train will share tie-point connections with these ethane chiller trains as well.

[11] As the term is defined in 40 CFR § 60.481a (i.e., "contains or contacts a process fluid that is at least 10[%] VOC by weight"). By the same criteria, the piping and fugitive emissions components are in GHG service.

- For the piping and fugitive emissions components that are in VOC service (i.e., those proposed to handle propane, MR vapor,[12] and MR liquid), ERM, on behalf of ETMT, multiplied the following values for each fluid type (see *Attachment #4b*):
  - The component counts for each component type.
  - The corresponding leak rate emission factors for each component type from Tables 2-9,[13] 2-11, or 2-13 of the EPA Protocol.
  - The methane/GHG or VOC contents based on an engineering estimate of the speciated composition.
  - The global warming potential of methane from 40 CFR Part 98, Table A-1 (as applicable).

Since this approach is conservative as compared to the actual-to-projected actual test, DEP consents to this approach. However, as previously discussed in the *Emissions/Regulatory Analysis* section of DEP's technical review memo for the application for Plan Approval No. 23-0119J, dated February 5, 2021, DEP does not concur with the speciated composition information of 90% methane/GHGs and 0% VOCs indicated for the natural gas/fuel gas and flare gas fluid types in the PSD Plan Approval application. Therefore, on July 13, 2023, DEP requested that ETMT submit daily average gas chromatograph (GC) data for the natural gas used at the MHT over the prior 12 calendar months (i.e., July 2022–June 2023). The following day, ETMT submitted the requested GC data from Williams Pipeline Co., its natural gas supplier. From the GC data, DEP has calculated average methane/GHG and VOC contents for the natural gas (see *Attachment #5*).[14] Using these higher methane/GHG and VOC contents for the natural gas/fuel gas and flare gas fluid types, DEP has calculated GHG and VOC PTEs for the new piping and fugitive emissions components not in VOC service of 542.89 and 2.10 *tons/yr*, respectively (see *Attachment #6*).

DEP considers the routing of process vent flows from the ethane chiller train and BOG system to the East Cold Flare and Project Phoenix Cold Flare, respectively, to solely constitute an increase in utilization of the flares. Along these lines, ERM, on behalf of ETMT, has determined the incremental emissions increases of CO, GHGs, NO_x, SO_2, and VOCs associated with the process vent connections to the East Cold Flare and Project Phoenix Cold Flare (see *Attachment #7*), as follows:

- CO, NO_x, and SO_2: By multiplying the expected process vent flows to the flares, as listed in Tables 1 and 2, above (at the end of the *Ethane Chilling Expansion Project Description* section), by the higher heating values of the respective constituents (i.e., methane/natural gas, ethane, propane, butane, and pentane), and the CO, NO_x, and SO_2 emission factors for flares (0.31 *lbs/mmBtu*, 0.068 *lbs/mmBtu*, and 0.0006 *lbs/mmBtu*, respectively) from EPA's Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I (AP-42), Table 13.5-1.
- GHGs: Using the calculation methodology specified in 40 CFR § 98.233.
- VOCs: By multiplying the expected process vent flows of methane/natural gas, propane, butane, and pentane to the flares, as listed in Tables 1 and 2, above, by their higher heating values (and, for methane/

[12] The MR vapor piping and fugitive emissions components are also in GHG service.

[13] The leak rate emission factors from Table 2-9 of the EPA Protocol are correlated with the updated LDAR screening values provided by ERM, on behalf of ETMT, as part of the additional information requested by DEP for the PSD Plan Approval application. The LDAR screening values are based on actual leak concentration data from ETMT's LDAR program for the MHT for calendar years 2021–2022 (as opposed to the timeframe indicated in Footnote 1 of the "LDAR Screening Values" table).

[14] ETMT provided a comment on the draft version of this technical review memo clarifying that the GC data are in units of *%, by mole*, not *%, by weight*. Therefore, DEP has converted the values of the average methane/GHG and VOC contents to units of *%, by weight*, and has revised all affected GHG and VOC PTEs and emissions increases for this technical review memo accordingly.

natural gas, an assumed VOC content of 1%[15]), and a proposed VOC destruction and removal efficiencies (DREs) of either 98% (for flows with more than three carbons) or 99.0% (for flows with three or fewer carbons).

DEP considers the steam demand on the three auxiliary boilers by the existing dehydrators and WEG system, and for maintenance purposes, to solely constitute an increase in utilization of the auxiliary boilers. Along these lines, ERM, on behalf of ETMT, has determined the incremental emissions increases of CO, GHGs, H_2SO_4, NO_x, Pb, PM, PM_{10}, $PM_{2.5}$, SO_2, and VOCs associated with the steam demand on the three auxiliary boilers by the new ethane chiller train and BOG system using updated emission factors, based on 2018–2022 performance with a margin of 20%, as part of the additional information requested by DEP for the PSD Plan Approval application (see *Attachment #8*).

As discussed in Sub-sections A. and H. of the *Project Phoenix Description* section of DEP's technical review memo for Plan Approval No. 23-0119J, dated February 5, 2021, the refrigerated ethane storage tanks and the marine vessel loading (refrigerated), respectively, that the chilled ethane proceeds through are designed to have zero emissions (outside of fugitive emissions from piping and fugitive emissions components, as already considered above). This statement also applies to the refrigerated ethane storage tanks permitted under the TVOP and Plan Approval No. 23-0119E (revised). Therefore, there is no emissions increase for the refrigerated ethane storage tanks and marine vessel loading (refrigerated), and they are not considered further in the PSD analysis.

Based on the PTEs for the new ethane chiller train and BOG system, as well as the incremental emissions increases associated with the increases in utilization of the East Cold Flare, Project Phoenix Cold Flare, and auxiliary boilers, DEP has determined the emissions increases of CO, GHGs, H_2SO_4, NO_x, Pb, PM, PM_{10}, $PM_{2.5}$, SO_2, and VOCs for the Ethane Chilling Expansion Project. These emissions increases are listed in Table 3, below:

Table 3
Emissions Increases for the Ethane Chilling Expansion Project (*tons/yr*)

Equipment/Source	CO	GHGs	H_2SO_4	NO_x	Pb	$PM/PM_{10}/PM_{2.5}$	SO_2	VOCs
Piping and Fugitive Emissions Components	0	545.00	0	0	0	0	0	4.29
Cold Flares	1.603	721.76	0	0.3516	0	0	0.0013	0.488
Auxiliary Boilers	0.430	16,175	0.00678	3.774	0.00117	0.165	0.454	0.0715
Totals	2.033	17,442	0.00678	4.126	0.00117	0.165	0.455	4.849

B. De Minimis Emissions Increase (written notice received January 4, 2022)

While the product rerun lines of the depropanizer and debutanizer are existing equipment, DEP considers the installation of new YZ light liquid sampler systems and associated fugitive emissions components for the product rerun lines to be new emissions units.[16] Along these lines, ETMT has previously determined a VOC PTE of 0.0716 *tons/yr* for the new fugitive emissions components.

As with the flare connections proposed by ETMT as part of the Ethane Chilling Expansion Project, DEP considers the flare connections for the YZ light liquid sampler systems to the West Warm Flare to solely constitute an increase in utilization of the flare. Along these lines, ETMT has previously determined the

[15] This is approximately equal to the maximum daily VOC content of 0.991% indicated in the daily average GC data from Williams Pipeline Co (see *Attachment #5*).

[16] It bears mention that, pursuant to 25 Pa. Code § 127.203(b)(2)–(3), a de minimis emissions increase does not constitute a modification.

incremental emissions increases of CO, GHGs, NO_x, and VOCs for the flare connections. These incremental emissions increases are listed in Table 4, below:

Table 4
Incremental Emissions Increases Authorized by De Minimis Emissions Increase (*tons/yr*)

CO	GHGs	NO_x	VOCs
0.0059	2.5063	0.0013	0.0178

C. RFD No. 9332

While the H5 truck rack is an existing emissions unit, DEP considers the installation of a new butane truck loading station and associated fugitive emissions components at the H5 truck rack to be a new emissions unit. Along these lines, ETMT has previously determined a VOC PTE of 0.024 *tons/yr* for the new fugitive emissions components.

As with the flare connections proposed by ETMT as part of the Ethane Chilling Expansion Project, DEP considers the flare connection for the butane loading station at the H5 truck rack to the West Warm Flare to solely constitute an increase in utilization of the flare. Along these lines, ETMT has previously determined the incremental emissions increases of CO, GHGs, NO_x, and VOCs for the flare connection. These incremental emissions increases are listed in Table 5, below:

Table 5
Incremental Emissions Increases Authorized Under RFD No. 9332 (*tons/yr*)

CO	GHGs	NO_x	VOCs
0.015	6.28	0.0033	0.045

D. De Minimis Emissions Increase (written notice received May 19, 2021)

The replacement of two ethane recycle pumps constitutes construction[6] of existing emissions units. However, the only emissions increases associated with the replacement are for the routing of ethane vapors from the pump casings directly to the East Cold Flare (i.e., without any fugitive emissions components).

As with the flare connections proposed by ETMT as part of the Ethane Chilling Expansion Project, DEP considers the flare connection for the pump casings to the East Cold Flare to solely constitute an increase in utilization of the flare. Along these lines, ETMT has previously determined the incremental emissions increases of CO, NO_x, and VOCs for the flare connection. These incremental emissions increases are listed in Table 6, below:

Table 6
Incremental Emissions Increases Authorized by De Minimis Emissions Increase (*tons/yr*)

CO	NO_x	VOCs
0.00016	0.000035	0.00

E. RFD No. 9156

While the H5 truck rack is an existing emissions unit, DEP does not consider the installation of new fugitive emissions components associated with flare connections for the propane and butane loading and unloading stations at the H5 truck rack to constitute construction[6] because the change resulted in an emissions decrease of VOCs due to uncontrolled VOCs from disconnections being routed to the West Warm Flare instead of vented to the outdoor atmosphere. Therefore, the fugitive emissions components are not considered further in the PSD analysis.

As with the flare connections proposed by ETMT as part of the Ethane Chilling Expansion Project, DEP considers the flare connections for the propane and butane loading and unloading stations at the H5 truck rack

to the West Warm Flare to solely constitute an increase in utilization of the flare. Along these lines, ETMT has previously determined the incremental emissions increases of CO, GHGs, NO_x, and VOCs for the flare connections. These incremental emissions increases are listed in Table 7, below:

Table 7
Incremental Emissions Increases Authorized Under RFD No. 9156 (*tons/yr*)

CO	GHGs	NO_x	VOCs
0.0782	32.5175	0.0172	0.2266

F. Plan Approval No. 23-0119E (revised)

As stated above, DEP does not consider it appropriate to reassess or change the emissions increases it previously determined for the sources and equipment reevaluated under Plan Approval No. 23-0119E (revised). DEP has previously determined the emissions increases of CO, GHGs, H_2SO_4, NO_x, Pb, PM, PM_{10}, $PM_{2.5}$, SO_2, and VOCs for the sources and equipment reevaluated under Plan Approval No. 23-0119E (revised). These emissions increases are listed in Table 8, below:

Table 8
Emissions Increases for the Sources and Equipment Reevaluated
Under Plan Approval No. 23-0119E (revised) (*tons/yr*)

CO	GHGs	H_2SO_4	NO_x	Pb	PM	PM_{10}	$PM_{2.5}$	SO_2	VOCs
101.13	243,261	0.0574	58.89	0.00684	3.87	3.66	1.82	17.49	177.22

DEP has summed the emissions increases of CO, GHGs, H_2SO_4, NO_x, Pb, PM, PM_{10}, $PM_{2.5}$, SO_2, and VOCs for the respective authorizations of the expanded single aggregated project discussed above, and compared these to the associated significant emissions rates (see *Attachment #9*). These emissions increases and associated significant emissions rates are also listed in Table 9, below:

Table 9
Emissions Increases for the Expanded Single Aggregated Project & Significant Emissions Rates (*tons/yr*)
40 CFR § 52.21(a)(2)(iv)(*c*)–(*d*) and (b)(40)

	CO	GHGs	H_2SO_4	NO_x	Pb	PM	PM_{10}	$PM_{2.5}$	SO_2	VOCs
Emissions Increases	**103.26**	**260,744**	0.0642	**63.04**	0.00801	4.039	3.829	**1.983**	17.94	182.45
Significant Emissions Rates	100	75,000	7	40	0.6	25	15	10[17]	40	N/A

As indicated in Table 9, above, DEP has determined that the expanded single aggregated project results in significant emissions increases of CO, GHGs, NO_x, and $PM_{2.5}$ (the latter based on NO_x being a precursor to $PM_{2.5}$). Therefore, the next step is to perform a netting analysis to determine whether the expanded single aggregated project also results in significant net emissions increases of CO, GHGs, NO_x, and $PM_{2.5}$.

As indicated in 40 CFR § 52.21(b)(3)(i)–(ii), the net emissions increase is the sum of "[t]he increase in emissions from a particular physical change or change in the method of operation" (i.e., the significant emissions increases of CO, GHGs, and NO_x determined above) and "any other increases and decreases in actual emissions … that are contemporaneous with the particular change and are otherwise creditable," where the contemporaneous period "occurs between: (a) The date five years before construction on the particular change commences; and (b) The date that the increase from the particular change occurs." In line with the discussion in the fourth paragraph of this section and the updated construction timeline provided by ETMT (*Attachment #1*), DEP has chosen to set the date that construction on "the particular change" (i.e., the expanded single aggregated project) commences as

[17] The significant emissions rate for $PM_{2.5}$ is 10 *tons/yr* for direct $PM_{2.5}$, but 40 *tons/yr* for NO_x or SO_2 as precursors to $PM_{2.5}$.

October 31, 2023, the earliest potential issuance date of Plan Approval No. 23-0119K. Similarly, DEP has chosen to set the date that the increase from "the particular change" occurs as April 30, 2026, the date that operation of the equipment of the Ethane Chilling Expansion Project is indicated to commence. Therefore, DEP has used October 31, 2018–April 30, 2026, as the contemporaneous period to determine whether the expanded single aggregated project also results in significant net emissions increases of CO, GHGs, and NO_x.

In addition to the authorizations comprising the expanded single aggregated project, DEP has authorized other increases in actual emissions of CO, GHGs, NO_x, and VOCs during the contemporaneous period, via a de minimis emissions increase and three RFDs, for sources and equipment that are not related to the NGLs processing, storage, and distribution operations at the MHT. These other increases in actual emissions meet the criteria specified in 40 CFR § 52.21(b)(3)(iii)–(viii) for being creditable, and are listed in Table 10, below:

Table 10
Other Increases in Actual Emissions Authorized During the Contemporaneous Period (*tons/yr*)

Authorization (Date)	CO	GHGs	NO_x	VOCs
De Minimis Emissions Increase (written notice received March 22, 2019)	0.0010	0	0.00022	0.00301
RFD No. 7548 (approved April 11, 2019)	0.0679	30.39	0.0149	0.2090
RFD No. 9446 (approved July 14, 2022)	0.2336	27.79	0.0429	0.6000
RFD No. 9668 (approved May 23, 2022)	0.3388	40.07	0.0623	0.8650
Totals	0.6413	98.25	0.1203	1.6770

DEP has determined the net emissions increases of CO, GHGs, and NO_x for the expanded single aggregated project by summing the emissions increases and other increases in actual emissions of these regulated NSR pollutants listed in Tables 9 and 10, above, respectively, and compared these to the associated significant emissions rates (see *Attachment #9*). These net emissions increases and associated significant emissions rates are also listed in Table 11, below:

Table 11
Net Emissions Increases for the Expanded Single Aggregated Project & Significant Net Emissions Rates (*tons/yr*)
40 CFR § 52.21(a)(2)(iv)(*c*)–(*d*), (b)(3), and (b)(23)

	CO	GHGs	NO_x
Net Emissions Increases	**103.90**	**260,842**	**63.16**
Significant Net Emissions Rates	100	75,000	40

As indicated in Table 11, above, and by Footnote 15, above, DEP has determined that the expanded single aggregated project results in significant net emissions increases of CO, GHGs, NO_x, and $PM_{2.5}$ (the latter based on NO_x being a precursor to $PM_{2.5}$). Therefore, the expanded single aggregated project is a major modification subject to the PSD requirements of 40 CFR § 52.21, adopted in their entirety by DEP and incorporated by reference under 25 Pa. Code § 127.83, for these regulated NSR pollutants (see *PSD Requirements* section, below, for further discussion).

VI. PSD Requirements

As a major modification, the expanded single aggregated project is required to meet all applicable PSD requirements specified in 40 CFR § 52.21(j)–(p), as discussed below:

A. 40 CFR § 52.21(j)(1): The expanded single aggregated project is required to "meet each applicable emissions limitation under the State Implementation Plan and each applicable [NSPS, NESHAP, or MACT emissions standard]". All applicable emissions limitations and standards for the sources and equipment of the expanded

single aggregated project, including NSPS Subparts Db, Kb, VV, and VVa; and MACT Subparts Y and DDDDD, have been previously included in TVOP No. 23-00119 and Plan Approval Nos. 23-0119E (revised) and 23-0119J, and/or are addressed under Plan Approval No. 23-0119K.

B. 40 CFR § 52.21(j)(3): The expanded single aggregated project is required to meet "best available control technology [(BACT) requirements] for each [directly-emitted] regulated NSR pollutant [that] result[s] in a significant net emissions increase.[18] … This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation." Accordingly, the sources and equipment of the expanded single aggregated project that are required to meet BACT are all new and existing emissions units that underwent construction and contribute to the significant net emissions increases of CO, GHGs, and NO_x. DEP has addressed BACT requirements for these sources and equipment, as follows:

1. East Cold Flare, West Cold Flare, and Project Phoenix Cold Flare (Source IDs C01–C02 and C04, respectively): ETMT installed the East Cold Flare and West Cold Flare under Plan Approval Nos. 23-0119 and 23-0119D, respectively, both of which DEP previously reevaluated under Plan Approval No. 23-0119E (revised). ETMT is authorized to install and temporarily operate the Project Phoenix Cold Flare under Plan Approval No. 23-0119J. As indicated in *Attachment #3* of DEP's technical review memo for Plan Approval No. 23-0119E (revised), dated February 5, 2021, each of the cold flares is a source of CO, GHGs, and NO_x emissions. ETMT did not include in the PSD Plan Approval application a BACT analysis for the East Cold Flare and Project Phoenix Cold Flare which are proposed to have new process vent connections from the new ethane chiller train and BOG system of the expanded single aggregated project. However, as part of the additional information requested by DEP for the PSD Plan Approval application, ERM, on behalf of ETMT, submitted a best available technology (BAT) analysis for the cold flares for CO, NO_x, and VOCs to demonstrate that they still (will) meet the current BAT. Based on the BAT analysis, the cold flares continue to/will meet Lowest Achievable Emission Rate (LAER) and BAT for these pollutants, which, in conformance with 25 Pa. Code § 127.205(7), DEP considers to be at least as stringent as BACT.

   Since there are no established BAT emission limitations for GHGs for the cold flares, ETMT did not address GHGs in its BAT analysis. Nonetheless, DEP has reviewed EPA's RACT/BACT/LAER Clearinghouse (RBLC) and PSD permits for GHG precedents for flares, and the only potentially applicable GHG control techniques are the following:

   - Good flare design and combustion practices.
   - The use of pipeline-quality natural gas as a pilot fuel.
   - Minimizing the flows to the flares.
   - Fuel gas recovery systems.

   The first three GHG control techniques are feasible, and ETMT has implemented/will implement these for the cold flares, as follows:

   - The cold flares are/will be designed and operated in compliance with the requirements for flares specified in 40 CFR § 60.18.
   - The cold flares (will) use pipeline-quality natural gas exclusively as the pilot fuel.
   - ETMT has stated in the Plan Approval applications for the sources and equipment of the expanded single aggregated project that the projects have been designed to minimize overall emissions.

[18] The position that BACT limitations only apply to directly-emitted national ambient air quality standards (NAAQS) and/or precursor pollutants is consistent with EPA policy and was affirmed *In re Footprint Power Salem Harbor Development, LP*, PSD Appeal No. 14-02 (EAB 2014).

However, as discussed in Sub-section A.3. of the *NSR Requirements* section of DEP's technical review memo for Plan Approval No. 23-0119E (revised), dated February 5, 2021, a fuel gas recovery system is not feasible for the cold flares. Therefore, DEP considers the GHG emissions from the cold flares to meet BACT.

2. Piping and fugitive emissions components in GHG service: ETMT has included in the PSD Plan Approval application a full, top-down GHG BACT analysis for the fugitive emissions components of the Ethane Chilling Expansion Project in GHG service (see *Attachment #10*). In the GHG BACT analysis, ETMT has proposed to meet GHG BACT by performing auditory, visual, and/or olfactory (AVO) inspections for these fugitive emissions components on a weekly basis. DEP does not object to ETMT's determination of performing AVO inspections to meet GHG BACT. However, DEP's review of EPA's RBLC and PSD permits for GHG precedents for piping and fugitive emissions components has revealed multiple examples where AVO inspections for these are required to be performed on a daily basis.[19] Therefore, DEP has added requirements to the PSD Plan Approval (under Source ID 501) pertaining to the performance of AVO inspections for the piping and fugitive emissions components in GHG service on a daily basis. Moreover, since the PSD requirements are applicable to the expanded single aggregated project, not only the Ethane Chilling Expansion Project, DEP has applied the requirements specified under Source ID 501 to all the piping and fugitive emissions components in GHG service installed as part of the expanded single aggregated project.

C. 40 CFR § 52.21(k)–(n): ETMT has included with the PSD Plan Approval application, and submitted revised versions of, the Air Quality Modeling Report and air dispersion modeling for the expanded single aggregated project. As presented in the Air Quality Modeling Report, ETMT performed air quality analyses of the net emissions increases of CO, NO_2/NO_x, and $PM_{2.5}$ for the expanded single aggregated project. DEP's Air Quality Modeling Section has reviewed the air quality analyses and air dispersion modeling (see *Attachment #11*).

D. 40 CFR § 52.21(o)(1): ETMT has included with the PSD Plan Approval application, and submitted revised versions of, the Air Quality Modeling Report and air dispersion modeling for the expanded single aggregated project. As presented in the Air Quality Modeling Report, ETMT performed additional impact analyses of the impairment to visibility, soils, and vegetation for the expanded single aggregated project. DEP's Air Quality Modeling Section has reviewed these additional impact analyses (see *Attachment #11*).

E. 40 CFR § 52.21(o)(2): Moreover, ETMT has provided an analysis of air quality impacts projected for the area from general commercial, residential, industrial and other growth associated with the expanded single aggregated project. DEP concurs with ETMT that such additional air quality impacts are expected to be negligible.

F. 40 CFR § 52.21(p): ETMT has provided written notice of the PSD Plan Approval application to the Federal Land Managers of nearby federal Class I areas, along with initial screening calculations. DEP's Air Quality Modeling Section has reviewed these additional impact analyses (see *Attachment #11*).

VII. NSR Analysis

Pursuant to 25 Pa. Code § 127.201(f), the MHT is "considered a major facility[20] and … subject to the requirements applicable to a major facility located in a severe nonattainment area[20] for ozone." Therefore, in accordance with 25 Pa. Code §§ 127.203a and 127.203(b)(1)(i)–(ii), DEP is required to perform an NSR analysis

[19] Examples of PSD permits requiring AVO inspections of fugitive emissions components in GHG service on a daily basis include:

- Virginia Electric and Power Co.—Greensville County Power Station: PSD Permit No. 52525, issued July 2, 2021.
- NTE Carolinas II, LLC—Reidsville Energy Center: PSD Permit No. 10494R00, issued July 14, 2017.
- Enterprise Products Operating LLC—Mont Belvieu: PSD Permit No. PSD-TX-1336-GHG, issued April 16, 2014.

[20] As the term is defined in 25 Pa. Code § 121.1.

to determine whether the aggregated emissions increases of NO_x or VOCs (i.e., the sum of the emissions increases for the expanded single aggregated project and either of the following) exceed 25 *tons/yr*:

- "[T]he other increases in net emissions occurring over a consecutive 5 calendar-year period, which includes the calendar year of the modification or addition which results in the emissions increase.
- [The] other increases and decreases in net emissions occurring within 10 years prior to the date of submission of a complete Plan Approval application."

As with the PSD analysis, before beginning the NSR analysis, it is critical to define the project and establish the associated timeframes. As with the PSD analysis, DEP has defined the project as the expanded single aggregated project and has chosen to establish the timeframes for the expanded single aggregated project based on the actual dates that DEP received the complete application for Plan Approval No. 23-0119K, and ETMT proposes to commence construction and operation of the equipment of the Ethane Chilling Expansion Project.

First, DEP has determined the emissions increases of NO_x and VOCs for the expanded single aggregated project. As with the PSD analysis, these are based on the sum of the emissions increases for each emissions unit,[20] and, as indicated in 25 Pa. Code § 127.203a(a)(1)(i)(B) and (A), is determined differently based on whether the emissions unit is new or existing, respectively, as follows:

- "For new emissions units, the emissions increase of a regulated NSR pollutant[6,20] will be the potential to emit[20] [(PTE)] from each new emissions unit."
- "For existing emissions units, an emissions increase of a regulated NSR pollutant is the difference between the projected actual emissions[20] [(PAE)] and the baseline actual emissions[20] [(BAE)] for each unit."

In addition, though not directly addressed in 25 Pa. Code §§ 127.203 and 127.203a, DEP also considers in the NSR analysis the "incremental emissions increase" of NO_x and VOCs from the sources and equipment of the expanded single aggregated project that have not undergone a modification,[20] but which have experienced an increase in utilization.

As with the PSD analysis, DEP considers all installed sources and equipment of the expanded single aggregated project to be existing emissions units.

Accordingly, the emissions increases of NO_x and VOCs from the respective sources and equipment of the expanded single aggregated project, as presented in the *PSD Analysis* section, above, are the same for the NSR analysis. The emissions increases of NO_x and VOCs for the expanded single aggregated project are indicated in Table 9, of the *PSD Analysis* section, above.

Next, DEP has determined the other increases in net emissions of NO_x and VOCs occurring over a consecutive 5 calendar-year period. Similar to the PSD analysis, DEP has chosen to set the date of "the modification or addition which results in the emissions increase" as April 30, 2026, the date that operation of the equipment of the Ethane Chilling Expansion Project is proposed to commence. Therefore, DEP has used the 2022–2026 timeframe as the consecutive 5 calendar-year period for which to determine the other increases in net emissions of NO_x and VOCs. The other increases in net emissions of NO_x and VOCs are those associated with RFD Nos. 9446 and 9668, as indicated in Table 10, of the *PSD Analysis* section, above.

DEP has determined the aggregated emissions increases of NO_x and VOCs for the expanded single aggregated project by summing the emissions increases and other increases in net emissions of these pollutants listed in

Tables 9 and 10, of the *PSD Analysis* section, above, respectively (see *Attachment #9*). These aggregated emissions increases are also listed in Table 12, below:

Table 12
Aggregated Emissions Increases for the Expanded Single Aggregated Project (*tons/yr*)
25 Pa. Code § 127.203(b)(1)(i)

	NO_x	VOCs
Aggregated Emissions Increases	**63.15**	**183.92**
Significant Emissions Rates	25	25

Since the aggregated emissions increases of both NO_x and VOCs for the expanded single aggregated project exceed 25 *tons/yr*, the aggregated emissions increases are significant[7,20] for both pollutants. Therefore, the expanded single aggregated project is subject to the NSR requirements of 25 Pa. Code Chapter 127, Subchapter E, for both NO_x and VOCs, and there is no need to determine the aggregated emissions increase in accordance with 25 Pa. Code § 127.203(b)(1)(ii). ETMT is required to implement LAER for NO_x and VOCs in accordance with 25 Pa. Code §§ 127.203(b)(2) and 127.205(1), and offset the aggregated emissions increases of NO_x and VOCs in accordance with 25 Pa. Code §§ 127.201(d) and 127.210(a) (see *NSR Requirements* section, below, for further discussion).

VIII. NSR Requirements

The expanded single aggregated project is required to meet the following NSR requirements, as indicated in 25 Pa. Code § 127.205(1)–(5), respectively:

- Implement a level of pollution control that meets LAER.
- Certify that each facility located within the Commonwealth that is owned, operated, or controlled by ETMT and subject to NSR requirements and emission restrictions, is in compliance, or are on a schedule of compliance, with all applicable emission restrictions and standards.
- Obtain and surrender the required emission offsets, at the required offset ratio, prior to commencement of operation of the affected source(s), from other sources that impact a nonattainment area in the same or lower nonattainment classification area than the one in which they were generated.
- Demonstrate through an analysis of alternative sites, sizes, production processes, and environmental control techniques that the benefits of the proposed project significantly outweigh the environmental and social costs imposed on the Commonwealth as a result of its location, construction, or modification.

A. 25 Pa. Code § 127.205(1)

ETMT has included in the PSD Plan Approval application a LAER evaluation of the Ethane Chilling Expansion Project in accordance with EPA's guidance in the October 1990 draft NSR Workshop Manual and applicable federal and Commonwealth regulations. As indicated in 25 Pa. Code § 127.205(1), "only sources which are new or which are modified shall be required to implement LAER." Except as discussed below, DEP has previously and fully addressed LAER for the new and modified sources and equipment of the expanded single aggregated project reevaluated under Plan Approval No. 23-0119E (revised). The following sources and equipment of the expanded single aggregated project are required to meet LAER:

1. Piping and fugitive emissions components in VOC service: The piping and fugitive emissions components of the expanded single aggregated project in VOC service that DEP reevaluated under Plan Approval No. 23-0119E (revised), and authorized under Plan Approval No. 23-0119J, are currently subjected to the NSPS for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 [40 CFR Part 60, Subpart VVa], including leak levels and the use of an approved LDAR program. In its

LAER evaluation, ETMT has proposed that these requirements be extended to the new piping and fugitive emissions components of the Ethane Chilling Expansion Project in VOC service, and that they likewise constitute LAER. While DEP previously considered ETMT's LDAR program for the piping and fugitive emissions components of the expanded single aggregated project, as permitted in the TVOP and Plan Approval Nos. 23-0119E (revised) and 23-0119J (under Source ID 103), to meet LAER,[21] this is no longer the case for the following reasons:

- ETMT's recent compliance history regarding its LDAR program:
  - On December 14, 2020, and February 4, 2021, DEP issued Notices of Violation (NOVs) to ETMT for multiple LDAR-related violations, including failure to monitor numerous fugitive emissions components per regulatory requirements. On November 12, 2021, DEP and ETMT entered into a Consent Assessment of Civil Penalty (CACP) to address these violations.
  - On October 5, 2021, and February 22, 2022, DEP issued NOVs to ETMT for multiple LDAR-related violations, including further instances of failing to monitor fugitive emissions components per regulatory requirements. On September 13, 2022, DEP and ETMT entered into a CACP to address these violations.
  - On February 16, 2023, DEP issued an NOV to ETMT for further instances of failing to monitor fugitive emissions components per regulatory requirements. On September 12, 2023, DEP and ETMT entered into a CACP to address these violations.
- DEP mistakenly considered ETMT's LDAR program to be a fully directed maintenance program, in which ETMT uses a gas analyzer in conjunction with the repair or maintenance of leaking fugitive emissions components. However, during a May 17, 2023, telephone conversation with DEP, Mr. Smith of ETMT confirmed that this is currently only the case for simple repairs (e.g., tightening a nut or fitting, etc.) that can be performed by the third-party contractor that performs all the monitoring with the gas analyzer. For more extensive repairs (and replacements), Mr. Smith stated that ETMT has a separate maintenance crew that handles these but does not perform any simultaneous monitoring with the gas analyzer.

Rather, DEP considers compliance with the LDAR requirements indicated in the Texas Commission on Environmental Quality's (TCEQ's) 28LAER program as LAER. Therefore, DEP has specified all applicable 28LAER requirements in the PSD Plan Approval under Source ID 400 and all other existing VOC LDAR requirements, including those that are more stringent than 28LAER, under Source ID 401. Similar to the requirements added under Source ID 501 for the piping and fugitive emissions components in GHG service, DEP has applied the requirements added under Source IDs 400–401 to all the piping and fugitive emissions components installed as part of the expanded single aggregated project.

2. Non-refrigerated marine vessel loading (Source ID 115): DEP previously reevaluated the existing non-refrigerated marine vessel loading under Plan Approval No. 23-0119E (revised). As discussed in the *NSR Analysis* section of the associated technical review memo, dated February 5, 2021, DEP calculated an emissions increase of VOCs for the non-refrigerated marine vessel loading based on an increase in actual average throughput as compared to the average historical throughput. This increase in utilization of the non-refrigerated marine vessel loading represents a modification (i.e., the PAE for the non-refrigerated marine vessel loading is greater than the BAE). However, in the technical review memo, DEP inadvertently included the non-refrigerated marine vessel loading with other sources and equipment that did not undergo a modification. Therefore, DEP did not address whether the non-refrigerated marine vessel loading meets LAER.

   To this end, as part of the additional information requested by DEP for the PSD Plan Approval application, ERM, on behalf of ETMT, submitted a source description for the existing non-refrigerated marine vessel loading that details how VOC emissions are controlled and fugitive emissions are

[21] See Sub-section A.2. of the *NSR Requirements* section of DEP's technical review memo for Plan Approval No. 23-0119E (revised), dated February 5, 2021, for further discussion.

minimized.[22] Liquid loading arms and a vapor return line on the marine vapor recovery (MVR) skid at Dock 3B are connected to marine vessels for the loading of petroleum products with a Reid Vapor Pressure greater than 4.0 *psia* and/or a hazardous air pollutant (HAP) content of greater than 0.5% at Dock 3A, with the hydrocarbon vapors displaced from the vapor space within the cargo tanks on the marine vessels ultimately being routed to the existing auxiliary boilers, as follows:

- Hydrocarbon vapors from the vapor space within the cargo tanks on the marine vessels that are displaced during the loading of petroleum products are pulled through the vapor return line on the MVR skid and compressed and condensed by the MVR unit.
- Following the loading:
  - The liquid loading arms are pumped free of petroleum products by a vacuum truck, then the liquid loading arms and vapor return lines are disconnected and immediately blanked.
  - The MVR unit is swept with natural gas, and the combination of recovered hydrocarbons and natural gas (i.e. fuel gas) is routed to process gas vessel V282 in the existing 15-2B gas plant.
- Natural gas is injected into process gas vessel V282 to push the fuel gas to the auxiliary boilers to be consumed.

The non-refrigerated marine vessel loading is subject to the provisions of MACT Subpart Y, including the following:

- Confirmation of vapor tightness for each marine vessel loaded, via either documentation or leak testing during loading using EPA Method 21.
- The reduction of VOCs and HAPs from marine vessel loading, via the combustion of recovered hydrocarbons by the auxiliary boilers, of 98*%, by weight*, and 97*%, by weight*, respectively.
- Annual and ongoing LDAR for the vapor collection system (i.e., piping, fugitive emissions components, and flow inducing devices) and control devices (i.e., the MVR unit and auxiliary boilers) using EPA Method 21.

As indicated in the source description submitted by ERM, on behalf of ETMT, the auxiliary boilers have a VOC and HAP destruction efficiency of 99%.

ETMT currently follows the LDAR requirements of MACT Subpart Y for the MVR unit and all portions of the vapor collection system up to process gas vessel V282. However, based on the facts that process gas vessel V282 receives fuel gas flows from sources and equipment that are part of the expanded single aggregated project, and the VOC content of the fuel gas has the potential to exceed 10%, ETMT currently follows the LDAR requirements of NSPS Subpart VVa for the piping and fugitive emissions components leading from process gas vessel V282 to the existing auxiliary boilers.[23]

Based on the facts that the non-refrigerated marine vessel loading is used only occasionally and does not have a history of leaks, DEP consents to ETMT following the LDAR requirements of MACT Subpart Y for the portion of the vapor collection system between the MVR unit and process gas vessel V282. Therefore, except for applying the additional requirements under Source ID 401 for the piping and fugitive emissions components leading from process gas vessel V282 to the existing auxiliary boilers, as discussed in Sub-section A.1. of the *NSR Requirements* section, above, DEP considers ETMT's LDAR program for the non-refrigerated marine vessel loading to constitute LAER.

[22] During May 17, 2023, and July 28, 2023, telephone conversations with DEP, Mr. Smith of ETMT provided additional information for the marine vessel loading.

[23] The remaining piping and fugitive emissions components of the existing 15-2B gas plant, which is not part of the expanded single aggregated project, are subjected to the NSPS for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006 [40 CFR Part 60, Subpart VV], as permitted in the TVOP (under Source ID 801).

B. 25 Pa. Code § 127.205(2)

To ETMT's knowledge, all existing sources located within the Commonwealth that are owned, operated, or controlled by ETMT are in compliance with applicable local, state, and federal regulations and consent decree requirements, or are on a compliance schedule.

C. 25 Pa. Code § 127.205(3)–(4)

Pursuant to 25 Pa. Code § 127.201(f), the MHT is subject to the requirements applicable to a major facility located in a severe nonattainment area for ozone. Therefore, as indicated in 25 Pa. Code § 127.210(a), ETMT is required to offset the aggregated emissions increases of NO_x and VOCs at the offset ratio of 1.3:1. Based on the significant aggregated emissions increases of NO_x and VOCs indicated in Table 12, of the *NSR Analysis* section, above, and the required offset ratio, ETMT is required to surrender 82.09 *tons/yr* of NO_x Emission Reduction Credits (ERCs) and 239.10 *tons/yr* of VOC ERCs. As specified in Table 13, below, ETMT has previously surrendered and DEP has previously retired the following NO_x ERCs and VOC ERCs for the expanded single aggregated project:

Table 13
NO_x ERCs and VOC ERCs Previously Surrendered/Retired for the Expanded Single Aggregated Project
25 Pa. Code §§ 127.206–127.210

Associated Plan Approval No.	ERC Surrender Date	Amount of ERCs Surrendered/ Retired (*tons/yr*)		ERC Generating Facility	Emission Reduction Date	Emission Reduction Technique
		NO_x	VOC			
23-0119B	4/7/2016	0	34.65	SPMT	12/30/2011	Shutdown of sources at the Marcus Hook Industrial Complex (MHIC)[24] (Delaware County, PA)
23-0119E	3/6/2017	32.80	26.46	SPMT	12/30/2011	Shutdown of sources at the MHIC
		0	25.16	Sunoco, Inc. (R&M)	4/1/2007	Shutdown of sources at a Sunoco Chemicals facility (Allegheny County, PA)
		0	4.48	Sunoco, Inc. (R&M)	9/30/1994	Overcontrol of emissions at the former Marcus Hook Refinery (Delaware County, PA)
23-0119F	5/31/2016	0	17.77	SPMT	12/30/2011	Shutdown of sources at the MHIC
23-0119H	6/26/2018	0	19.02[25]	Crown Cork & Seal USA, Inc.	12/31/2015	Shutdown of Crown Cork & Seal USA, Inc., facility (Baltimore County, MD)
23-0119E (revised)	2/5/2021	46.35[26]		Exelon Generation Company, LLC	2/17/2011	Shutdown of boiler #1 at Eddystone Generation Station (Delaware County, PA)
			59.07	Sunoco, Inc. (R&M)	9/30/2004	Overcontrol of emissions at the former Marcus Hook Refinery
Totals		**79.15**	**186.61**			

[24] The MHIC is the former name of the MHT.

[25] SPMT surrendered 106.83 *tons/yr* of VOC ERCs under Plan Approval No. 23-0119H (see transactions 226 and 242). However, only 19.02 *tons/yr* of VOC ERCs are attributable to the expanded single aggregated project.

[26] SPMT surrendered 64 *tons/yr* of NO_x ERCs under Plan Approval No. 23-0119E (revised), though the Plan Approval only required SPMT to surrender 46.35 *tons/yr* of VOC ERCs.

DEP previously reviewed and approved these ERCs to confirm that they satisfied all applicable provisions of 25 Pa. Code §§ 127.206–127.208, and registered them in Pennsylvania's ERC Registry System, as indicated on DEP's website at the following links (with corresponding highlighting):

- http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Permits/erc/ERC_PA_Report.pdf.
- https://www.pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol48/48-4/144d.html.
- https://www.pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol39/39-3/77d.html.

For the VOC ERCs highlighted in orange, the ERC Registry System report specifies that SPMT held the required ERCs and used them as offsets for the associated Plan Approvals (see transactions 171, 236, 172, 226, and 263, respectively). As such, these ERC transactions are fully substantiated.

For the NO_x ERCs highlighted in orange, the ERC Registry System report indicates that SPMT held the required ERCs (see transaction 247), but does not indicate that SPMT used the ERCs as offsets for Plan Approval No. 23-0119E (revised). On February 5, 2021, SPMT submitted a letter to DEP requesting that DEP include the NO_x ERCs in the final issuance of Plan Approval No. 23-0119E (revised) (see *Attachment #12*). On February 12, 2021, DEP issued Plan Approval No. 23-0119E (revised), in which it memorialized the use of the NO_x ERCs (specifically, in Condition # 004, Section C) prior to their expiration date. As such, DEP considers this ERC transaction to be fully substantiated.

For the NO_x and VOC ERCs highlighted in aqua and the VOC ERCs highlighted in green, the *Pa. Bulletin* notices only indicated that SPMT held the required NO_x and VOC ERCs. On March 6, 2017, SPMT submitted a letter to DEP requesting the surrender of the required NO_x and VOC ERCs prior to their expiration date (see *Attachment #13*). On March 28, 2017, DEP modified (the original) Plan Approval No. 23-0119E, in which it memorialized the use of the NO_x and VOC ERCs (specifically, in Condition # 003, Section C) prior to their expiration date. As such, DEP considers these ERC transactions to be fully substantiated.

Therefore, to fully offset the aggregated emissions increases of NO_x and VOCs for the expanded single aggregated project, ETMT is required to surrender 2.94 *tons/yr* of NO_x ERCs and 52.49 *tons/yr* of VOC ERCs.[27]

[27] In Attachment #6 of its technical review memo for Plan Approval No. 23-0119E (revised), dated February 5, 2021, and Attachment #9 of the draft version of this technical review memo, DEP had previously indicated the use of 7.18 *tons/yr* of VOC ERCs associated with Plan Approval No. 23-0119C as "ERCs Previously Surrendered and Retired." This was based on the discussion in DEP's review memo for Plan Approval No. 23-0119D, dated February 23, 2015 (see *Attachment #14*, pp. 8 [last paragraph]–9 [first full paragraph]) and footnotes in the contemporaneous emissions tables attached to the applications for Plan Approval Nos. 23-0119D through 23-0119H (see *Attachment #15* [Footnote 2 in Table F-2 from Plan Approval No. 23-0119H, as an example], though the amount of VOC offsets was indicated as 7.17 *tons/yr*). However, after a thorough review of the ERCs applied for the expanded single aggregated project, DEP did not uncover and ETMT did not furnish information substantiating that SPMT applied for, let alone surrendered/retired these VOC ERCs. Therefore, DEP has listed these VOC ERCs in Attachment #9 for the proposed technical review memo as "ERCs Still Required to Be Surrendered" (though under Plan Approval No. 23-0119E (revised) because they were should have been required under that authorization). Accordingly, DEP requested that ETMT surrender these VOC ERCs prior to the issuance of Plan Approval No. 23-0119K, so that it may memorialize the retirement of these VOC ERCs as a condition in the Plan Approval. On March 8, 2024, ETMT submitted a letter to DEP requesting the surrender of the required VOC ERCs from the shutdown of sources at ETMT's Darby Creek Tank Farm facility (see *Attachment #15*). DEP has indicated the retirement of these VOC ERCs in Condition # 004, Section C, of the PSD Plan Approval.

Under Plan Approval No. 23-0119J, ETMT is required to surrender 49.93 *tons/yr* of VOC ERCs prior to the commencement of operation of the sources and equipment authorized under that Plan Approval. However, when summed with the 7.18 *tons/yr* of VOC ERCs discussed above, the total amount of ERCs that ETMT is required to surrender is greater than that necessary to fully offset the aggregated emissions increases of VOCs for the expanded single aggregated project. This is due to the different timeframes that DEP used to determine the other increases in net emissions of VOCs, pursuant to 25 Pa. Code § 127.203(b)(1)(i), between Plan Approval No. 23-0119E (revised) and Plan Approval No. 23-0119K, resulting in an overall reduction in the other increases in net emissions of VOCs that is greater than the total

ETMT has stated in the PSD Plan Approval application that it intends to secure the required NO_x ERCs. Moreover, DEP has confirmed with ETMT that it intends to secure the required VOC ERCs.

D. 25 Pa. Code § 127.205(5)

ETMT has conducted an analysis of alternative sites, sizes, production processes, and environmental control techniques to demonstrate that the benefits of the MHT significantly outweigh the environmental and social costs imposed on the Commonwealth as a result of its location, construction, or modification. Except for the equipment proposed to be installed as part of the Ethane Chilling Expansion Project, the sources and equipment authorized under Plan Approval No. 23-0119J, and one of the depropanizers (Source ID 090) authorized under the original Plan Approval No. 23-0119E, all the sources and equipment of the expanded single aggregated project have already commenced operation and rely upon existing equipment and utilities at the MHT, including pipeline infrastructure that terminates at the MHT and marine vessel loading docks. Furthermore, ETMT has stated that "equipment sizing and production processes were determined in order to meet technical requirements and business demands of the [MHT]," and contends that "[r]elocating, replacing, or rerouting this pipeline infrastructure outside of existing right-of-ways would create an unnecessary net environmental and community disturbance." Lastly, ETMT contends that, because of the MHT's location in an area subject to the requirements applicable to a severe nonattainment area for ozone, the sources and equipment of the expanded single aggregated project have been/will be designed to minimize overall emissions and meet associated NSR, LAER, and ERC requirements, which may not be the same for a suitable alternate industrial location. Based on the above, DEP concurs that the benefits of the MHT significantly outweigh the environmental and social costs imposed on the Commonwealth as a result of its location, construction, or modification.

IX. Recommendation

Based on a review of the following, I recommend that DEP issue Plan Approval No. 23-0119K to ETMT for the Ethane Chilling Expansion Project and all piping and fugitive emissions components installed as part of the expanded single aggregated project, as discussed herein:

- The PSD Plan Approval application, including the addendum and additional requested information.
- Plan Approval Nos. 23-0119E (revised), 23-0119J, and the other previously-issued Plan Approvals for the sources and equipment of the expanded single aggregated project, as well as the associated applications and technical review memos.
- RFD Nos. 5597, 7548, 9156, 9332, 9446, and 9668, as well as the associated applications.
- The de minimis emissions increases written notices received on March 22, 2019, May 19, 2021, and January 4, 2022.
- TVOP No. 23-00119.
- EPA's RBLC.

---

emissions increases of VOCs for the proposed Ethane Chilling Expansion Project. As such, ETMT provided a comment on the draft version of Plan Approval No. 23-0119K requesting that, if the sources installed under the PSD Plan Approval commence operation on an earlier date than those installed under Plan Approval No. 23-0119J, ETMT be required to surrender only the amount of VOC ERCs necessary to fully offset the aggregated emissions increases of VOCs for the expanded single aggregated project (i.e., 45.31 *tons/yr*). DEP concurs and has revised Condition # 003, Section C, of the PSD Plan Approval, accordingly, except that it has also added a footnote to the condition that, "[e]ffective March 15, 2024, an offset sanction was triggered in accordance with section 179 of the Clean Air Act (42 U.S.C. § 7509) and 40 CFR § 52.31 following EPA's finding of inadequacy and partial disapproval of the Commonwealth's State Implementation Plan (SIP) to address Reasonably Available Control Technology (RACT) for the 1997 and 2008 ozone NAAQS. If the sanctions clock is still in effect when the permittee is seeking to surrender NO_x ERCs and VOC ERCs to satisfy this condition, the permittee would be required to do so at the offset ratio of 2:1 instead of 1.3:1."

Smith, David S

From: Smith, Kevin W <kevin.smith2@energytransfer.com>
Sent: Wednesday, June 21, 2023 12:52 PM
To: Smith, David S
Cc: Garcia, Lisa M
Subject: [External] Construction Timeline
Attachments: Construction Timeline.docx

Dave,

The 36 month construction timeline you requested is attached. If you need anything else, please let me know.

Thanks,
Kevin

ENERGY TRANSFER
Moving America's Energy

Kevin W. Smith
Sr. Specialist – Env. Compliance
Energy Transfer

O: 610.859.1279
C: 215.817.3361

Attachment #1

Construction Timeline

- October 2023 – Detailed engineering design.
- November 2023 – Begin bidding process and place purchase orders for critical equipment (tower internals, exchangers, pumps).
- July 2024 – Complete detailed civil, structural, and mechanical engineering design. Begin bidding process.
- August 2024 – Complete piping design. Begin bidding process.
- September 2024 – Begin civil and structural construction.
- December 2024 – Complete electrical and instrumentation design. Begin bidding process.
- January 2025 – Begin mechanical and piping construction.
- March 2025 – Start electrical and instrumentation construction.
- March 2026 – Testing and pre-commissioning
- April 2026 – Start-up and shakedown of sources

Table 3-1: Potential Fugitive VOC and CO_2e Emissions

New Fugitive Components	Number of Components	VOC Emissions[1] (TPY)	CO_2e Emissions (TPY)
Valves	1,814	1.00	274.65
Pump Seals	3	0.04	0.01
Compressor Seals	15	0.35	13.21
Pressure Relief Valves	34	0.40	15.06
Flanges/Connectors	5,187	3.36	219.73
Other	1	0.05	0.07
Total Fugitive Emissions		**5.20**	**522.74**

[1] Potential fugitive emissions are estimated based on USEPA guidance correlations ("Protocol for Equipment Leak Emission Estimates", EPA-453/R-95-017).

3.2 Incremental Steam Demand Emissions

The expected annual average steam demand for the MHIC as a result from expanding the ethane chilling process is approximately 23,673 pounds per hour of steam (lb/hr) as shown in **Appendix D**. The Auxiliary Boilers will not be modified in any way to produce the incremental steam required for this Project. As shown in **Table 3-2** below, the expected annual average steam demand (approximately 23,673 lb/hr) is below the combined steam production capacity of the Auxiliary Boilers and this steam demand can be accommodated within the existing Title V Operating Permit emissions limits[4]. Therefore, the incremental steam demand emissions for this Ethane Chilling Expansion Project from the Auxiliary Boilers have already been previously permitted; however, these emissions increases are conservatively included as project emissions increases.

[4] The emission limits were originally established for four Auxiliary Boilers with Plan Approval 23-0119B. The emissions limits for the remaining three Auxiliary Boilers were revised with the removal of Auxiliary Boiler 2 (Source ID 032) as part of the major operating permit modification to TVOP 23-00119 in December 2016. The annual emission limit for CO was reduced as a part of a minor modification to the Title V Operating Permit 23-00119 in August 2019.

September 17, 1993

Mr. Larry Devillier
Supervisor, Permit Section
Office of Air Quality and Radiation
Protection
Louisiana Department of
Environmental Quality
P.O. Box 82135
Baton Rouge, Louisiana 70884-2135

Re: Union Carbide Chemicals and Plastics Company, Inc.
PSD Applicability

Dear Mr. Devillier:

We have reviewed the application dated May 18, 1993, from Union Carbide Chemicals and Plastics Company, Inc. concerning a permit to construct and operate a new polyethylene (PE) production facility at its Taft/Star Complex located near Taft, St. Charles Parish Louisiana.

The new PE production facility will require steam from an existing power system consisting of four boilers. The boilers will increase emissions as a result of the PE project. This increase must be included in the net emission increase for the PE project. You have suggested the following methodology for computing the net emissions increase. The potential emissions from the new PE facility at maximum production capacity plus the increased emissions from the existing boilers attributable to the new facility operating at maximum capacity will be the increase attributable to the proposed change. For this specific situation, where the existing boilers are not being modified and the demand from the new PE unit on the existing boilers can be specifically quantified, the emissions increase from the existing boilers that occurs as a direct result of the proposed PE project should be based on the maximum utilization for which the new PE unit would be permitted. At present, we agree that this methodology is applicable to this proposed project.

I trust this answers the question that you posed in your August 10, 1993 letter regarding net emission increase. If you have any questions, please call Mr. Reverdie Daron Page of my staff at (214) 655-7222.

Sincerely yours,

ORIGINAL SIGNED BY
JOLE C. LUEHRS
Jole C. Luehrs
Chief
New Source Review Section (6T-AN)

cc: David Solomon

6T-AN:PAGE:X7222:dp: 09/13/93 DOC.F:UNIONCRB4.LET

7-25-01

Ms. Bliss Higgins
Assistant Secretary
Environmental Services Division
Louisiana Department of Environmental Quality
P. O. Box 82135
Baton Rouge, LA 70884-2135

RE: Motiva Enterprises, LLC
Low Sulfur Gasoline (LSG) Project – Related Emission Increase Methodology

Dear Ms. Higgins:

On April 10, 2001, we received a copy of a proposal sent to you by Motiva's two Louisiana refineries (see enclosure). Motiva's concern relates to the acceptable method to calculate emission increases resulting from their proposed LSG project. The company proposes to install new desulfurization equipment at their refineries designed to comply with the Environmental Protection Agency's (EPA) Tier 2 LSG regulation. The new equipment will result in increased utilization of existing equipment at the refineries. The existing equipment at which increased utilization is expected to occur as a result of the new desulfurization equipment will likely include steam boilers, hydrogen plants, sulfur recovery units, and flare systems. Motiva proposes to calculate emission increases from the existing equipment which will support the new desulfurization equipment based on what they term the "proposed potential increase in utilization" caused by the need to support the new equipment.

As you are aware, EPA's regulations define a "major modification" as one in which a physical change or change in the method of operation of a major stationary source results in a significant net emissions increase (see 40 Code of Federal Regulations section 52.21(b)(2)). In determining whether a proposed change will be a major modification, it is necessary to first calculate the total increase in emissions that will result from the proposed changes at the source. This calculation includes (1) increases occurring at all new or modified units, and (2) any other increases at existing emissions units not being modified which could experience emission increases that will

result from the change. (It is important to note that emission decreases that may be associated with a proposed project are not considered in this initial step. They may, however, be considered if the source wishes to net the project out of major new source review by considering all increases and decreases in emissions that are contemporaneous with the project and otherwise creditable.) The existing equipment described above by Motiva are examples of units which will not be modified as part of the change, but could nonetheless experience emission increases as a result of the operation of the new desulfurization equipment.

For the new and modified units associated with the new desulfurization unit, actual emission increases are calculated by subtracting the actual emissions at those units averaged over the preceding two years (or other more representative period) from the emission levels at maximum allowed production capacity of the units. In the case of the existing equipment not undergoing a change, but whose emission levels could be affected by the change at the facility (e.g., because of increased demand for steam and other products), emissions increases should be calculated as the worst case increases that could occur at those existing units if the new or modified units were to operate at their maximum permitted capacity. The company should provide conclusive evidence that all potential emissions increases associated with the operation of the project are accounted for within the New Source Review application provided to you for review.

If you have questions or comments concerning this matter, please feel free to contact me at (214) 665-6656 or Mr. Rick Barrett of my staff at (214) 665-7227.

Sincerely yours,

Rebecca Weber
Associate Director for Air
Multimedia Planning and
Permits Division

Enclosure

February 24, 2005

(AR-18J)

Steve Dunn
NSR Team Leader
Wisconsin Department of Natural Resources
Bureau of Air Management
101 South Webster Street
Box 7921
Madison, Wisconsin 53707-7921

Re: Request for a PSD Applicability Determination for Murphy Oil, Superior, Wisconsin

Dear Mr. Dunn:

Thank you for your letter dated August 14, 2003, regarding the regulatory aspects of a potential project at the Murphy Oil USA (Murphy) facility in Superior, Wisconsin.

Your letter requests the United States Environmental Protection Agency (EPA) to provide guidance on how to calculate the net emissions increase from the boilers from a proposed project at the Murphy facility, which is a major source under the Part 70 and Prevention of Significant Deterioration (PSD) programs. The situation at the facility is described in your letter as follows:

> Murphy presently operates four oil/gas fired boilers at the Superior refinery with a reported steam capacity of slightly less than 140,000 pounds steam/hour. The minimum steam load required to operate the refinery processes is 80,000 pounds steam per hour with additional steam being primarily used in cold weather to keep process units and other equipment warm. Additionally, Murphy presently has in-place steam turbine back-ups for many electric pumps which could, if all were operated, use an additional 80,000 pounds steam per hour. The refinery reports that the boilers have, in the past 24 months, operated at full-capacity producing 140,000 pounds of steam per hour. This operation has been due to both cold weather and decisions by Murphy to operate additional steam turbines.

At issue is the method for calculating the “net emissions increase” resulting from increased utilization of upstream boilers due to projects that Murphy may undertake at the

facility. You characterize the project as "a non-exempt physical change (i.e. modification) to a process unit which does not involve any physical changes to the boiler," and point out that the proposed project would increase the steam needed to operate a process unit, and thus increase the minimum steam load at the refinery. Your request attaches a letter from Murphy which cites various site-specific evaluations by EPA, but provides few details on the actual proposed project at issue. In its letter, Murphy discusses their views regarding the de-bottlenecking concept, and argues that what it proposes constitutes "increased utilization" that would ignore emissions increases from the boilers.

We communicated with your office and with Murphy in November 2004, about the lack of specific information that the company has provided concerning the proposed project. We recently received some additional information from Murphy, as well as a copy of Wisconsin Department of Natural Resource's (WDNR) February 26, 2003 determination that Murphy's application is subject to review under the PSD program (ch. NR 405, Wis. Adm. Code). It is our understanding that Murphy disagrees with your determination, and has asked WDNR to seek EPA's input on the case. Accordingly, we provide you with the guidance below.

As a preliminary matter, we note that air emissions from Murphy's facility are governed by the Wisconsin State Implementation Plan (SIP) approved PSD program. The Wisconsin PSD program was approved by EPA on May 27, 1999, and does not include later federal changes to the New Source Review (NSR) regulations. Under the Wisconsin SIP, future emissions of modified non-electric utility steam generating units are calculated using the "actual to potential to emit" (PTE) method. We emphasize that NSR/PSD applicability calculations are governed by the applicability criteria in the currently approved and applicable SIPs, and recognize that States have the primary responsibility for determining how the SIP-approved NSR/PSD program applies to facilities within their jurisdiction. While EPA is providing input and guidance, we will defer to WDNR's final decision as long as it comports with applicable law, regulations and Agency guidance.

EPA provides site-specific responses on permitting issues[1]. We

[1] The prior EPA analyses cited in Murphy's letter were also specific to the facilities and projects presented to the Agency in those cases. In one case, the Agency modified its determination when it became aware of new information about the facility at issue: the April 10, 1992 determination for the Hoechst Celanese facility was superseded by a March 14, 1997 letter that stressed the need for details on

note that the actual project submitted to WDNR for determination may differ from the project hypothetically described in the correspondence from Murphy attached to your August 14, 2003 letter. Murphy's letter does not provide sufficient details about the history of the current operations or the proposed changes and project(s) that are needed in order to make a determination.[2] Among other things, the submittal lacks information on the following: the affected units at the facility; the permit and/or other limits that apply; the duration and frequency of operation at maximum capacity of the steam generating units involved; current and historical production levels; other equipment, pumps, structures and processes that have been and will be involved or affected, and their history; the past and proposed emissions; the pollutants; and how the steam is being re-allocated. The details of the proposed project need to be fleshed out in order to make a determination. Based on what we have been presented, EPA generally agrees with WDNR's analysis in this matter, and provides the guidance below in order to assist you as you make a final determination once you receive the relevant information. We will offer you further guidance then, if it would be helpful in ensuring that the final decision comports with applicable law, regulations and guidance.

As you are aware, EPA's regulations define a "major modification" as one in which a physical change or a change in the method of operation of a major stationary source results in a significant net emissions increase. 40 C.F.R. 52.21(b)(2).[3] The total increase in emissions that will result from the proposed changes at the source includes: (1) increases occurring at all new or modified units, and (2) any other increases at existing emissions units not being modified which could experience emissions increases as a result of the change.

With respect to the general concepts, the modification scenario as presented by Murphy's May 13, 2003 letter does not appear to fall within the concept of "debottlenecking." EPA's NSR/PSD

---

the proposed project.

[2] Omitted information about a proposed project vitiates regulatory determinations. In a case involving this same company, a Court held that Murphy withheld relevant information from WDNR regarding NSR/PSD aspects of a proposed modification of a distillate unifier. See U.S. v. Murphy Oil USA, Inc. , 155 F. Supp. 2d 1117 (W.D.Wisc., August 1, 2001).

[3] The Wisconsin SIP defines **"**major modification" in 405.02(21) as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any air contaminant subject to regulation under the act."

policies define "debottlenecking" to apply to a unit that has not been modified, but which experiences an increase in its effective capacity due to the removal of a capacity limitation on an associated unit.[4] According to the information provided, the proposed project involves an increase in the boiler units' normal production of steam, not removal of capacity limitations. Emissions resulting from "increased utilization" of the boiler as part of the proposed project must be accounted for as set forth in the following paragraphs.

In determining whether a proposed change will be a major modification and will trigger PSD requirements, we calculate the total increase in emissions that will result from the proposed changes at the source. If all of the units affected by the project, not just those physically modified, collectively emit increased emissions in excess of the significance thresholds, the project is subject to PSD review. The total emissions increases attributable to the project (from the boilers and modified downstream units) are counted towards PSD applicability.

Because of the effective dates of your applicable SIP rules, the relevant analysis for the emissions from the new emissions unit(s) is actual-to-potential (PTE). See In re Rochester Public Utilities, PSD Appeal No. 03-03 (EAB August 3, 2004) at pg. 17. For any new unit(s) being added as part of the proposed project, actual emissions increases are calculated by determining the emissions levels at the maximum allowed production capacity for the unit(s) and subtracting the actual emissions at those units (presumably zero) averaged over the preceding two years (or other more representative period).

For a situation where the existing boilers are not being modified, the emissions increase from the existing boilers that occurs as a direct result of the proposed project should be based on the maximum utilization for which the new unit will be permitted.[5] The emissions increases should be calculated as the worst case increases that could occur at those existing units if

---

[4] See the *New Source Review Workshop Manual* for understanding the concept of "debottlenecking." Pages A.37 and A.46 both contain examples of "debottlenecking."

[5] See September 17, 1993 letter from Jolie C. Luehrs, Chief, New Source Review Section, EPA Region 6 to Larry Devillier, Louisiana Dept. of Environmental Quality, regarding Union Carbide Chemicals and Plastics Company.

the new units were to operate at maximum capacity.[6]

If, as a result of the project, PSD significance thresholds for any of the PSD pollutants would be exceeded, then the project is subject to PSD requirements. Best Available Control Technology (BACT) will be required on all emission units that contribute to the emissions increase and are physically modified or experience a change in the method of operation. BACT would not apply to the boilers if no physical changes or change in the method of operation is planned for the boilers.

In sum, EPA defers to and generally agrees with the State's analysis, but lacks the details to provide final confirmation of the determination at this time. In order to assist you in going forward, we have clarified how applicable concepts would be applied under the federal regulations in effect at the time that the Wisconsin SIP was approved. If you obtain additional information on the project, we will be glad to offer you further guidance.

Please do not hesitate to contact Danny Marcus of my staff at (312) 353-8781, if you have any questions or comments; or to direct Murphy's attorneys to Andre Daugavietis, Associate Regional Counsel, at (312) 886-6663.

Sincerely yours,

/s/

Sam Portanova, Acting Section Chief
Air Permits Section

[6] See July 25, 2001 letter from Rebecca Weber, Associate Director for Air Multimedia Planning and Permits Division, EPA Region 6 to Bliss Higgins, Louisiana Dept. of Environmental Quality, regarding Motiva Enterprises, LLC.

Sunoco Partners Marketing & Terminals L.P.
Ethane Chilling Expansion
February 2022
Fugitive Component Emissions

Area	Equipment Type	Service	Emission Factor (kg/hr/source)[a]	Fluid 1 Ethane	Fluid 3 Natural Gas / Fuel Gas	Fluid 6 Flare Gas	Component Counts	Control Efficiency for LDAR Monitored Components	VOC Emissions (tons/year)	CO_2e Emissions (tons/year)[e]
Ethane Chilling System	Valves	Gas[b]	0.00597	377	176	18	571	0%	0.43	267.93
		Light Liquid[c]	0.00403	221	0		221	0%	0.17	6.45
		Heavy Liquid[d]	0.00023				0	0%	0.00	0.00
	Pump Seal Valves	Light Liquid[c]	0.00403				0	0%	0.00	0.00
		Heavy Liquid[d]	0.00023				0	0%	0.00	0.00
	Pump Seal Connectors	All	0.00183				0	0%	0.00	0.00
		Gas[b]	0.00597				0	0%	0.00	0.00
	Analyzer Valves	Light Liquid[c]	0.00403				0	0%	0.00	0.00
		Heavy Liquid[d]	0.00023				0	0%	0.00	0.00
	Analyzer Connectors	All	0.00183				0	0%	0.00	0.00
		Gas[b]	0.00597				0	0%	0.00	0.00
	Sample Station Valves	Light Liquid[c]	0.00403				0	0%	0.00	0.00
		Heavy Liquid[d]	0.00023				0	0%	0.00	0.00
	Sample Station Connectors	All	0.00183				0	0%	0.00	0.00
	Pump Seals	Light Liquid[c]	0.0199				0	0%	0.00	0.00
		Heavy Liquid[d]	0.00862				0	0%	0.00	0.00
	Compressor Seals	Gas[b]	0.228	8	0		8	0%	0.35	13.21
	Pressure Relief Valves	Gas[b]	0.104	20	0		20	0%	0.40	15.06
	Connectors	All	0.00183	1913	423	60	2,396	0%	0.68	217.39
	Open-ended Lines	All	0.0017				0	0%	0.00	0.00
	Sampling Connections	All	0.015				0	0%	0.00	0.00
TOTALS									**2.04**	**520.05**

Fluid Speciation for Fugitive Source Systems			
Speciation[f]	**Fluid 1 Ethane**	**Fluid 3 Natural Gas / Fuel Gas**	**Fluid 6 Flare Gas**
Methane	3.0%	90.0%	90.0%
Ethane	95.0%	10.0%	10.0%
Propane	2.0%	0.0%	0.0%
i-Butane	0.0%	0.0%	0.0%
i-Pentane	0.0%	0.0%	0.0%
Total VOC	**2.0%**	**0.0%**	**0.0%**
Total GHG	**3.0%**	**90.0%**	**90.0%**

[a] Emission Factors from EPA's *Procotol for Equipment Leak Emission Estimates,* EPA-453/R-95-017, Table 2-1.

[b] Gas/vapor - material in a gaseous state at operating conditions.

[c] Light liquid - material in a liquid state in which the sum of the concentration of individual constituents with a vapor pressure over 0.3 kilopascals (kPa) at 20 °C is greater than or equal to 20 weight percent.

[d] Heavy liquid - not in gas/vapor service or light liquid service.

[e] The global warming potential of methane is 25 from 40 CFR Part 98, Table A-1.

[f] The composition (weight %) is an engineering estimate only and should not be considered a permit representation.

Energy Transfer Marketing & Terminals
Ethane Chilling Expansion Project
April 2023
Fugitive Component Emissions, Screening Methodology

New Fugitive Equipment Component Counts (total for each)				
Component Category	**Component**	**Component Counts (Units/Streams in VOC service and in LDAR Program)**		
		Fluid 2 Propane	**Fluid 4 MR Vapor**	**Fluid 5 MR Liquid**
Valves	Gas Valves	541	140	0
	Light Liquid Valves	267	0	66
	Pump Seal Valves	0	0	8
Reliefs	Pressure Relief Valves	10	4	0
Connectors	Connectors	2,073	452	224
	Analyzer Connectors	0	26	0
	Pump Seal Connectors	0	0	16
Compressor Seals	Compressor Seals	6	1	0
Pump Seals	Pump Seals	1	0	2
Open-ended Lines	Open-ended Lines	0	1	0

LDAR Screening Values[1]					
	Default 0	0-500	500-1,000	1,001-10,000	>10,000
Leak Concentration		8	777	2406	33495
Leak Rate - Gas Valves	6.78%	92.66%	0.23%	0.32%	0.01%
Leak Rate - Light Liquid Valves	10.11%	89.77%	0.03%	0.08%	0.01%
Leak Rate - Pump Seals	80.96%	18.26%	0.10%	0.57%	0.11%
Leak Rate - Connectors	0.64%	98.47%	0.36%	0.49%	0.05%
Leak Rate - Others	15.68%	65.59%	4.14%	13.14%	1.46%

1 - Based on MHIC data for the two year period from second quarter 2017 through first quarter 2019.

Screening Value Emission Factors[1]					
Component Type	**Leak Rate (kg/hr)**				
Gas Valve	6.60E-07	1.158E-05	6.243E-04	1.674E-03	2.400E-02
Light Liquid Valve	4.90E-07	6.032E-06	5.119E-08	6.514E-08	3.600E-02
Pump Seals	7.50E-06	1.062E-04	4.578E-03	1.161E-02	1.400E-01
Connectors	6.10E-07	2.222E-05	1.266E-03	3.439E-03	4.400E-02
Others[2]	7.50E-06	1.06E-04	4.58E-03	1.16E-02	1.40E-01
	Table 2-11[1]	Table 2-9[1]	Table 2-9[1]	Table 2-9[1]	Table 2-13[1]

1 - Source: "Protocol for Equipment Leak Emission Estimates", EPA-453/R-95-017

2 - The correlation for light liquid pumps can be applied to compressors, pressure relief valves, agitators, and heavy liquid pumps.

Energy Transfer Marketing & Terminals
Ethane Chilling Expansion Project
April 2023
Fugitive Component Emissions, Screening Methodology

Total Emissions Due to Fugitive Equipment (lbs)								
Component	Leak Rate (lb/yr)					Total (lbs/day)	Total (lbs/year)	Total (tons/year)
	Default 0	0-500	500-1,000	1,001-10,000	>10,000			
Gas Valves	1	141	19	70	43	**0.75**	**273.71**	**0.14**
Light Liquid Valve	0	36	0	0	22	**0.16**	**58.14**	**0.03**
Pump Seals	0	1	0	4	9	**0.04**	**14.50**	**0.01**
Connectors	0	1180	245	906	1182	**9.62**	**3513.00**	**1.76**
Others	0	28	77	619	829	**4.26**	**1553.16**	**0.78**
Total (all components)	**2**	**1386.09**	**341.07**	**1597.80**	**2085.59**	**14.83**	**5412.51**	**2.71**

Percent (%) of Total Components per Unit			
	Fluid 2 Propane	Fluid 4 MR Vapor	Fluid 5 MR Liquid
Gas Valves	79.4%	20.6%	0.0%
Light Liquid Valve	78.3%	0.0%	21.7%
Pump Seals	33.3%	0.0%	66.7%
Connectors	74.2%	17.2%	8.6%
Others	76.2%	23.8%	0.0%
Total (all components)	75.5%	16.3%	8.2%

Gas Speciation for New Fugitive Equipment			
Speciation	Fluid 2 Propane	Fluid 4 MR Vapor	Fluid 5 MR Liquid
Methane	0%	17%	1%
Ethane	2%	49%	15%
Propane	97%	18%	15%
i-Butane	1%	0%	0%
i-Pentane	0%	16%	69%
Total VOC	**98%**	**34%**	**84%**
Total GHG	**0%**	**17%**	**1%**

Emissions Summary by Component Type				
Components	Total (tons/year)	Fluid 2 Propane (TPY)	Fluid 4 MR Vapor (TPY)	Fluid 5 MR Liquid (TPY)
Gas Valves	0.14	0.11	0.03	0.00
Light Liquid Valve	0.03	0.02	0.00	0.01
Pump Seals	0.01	0.00	0.00	0.00
Connectors	1.76	1.30	0.30	0.15
Others	0.78	0.59	0.18	0.00
Total (all components)	**2.71**	**1.92**	**0.49**	**0.16**

Total VOC Percentage By Unit Stream (%)	98%	34%	84%
Total VOC Emissions By Unit Stream (TPY)	1.88	0.17	0.14

Total CO_2e Percentage By Unit Stream (%)	0%	17%	1%
Total CO_2e Emissions By Unit Stream (TPY)	0.00	2.07	0.04

Total VOC Emissions (TPY)	**1.88**	**0.17**	**0.14**
Total CO_2e Emissions (TPY)	**0.00**	**2.07**	**0.04**

MHT Natural Gas Composition: July 1, 2022 –June 30, 2023 Daily Averages

Data courtesy of Williams Pipeline Co.

Meter ID	Chrmtg	Beg Date Time	G A Eff Date	Spec Grav	Heat Fctr	Nitrogen	Carbon Dioxide	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	Hexane	Total VOCs	Hydrogen Sulfide	Smpl Dev	Smpl Type
6075	GQC06041	7/1/2022 9:00	7/1/2022	0.567	1.0288	0.228	0.042	97.553	2.107	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	7/2/2022 9:00	7/2/2022	0.567	1.0293	0.228	0.047	97.498	2.153	0.07	0.002	0.003	0	0	0	0.075	0	Chromatograph	Accumulated
6075	GQC06041	7/3/2022 9:00	7/3/2022	0.567	1.0285	0.232	0.039	97.598	2.065	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	7/4/2022 9:00	7/4/2022	0.567	1.0282	0.234	0.038	97.629	2.036	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	7/5/2022 9:00	7/5/2022	0.567	1.0281	0.235	0.037	97.64	2.026	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	7/6/2022 9:00	7/6/2022	0.567	1.0285	0.236	0.041	97.579	2.077	0.063	0.001	0.003	0	0	0	0.067	0	Chromatograph	Accumulated
6075	GQC06041	7/7/2022 9:00	7/7/2022	0.568	1.0294	0.235	0.048	97.456	2.184	0.071	0.002	0.004	0	0	0	0.077	0	Chromatograph	Accumulated
6075	GQC06041	7/8/2022 9:00	7/8/2022	0.567	1.0289	0.236	0.043	97.528	2.12	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	7/9/2022 9:00	7/9/2022	0.567	1.0289	0.236	0.045	97.526	2.121	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	7/10/2022 9:00	7/10/2022	0.567	1.0284	0.238	0.04	97.592	2.065	0.062	0.002	0.003	0	0	0	0.067	0	Chromatograph	Accumulated
6075	GQC06041	7/11/2022 9:00	7/11/2022	0.567	1.0282	0.239	0.039	97.615	2.043	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	7/12/2022 9:00	7/12/2022	0.567	1.0291	0.238	0.046	97.496	2.146	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	7/13/2022 9:00	7/13/2022	0.567	1.0293	0.235	0.045	97.481	2.164	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	7/14/2022 9:00	7/14/2022	0.567	1.0283	0.236	0.039	97.604	2.056	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	7/15/2022 9:00	7/15/2022	0.567	1.0287	0.237	0.044	97.543	2.106	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	7/16/2022 9:00	7/16/2022	0.567	1.0282	0.236	0.038	97.625	2.038	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	7/17/2022 9:00	7/17/2022	0.567	1.0284	0.238	0.041	97.585	2.069	0.063	0.001	0.003	0	0	0	0.067	0	Chromatograph	Accumulated
6075	GQC06041	7/18/2022 9:00	7/18/2022	0.567	1.0284	0.237	0.04	97.595	2.061	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	7/19/2022 9:00	7/19/2022	0.567	1.0293	0.228	0.048	97.489	2.161	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	7/20/2022 9:00	7/20/2022	0.568	1.0297	0.232	0.052	97.42	2.214	0.075	0.003	0.004	0	0	0	0.082	0	Chromatograph	Accumulated
6075	GQC06041	7/21/2022 9:00	7/21/2022	0.568	1.0294	0.232	0.049	97.461	2.18	0.072	0.002	0.004	0	0	0	0.078	0	Chromatograph	Accumulated
6075	GQC06041	7/22/2022 9:00	7/22/2022	0.568	1.0295	0.23	0.049	97.452	2.19	0.073	0.002	0.004	0	0	0	0.079	0	Chromatograph	Accumulated
6075	GQC06041	7/23/2022 9:00	7/23/2022	0.568	1.0297	0.233	0.051	97.416	2.219	0.074	0.002	0.004	0	0	0	0.080	0	Chromatograph	Accumulated
6075	GQC06041	7/24/2022 9:00	7/24/2022	0.568	1.0294	0.235	0.048	97.464	2.177	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	7/25/2022 9:00	7/25/2022	0.568	1.0294	0.234	0.048	97.458	2.185	0.07	0.002	0.003	0	0	0	0.075	0	Chromatograph	Accumulated
6075	GQC06041	7/26/2022 9:00	7/26/2022	0.567	1.0291	0.231	0.045	97.507	2.143	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	7/27/2022 9:00	7/27/2022	0.567	1.0288	0.234	0.044	97.54	2.111	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	7/28/2022 9:00	7/28/2022	0.567	1.0285	0.234	0.041	97.586	2.073	0.063	0.001	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	7/29/2022 9:00	7/29/2022	0.567	1.0292	0.229	0.046	97.494	2.159	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	7/30/2022 9:00	7/30/2022	0.567	1.0288	0.235	0.043	97.547	2.107	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	7/31/2022 9:00	7/31/2022	0.567	1.028	0.236	0.038	97.641	2.024	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	8/1/2022 9:00	8/1/2022	0.567	1.0281	0.236	0.038	97.637	2.028	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	8/2/2022 9:00	8/2/2022	0.568	1.0292	0.236	0.048	97.476	2.164	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	8/3/2022 9:00	8/3/2022	0.568	1.0296	0.23	0.049	97.448	2.197	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	8/4/2022 9:00	8/4/2022	0.568	1.0298	0.232	0.051	97.41	2.226	0.074	0.002	0.004	0	0	0	0.080	0	Chromatograph	Accumulated
6075	GQC06041	8/5/2022 9:00	8/5/2022	0.568	1.03	0.231	0.053	97.394	2.239	0.076	0.003	0.004	0	0	0	0.083	0	Chromatograph	Accumulated
6075	GQC06041	8/6/2022 9:00	8/6/2022	0.567	1.0292	0.233	0.046	97.498	2.151	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	8/7/2022 9:00	8/7/2022	0.568	1.0298	0.228	0.048	97.432	2.212	0.074	0.002	0.004	0	0	0	0.080	0	Chromatograph	Accumulated
6075	GQC06041	8/8/2022 9:00	8/8/2022	0.568	1.0303	0.232	0.051	97.351	2.28	0.079	0.003	0.004	0	0	0	0.086	0	Chromatograph	Accumulated
6075	GQC06041	8/9/2022 9:00	8/9/2022	0.568	1.0302	0.231	0.051	97.361	2.271	0.078	0.003	0.004	0	0	0	0.085	0	Chromatograph	Accumulated
6075	GQC06041	8/10/2022 9:00	8/10/2022	0.569	1.0314	0.232	0.057	97.217	2.393	0.09	0.004	0.006	0.001	0	0	0.101	0	Chromatograph	Accumulated
6075	GQC06041	8/11/2022 9:00	8/11/2022	0.568	1.0294	0.235	0.047	97.465	2.177	0.071	0.002	0.004	0	0	0	0.077	0	Chromatograph	Accumulated
6075	GQC06041	8/12/2022 9:00	8/12/2022	0.567	1.0289	0.23	0.043	97.538	2.118	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	8/13/2022 9:00	8/13/2022	0.567	1.0283	0.232	0.039	97.61	2.055	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	8/14/2022 9:00	8/14/2022	0.567	1.0281	0.235	0.038	97.639	2.027	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	8/15/2022 9:00	8/15/2022	0.567	1.028	0.235	0.038	97.65	2.017	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	8/16/2022 9:00	8/16/2022	0.567	1.0284	0.233	0.041	97.596	2.065	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	8/17/2022 9:00	8/17/2022	0.567	1.0289	0.23	0.043	97.536	2.122	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	8/18/2022 9:00	8/18/2022	0.567	1.0288	0.234	0.043	97.541	2.113	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	8/19/2022 9:00	8/19/2022	0.567	1.0287	0.231	0.042	97.56	2.098	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	8/20/2022 9:00	8/20/2022	0.567	1.0289	0.233	0.043	97.538	2.116	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	8/21/2022 9:00	8/21/2022	0.567	1.0285	0.233	0.041	97.582	2.077	0.063	0.001	0.003	0	0	0	0.067	0	Chromatograph	Accumulated
6075	GQC06041	8/22/2022 9:00	8/22/2022	0.567	1.0294	0.188	0.043	97.579	2.119	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	8/23/2022 9:00	8/23/2022	0.567	1.0285	0.213	0.039	97.628	2.056	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	8/24/2022 9:00	8/24/2022	0.567	1.0288	0.213	0.04	97.593	2.087	0.063	0.001	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	8/25/2022 9:00	8/25/2022	0.568	1.0296	0.232	0.046	97.45	2.194	0.072	0.002	0.003	0	0	0	0.077	0	Chromatograph	Accumulated
6075	GQC06041	8/26/2022 9:00	8/26/2022	0.567	1.029	0.231	0.043	97.532	2.123	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	8/27/2022 9:00	8/27/2022	0.567	1.0288	0.227	0.041	97.559	2.105	0.064	0.001	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	8/28/2022 9:00	8/28/2022	0.567	1.0288	0.232	0.043	97.543	2.113	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	8/29/2022 9:00	8/29/2022	0.567	1.0289	0.233	0.043	97.535	2.119	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	8/30/2022 9:00	8/30/2022	0.568	1.0296	0.229	0.048	97.448	2.197	0.073	0.002	0.003	0	0	0	0.078	0	Chromatograph	Accumulated
6075	GQC06041	8/31/2022 9:00	8/31/2022	0.568	1.0295	0.229	0.047	97.468	2.18	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	9/1/2022 9:00	9/1/2022	0.568	1.0295	0.232	0.045	97.462	2.184	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	9/2/2022 9:00	9/2/2022	0.567	1.0292	0.232	0.044	97.499	2.15	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	9/3/2022 9:00	9/3/2022	0.567	1.0286	0.234	0.041	97.573	2.085	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	9/4/2022 9:00	9/4/2022	0.567	1.0282	0.236	0.038	97.625	2.039	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	9/5/2022 9:00	9/5/2022	0.567	1.0284	0.231	0.039	97.6	2.065	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	9/6/2022 9:00	9/6/2022	0.567	1.0287	0.234	0.042	97.555	2.099	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	9/7/2022 9:00	9/7/2022	0.567	1.0292	0.236	0.044	97.494	2.149	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	9/8/2022 9:00	9/8/2022	0.567	1.0283	0.239	0.039	97.6	2.057	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	9/9/2022 9:00	9/9/2022	0.567	1.0282	0.239	0.038	97.616	2.044	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated

6075	GQC06041	9/10/2022 9:00	9/10/2022	0.567	1.0283	0.238	0.04	97.597	2.06	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	9/11/2022 9:00	9/11/2022	0.567	1.0282	0.238	0.039	97.613	2.046	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	9/12/2022 9:00	9/12/2022	0.567	1.0281	0.236	0.038	97.626	2.037	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	9/13/2022 9:00	9/13/2022	0.567	1.0288	0.232	0.042	97.553	2.103	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	9/14/2022 9:00	9/14/2022	0.567	1.0282	0.235	0.039	97.625	2.039	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	9/15/2022 9:00	9/15/2022	0.567	1.0282	0.233	0.039	97.622	2.043	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	9/16/2022 9:00	9/16/2022	0.567	1.0283	0.234	0.039	97.608	2.056	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	9/17/2022 9:00	9/17/2022	0.567	1.0283	0.236	0.04	97.604	2.057	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	9/18/2022 9:00	9/18/2022	0.567	1.0279	0.239	0.038	97.65	2.013	0.057	0.001	0.002	0	0	0	0.060	0	Chromatograph	Accumulated
6075	GQC06041	9/19/2022 9:00	9/19/2022	0.567	1.028	0.24	0.039	97.639	2.022	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	9/20/2022 9:00	9/20/2022	0.567	1.0284	0.233	0.04	97.603	2.059	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	9/21/2022 9:00	9/21/2022	0.567	1.0288	0.234	0.042	97.547	2.11	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	9/22/2022 9:00	9/22/2022	0.567	1.0283	0.232	0.04	97.613	2.052	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	9/23/2022 9:00	9/23/2022	0.567	1.0281	0.234	0.039	97.631	2.035	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	9/24/2022 9:00	9/24/2022	0.567	1.028	0.238	0.038	97.635	2.027	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	9/25/2022 9:00	9/25/2022	0.567	1.028	0.239	0.038	97.635	2.026	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	9/26/2022 9:00	9/26/2022	0.567	1.0283	0.243	0.041	97.595	2.055	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	9/27/2022 9:00	9/27/2022	0.567	1.0289	0.242	0.048	97.508	2.125	0.07	0.002	0.003	0	0	0	0.075	0	Chromatograph	Accumulated
6075	GQC06041	9/28/2022 9:00	9/28/2022	0.569	1.0305	0.241	0.067	97.294	2.297	0.09	0.004	0.006	0.001	0	0	0.101	0	Chromatograph	Accumulated
6075	GQC06041	9/29/2022 9:00	9/29/2022	0.567	1.0279	0.241	0.038	97.65	2.011	0.057	0.001	0.002	0	0	0	0.060	0	Chromatograph	Accumulated
6075	GQC06041	9/30/2022 9:00	9/30/2022	0.567	1.0279	0.241	0.039	97.643	2.018	0.057	0	0.002	0	0	0	0.059	0	Chromatograph	Accumulated
6075	GQC06041	10/1/2022 9:00	10/1/2022	0.567	1.0279	0.238	0.039	97.65	2.014	0.057	0	0.002	0	0	0	0.059	0	Chromatograph	Accumulated
6075	GQC06041	10/2/2022 9:00	10/2/2022	0.567	1.0282	0.242	0.044	97.594	2.054	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	10/3/2022 9:00	10/3/2022	0.567	1.0281	0.237	0.04	97.628	2.031	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	10/4/2022 9:00	10/4/2022	0.567	1.0287	0.228	0.043	97.57	2.092	0.063	0.001	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	10/5/2022 9:00	10/5/2022	0.567	1.029	0.232	0.047	97.517	2.132	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	10/6/2022 9:00	10/6/2022	0.567	1.0285	0.235	0.042	97.586	2.072	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	10/7/2022 9:00	10/7/2022	0.567	1.0281	0.239	0.04	97.623	2.036	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	10/8/2022 9:00	10/8/2022	0.567	1.0279	0.236	0.038	97.653	2.013	0.057	0.001	0.002	0	0	0	0.060	0	Chromatograph	Accumulated
6075	GQC06041	10/9/2022 9:00	10/9/2022	0.567	1.0279	0.235	0.038	97.652	2.016	0.057	0.001	0.002	0	0	0	0.060	0	Chromatograph	Accumulated
6075	GQC06041	10/10/2022 9:00	10/10/2022	0.567	1.0281	0.237	0.04	97.629	2.033	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	10/11/2022 9:00	10/11/2022	0.567	1.0284	0.236	0.042	97.591	2.065	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	10/12/2022 9:00	10/12/2022	0.567	1.0284	0.238	0.042	97.589	2.064	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	10/13/2022 9:00	10/13/2022	0.567	1.0284	0.235	0.041	97.593	2.066	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	10/14/2022 9:00	10/14/2022	0.567	1.0282	0.235	0.04	97.614	2.048	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	10/15/2022 9:00	10/15/2022	0.567	1.0285	0.236	0.043	97.573	2.08	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	10/16/2022 9:00	10/16/2022	0.567	1.0283	0.236	0.041	97.601	2.058	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	10/17/2022 9:00	10/17/2022	0.567	1.0282	0.237	0.04	97.614	2.046	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	10/18/2022 9:00	10/18/2022	0.567	1.0284	0.239	0.042	97.588	2.065	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	10/19/2022 9:00	10/19/2022	0.567	1.0288	0.238	0.045	97.529	2.118	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	10/20/2022 9:00	10/20/2022	0.567	1.029	0.231	0.044	97.518	2.135	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	10/21/2022 9:00	10/21/2022	0.567	1.0287	0.235	0.043	97.552	2.102	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	10/22/2022 9:00	10/22/2022	0.567	1.0285	0.235	0.04	97.585	2.074	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	10/23/2022 9:00	10/23/2022	0.567	1.0281	0.238	0.039	97.623	2.039	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	10/24/2022 9:00	10/24/2022	0.567	1.0282	0.236	0.039	97.622	2.041	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	10/25/2022 9:00	10/25/2022	0.567	1.028	0.239	0.038	97.633	2.029	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	10/26/2022 9:00	10/26/2022	0.567	1.028	0.238	0.038	97.644	2.02	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	10/27/2022 9:00	10/27/2022	0.567	1.028	0.236	0.038	97.638	2.027	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	10/28/2022 9:00	10/28/2022	0.567	1.0284	0.235	0.039	97.6	2.062	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	10/29/2022 9:00	10/29/2022	0.567	1.0285	0.233	0.041	97.581	2.079	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	10/30/2022 9:00	10/30/2022	0.567	1.0285	0.234	0.04	97.591	2.07	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	10/31/2022 9:00	10/31/2022	0.567	1.0285	0.232	0.04	97.585	2.077	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	11/1/2022 9:00	11/1/2022	0.567	1.0284	0.237	0.04	97.597	2.062	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	11/2/2022 9:00	11/2/2022	0.567	1.0288	0.239	0.045	97.536	2.11	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	11/3/2022 9:00	11/3/2022	0.567	1.0289	0.24	0.045	97.518	2.125	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	11/4/2022 9:00	11/4/2022	0.567	1.0285	0.24	0.043	97.572	2.078	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	11/5/2022 9:00	11/5/2022	0.567	1.0281	0.24	0.039	97.628	2.032	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	11/6/2022 9:00	11/6/2022	0.567	1.028	0.242	0.038	97.631	2.027	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	11/7/2022 9:00	11/7/2022	0.566	1.0277	0.245	0.037	97.662	1.997	0.056	0	0.002	0	0	0	0.058	0	Chromatograph	Accumulated
6075	GQC06041	11/8/2022 9:00	11/8/2022	0.57	1.0329	0.245	0.071	96.995	2.562	0.11	0.006	0.008	0.001	0.001	0.001	0.127	0	Chromatograph	Accumulated
6075	GQC06041	11/9/2022 9:00	11/9/2022	0.569	1.0307	0.242	0.064	97.26	2.345	0.08	0.004	0.005	0.001	0	0	0.090	0	Chromatograph	Accumulated
6075	GQC06041	11/10/2022 9:00	11/10/2022	0.569	1.0311	0.242	0.062	97.223	2.375	0.087	0.004	0.006	0.001	0	0	0.098	0	Chromatograph	Accumulated
6075	GQC06041	11/11/2022 9:00	11/11/2022	0.57	1.0326	0.239	0.076	97.031	2.53	0.108	0.006	0.008	0.001	0.001	0.001	0.125	0	Chromatograph	Accumulated
6075	GQC06041	11/12/2022 9:00	11/12/2022	0.571	1.0338	0.246	0.085	96.866	2.659	0.123	0.007	0.009	0.002	0.001	0.001	0.143	0	Chromatograph	Accumulated
6075	GQC06041	11/13/2022 9:00	11/13/2022	0.569	1.0311	0.241	0.065	97.221	2.367	0.094	0.004	0.006	0.001	0	0	0.105	0	Chromatograph	Accumulated
6075	GQC06041	11/14/2022 9:00	11/14/2022	0.569	1.0304	0.236	0.063	97.313	2.293	0.085	0.003	0.005	0.001	0	0	0.094	0	Chromatograph	Accumulated
6075	GQC06041	11/15/2022 9:00	11/15/2022	0.569	1.0304	0.236	0.069	97.305	2.295	0.085	0.004	0.005	0.001	0	0	0.095	0	Chromatograph	Accumulated
6075	GQC06041	11/16/2022 9:00	11/16/2022	0.569	1.0306	0.238	0.069	97.274	2.322	0.086	0.004	0.005	0.001	0	0	0.096	0	Chromatograph	Accumulated
6075	GQC06041	11/17/2022 9:00	11/17/2022	0.569	1.0304	0.237	0.065	97.305	2.297	0.085	0.004	0.005	0.001	0	0	0.095	0	Chromatograph	Accumulated
6075	GQC06041	11/18/2022 9:00	11/18/2022	0.571	1.0337	0.242	0.091	96.872	2.65	0.123	0.008	0.01	0.002	0.001	0.002	0.146	0	Chromatograph	Accumulated
6075	GQC06041	11/19/2022 9:00	11/19/2022	0.572	1.0352	0.247	0.098	96.672	2.817	0.139	0.009	0.012	0.002	0.001	0.002	0.165	0	Chromatograph	Accumulated
6075	GQC06041	11/20/2022 9:00	11/20/2022	0.571	1.034	0.248	0.088	96.835	2.681	0.125	0.008	0.01	0.002	0.001	0.002	0.148	0	Chromatograph	Accumulated
6075	GQC06041	11/21/2022 9:00	11/21/2022	0.574	1.0373	0.25	0.123	96.371	3.059	0.164	0.011	0.014	0.003	0.002	0.003	0.197	0	Chromatograph	Accumulated
6075	GQC06041	11/22/2022 9:00	11/22/2022	0.572	1.0354	0.247	0.102	96.652	2.832	0.14	0.009	0.011	0.002	0.001	0.003	0.166	0	Chromatograph	Accumulated
6075	GQC06041	11/23/2022 9:00	11/23/2022	0.57	1.0321	0.242	0.075	97.091	2.469	0.104	0.006	0.008	0.001	0.001	0.001	0.121	0	Chromatograph	Accumulated

6075	GQC06041	11/24/2022 9:00	11/24/2022	0.569	1.0311	0.24	0.063	97.23	2.359	0.094	0.005	0.006	0.001	0	0.001	0.107	0	Chromatograph	Accumulated
6075	GQC06041	11/25/2022 9:00	11/25/2022	0.569	1.0307	0.241	0.062	97.274	2.32	0.09	0.005	0.006	0.001	0	0.001	0.103	0	Chromatograph	Accumulated
6075	GQC06041	11/26/2022 9:00	11/26/2022	0.569	1.0307	0.243	0.065	97.274	2.315	0.09	0.005	0.006	0.001	0	0.001	0.103	0	Chromatograph	Accumulated
6075	GQC06041	11/27/2022 9:00	11/27/2022	0.569	1.0309	0.24	0.069	97.245	2.336	0.095	0.006	0.007	0.001	0.001	0.001	0.111	0	Chromatograph	Accumulated
6075	GQC06041	11/28/2022 9:00	11/28/2022	0.569	1.0312	0.239	0.067	97.216	2.37	0.095	0.005	0.006	0.001	0	0.001	0.108	0	Chromatograph	Accumulated
6075	GQC06041	11/29/2022 9:00	11/29/2022	0.57	1.0318	0.239	0.073	97.135	2.436	0.102	0.006	0.007	0.001	0.001	0.001	0.118	0	Chromatograph	Accumulated
6075	GQC06041	11/30/2022 9:00	11/30/2022	0.569	1.0308	0.236	0.063	97.272	2.328	0.09	0.004	0.006	0.001	0	0.001	0.102	0	Chromatograph	Accumulated
6075	GQC06041	12/1/2022 9:00	12/1/2022	0.572	1.0355	0.248	0.092	96.661	2.826	0.144	0.01	0.012	0.003	0.002	0.002	0.173	0	Chromatograph	Accumulated
6075	GQC06041	12/2/2022 9:00	12/2/2022	0.574	1.0371	0.25	0.103	96.451	3.003	0.16	0.012	0.014	0.003	0.002	0.003	0.194	0	Chromatograph	Accumulated
6075	GQC06041	12/3/2022 9:00	12/3/2022	0.572	1.0349	0.245	0.087	96.746	2.76	0.135	0.009	0.011	0.002	0.001	0.002	0.160	0	Chromatograph	Accumulated
6075	GQC06041	12/4/2022 9:00	12/4/2022	0.571	1.0335	0.244	0.078	96.925	2.612	0.119	0.008	0.01	0.002	0.001	0.002	0.142	0	Chromatograph	Accumulated
6075	GQC06041	12/5/2022 9:00	12/5/2022	0.572	1.0348	0.242	0.091	96.737	2.777	0.131	0.008	0.01	0.002	0.001	0.002	0.154	0	Chromatograph	Accumulated
6075	GQC06041	12/6/2022 9:00	12/6/2022	0.573	1.0366	0.246	0.089	96.535	2.948	0.151	0.011	0.013	0.003	0.002	0.003	0.183	0	Chromatograph	Accumulated
6075	GQC06041	12/7/2022 9:00	12/7/2022	0.574	1.0376	0.246	0.1	96.402	3.057	0.162	0.012	0.014	0.003	0.002	0.003	0.196	0	Chromatograph	Accumulated
6075	GQC06041	12/8/2022 9:00	12/8/2022	0.576	1.0399	0.251	0.114	96.082	3.337	0.179	0.013	0.016	0.003	0.002	0.003	0.216	0	Chromatograph	Accumulated
6075	GQC06041	12/9/2022 9:00	12/9/2022	0.575	1.0393	0.25	0.11	96.152	3.281	0.172	0.012	0.015	0.003	0.002	0.003	0.207	0	Chromatograph	Accumulated
6075	GQC06041	12/10/2022 9:00	12/10/2022	0.58	1.0461	0.267	0.15	95.257	4.03	0.24	0.019	0.023	0.005	0.003	0.005	0.295	0	Chromatograph	Accumulated
6075	GQC06041	12/11/2022 9:00	12/11/2022	0.578	1.0426	0.26	0.131	95.714	3.642	0.206	0.016	0.019	0.004	0.002	0.004	0.251	0	Chromatograph	Accumulated
6075	GQC06041	12/12/2022 9:00	12/12/2022	0.578	1.0432	0.263	0.139	95.625	3.711	0.214	0.017	0.02	0.004	0.003	0.005	0.263	0	Chromatograph	Accumulated
6075	GQC06041	12/13/2022 9:00	12/13/2022	0.577	1.0422	0.263	0.133	95.775	3.568	0.213	0.017	0.02	0.004	0.003	0.005	0.262	0	Chromatograph	Accumulated
6075	GQC06041	12/14/2022 9:00	12/14/2022	0.577	1.0413	0.261	0.134	95.884	3.468	0.208	0.016	0.019	0.004	0.002	0.004	0.253	0	Chromatograph	Accumulated
6075	GQC06041	12/15/2022 9:00	12/15/2022	0.58	1.0459	0.265	0.169	95.276	3.969	0.261	0.021	0.025	0.006	0.003	0.005	0.321	0	Chromatograph	Accumulated
6075	GQC06041	12/16/2022 9:00	12/16/2022	0.578	1.0424	0.257	0.149	95.727	3.603	0.216	0.016	0.02	0.004	0.003	0.005	0.264	0	Chromatograph	Accumulated
6075	GQC06041	12/17/2022 9:00	12/17/2022	0.579	1.0443	0.264	0.155	95.457	3.852	0.223	0.017	0.021	0.004	0.003	0.005	0.273	0	Chromatograph	Accumulated
6075	GQC06041	12/18/2022 9:00	12/18/2022	0.576	1.0396	0.253	0.137	96.073	3.31	0.187	0.014	0.016	0.003	0.002	0.004	0.226	0	Chromatograph	Accumulated
6075	GQC06041	12/19/2022 9:00	12/19/2022	0.577	1.0413	0.257	0.146	95.846	3.505	0.202	0.015	0.018	0.004	0.002	0.004	0.245	0	Chromatograph	Accumulated
6075	GQC06041	12/20/2022 9:00	12/20/2022	0.579	1.0434	0.258	0.162	95.568	3.741	0.222	0.017	0.021	0.004	0.003	0.005	0.272	0	Chromatograph	Accumulated
6075	GQC06041	12/21/2022 9:00	12/21/2022	0.576	1.0402	0.253	0.134	96.017	3.368	0.189	0.014	0.017	0.003	0.002	0.004	0.229	0	Chromatograph	Accumulated
6075	GQC06041	12/22/2022 9:00	12/22/2022	0.578	1.0425	0.259	0.155	95.682	3.644	0.213	0.016	0.02	0.004	0.002	0.005	0.260	0	Chromatograph	Accumulated
6075	GQC06041	12/23/2022 9:00	12/23/2022	0.576	1.0398	0.251	0.129	96.076	3.317	0.188	0.014	0.016	0.003	0.002	0.003	0.226	0	Chromatograph	Accumulated
6075	GQC06041	12/24/2022 9:00	12/24/2022	0.575	1.0392	0.245	0.122	96.176	3.238	0.182	0.013	0.015	0.003	0.002	0.003	0.218	0	Chromatograph	Accumulated
6075	GQC06041	12/25/2022 9:00	12/25/2022	0.58	1.0452	0.258	0.159	95.424	3.833	0.263	0.022	0.025	0.006	0.004	0.007	0.327	0	Chromatograph	Accumulated
6075	GQC06041	12/26/2022 9:00	12/26/2022	0.58	1.0455	0.254	0.146	95.432	3.83	0.271	0.023	0.027	0.006	0.004	0.007	0.338	0	Chromatograph	Accumulated
6075	GQC06041	12/27/2022 9:00	12/27/2022	0.58	1.0454	0.256	0.149	95.442	3.805	0.28	0.024	0.028	0.006	0.004	0.006	0.348	0	Chromatograph	Accumulated
6075	GQC06041	12/28/2022 9:00	12/28/2022	0.579	1.0448	0.255	0.149	95.523	3.727	0.279	0.024	0.028	0.006	0.004	0.006	0.347	0	Chromatograph	Accumulated
6075	GQC06041	12/29/2022 9:00	12/29/2022	0.576	1.0403	0.25	0.127	96.066	3.292	0.215	0.017	0.02	0.004	0.003	0.004	0.263	0	Chromatograph	Accumulated
6075	GQC06041	12/30/2022 9:00	12/30/2022	0.57	1.032	0.239	0.07	97.121	2.448	0.106	0.006	0.007	0.001	0.001	0.001	0.122	0	Chromatograph	Accumulated
6075	GQC06041	12/31/2022 9:00	12/31/2022	0.571	1.0334	0.241	0.079	96.934	2.608	0.119	0.007	0.008	0.002	0.001	0.001	0.138	0	Chromatograph	Accumulated
6075	GQC06041	1/1/2023 9:00	1/1/2023	0.57	1.0328	0.241	0.077	96.998	2.556	0.112	0.006	0.007	0.001	0.001	0.001	0.128	0	Chromatograph	Accumulated
6075	GQC06041	1/2/2023 9:00	1/2/2023	0.57	1.0322	0.241	0.071	97.08	2.49	0.104	0.006	0.006	0.001	0	0.001	0.118	0	Chromatograph	Accumulated
6075	GQC06041	1/3/2023 9:00	1/3/2023	0.571	1.0336	0.242	0.075	96.905	2.647	0.114	0.007	0.007	0.001	0.001	0.001	0.131	0	Chromatograph	Accumulated
6075	GQC06041	1/4/2023 9:00	1/4/2023	0.571	1.0342	0.24	0.08	96.834	2.708	0.12	0.007	0.008	0.001	0.001	0.001	0.138	0	Chromatograph	Accumulated
6075	GQC06041	1/5/2023 9:00	1/5/2023	0.575	1.0397	0.251	0.117	96.095	3.328	0.176	0.012	0.014	0.003	0.002	0.002	0.209	0	Chromatograph	Accumulated
6075	GQC06041	1/6/2023 9:00	1/6/2023	0.575	1.0389	0.249	0.119	96.187	3.24	0.174	0.012	0.014	0.003	0.002	0.003	0.208	0	Chromatograph	Accumulated
6075	GQC06041	1/7/2023 9:00	1/7/2023	0.578	1.0431	0.26	0.142	95.637	3.693	0.221	0.016	0.019	0.004	0.002	0.004	0.266	0	Chromatograph	Accumulated
6075	GQC06041	1/8/2023 9:00	1/8/2023	0.579	1.0438	0.262	0.151	95.547	3.76	0.231	0.018	0.02	0.004	0.003	0.005	0.281	0	Chromatograph	Accumulated
6075	GQC06041	1/9/2023 9:00	1/9/2023	0.577	1.0417	0.257	0.141	95.818	3.53	0.21	0.016	0.018	0.004	0.002	0.004	0.254	0	Chromatograph	Accumulated
6075	GQC06041	1/10/2023 9:00	1/10/2023	0.577	1.0419	0.258	0.138	95.796	3.552	0.211	0.016	0.018	0.004	0.002	0.004	0.255	0	Chromatograph	Accumulated
6075	GQC06041	1/11/2023 9:00	1/11/2023	0.577	1.0417	0.257	0.138	95.824	3.525	0.211	0.016	0.018	0.004	0.002	0.004	0.255	0	Chromatograph	Accumulated
6075	GQC06041	1/12/2023 9:00	1/12/2023	0.575	1.039	0.254	0.116	96.193	3.219	0.181	0.013	0.015	0.003	0.002	0.003	0.217	0	Chromatograph	Accumulated
6075	GQC06041	1/13/2023 9:00	1/13/2023	0.578	1.0434	0.258	0.15	95.609	3.706	0.229	0.017	0.02	0.005	0.003	0.004	0.278	0	Chromatograph	Accumulated
6075	GQC06041	1/14/2023 9:00	1/14/2023	0.577	1.041	0.258	0.136	95.911	3.449	0.203	0.015	0.018	0.004	0.002	0.004	0.246	0	Chromatograph	Accumulated
6075	GQC06041	1/15/2023 9:00	1/15/2023	0.577	1.0413	0.255	0.145	95.866	3.484	0.206	0.015	0.018	0.004	0.002	0.004	0.249	0	Chromatograph	Accumulated
6075	GQC06041	1/16/2023 9:00	1/16/2023	0.577	1.041	0.256	0.141	95.906	3.451	0.204	0.015	0.018	0.004	0.002	0.004	0.247	0	Chromatograph	Accumulated
6075	GQC06041	1/17/2023 9:00	1/17/2023	0.577	1.0413	0.255	0.143	95.862	3.489	0.207	0.015	0.018	0.004	0.002	0.004	0.250	0	Chromatograph	Accumulated
6075	GQC06041	1/18/2023 9:00	1/18/2023	0.578	1.0432	0.258	0.158	95.605	3.705	0.227	0.017	0.02	0.004	0.002	0.004	0.274	0	Chromatograph	Accumulated
6075	GQC06041	1/19/2023 9:00	1/19/2023	0.577	1.0419	0.254	0.144	95.805	3.536	0.218	0.016	0.019	0.004	0.002	0.003	0.262	0	Chromatograph	Accumulated
6075	GQC06041	1/20/2023 9:00	1/20/2023	0.577	1.0417	0.255	0.146	95.812	3.527	0.215	0.016	0.018	0.004	0.002	0.004	0.259	0	Chromatograph	Accumulated
6075	GQC06041	1/21/2023 9:00	1/21/2023	0.576	1.0395	0.251	0.133	96.094	3.297	0.187	0.013	0.015	0.003	0.002	0.003	0.223	0	Chromatograph	Accumulated
6075	GQC06041	1/22/2023 9:00	1/22/2023	0.575	1.0386	0.25	0.125	96.218	3.198	0.175	0.012	0.014	0.003	0.002	0.003	0.209	0	Chromatograph	Accumulated
6075	GQC06041	1/23/2023 9:00	1/23/2023	0.575	1.0392	0.249	0.138	96.121	3.272	0.183	0.013	0.015	0.003	0.002	0.003	0.219	0	Chromatograph	Accumulated
6075	GQC06041	1/24/2023 9:00	1/24/2023	0.577	1.0409	0.254	0.148	95.901	3.457	0.199	0.014	0.017	0.004	0.002	0.004	0.240	0	Chromatograph	Accumulated
6075	GQC06041	1/25/2023 9:00	1/25/2023	0.576	1.04	0.251	0.154	95.988	3.376	0.191	0.013	0.016	0.003	0.002	0.004	0.229	0	Chromatograph	Accumulated
6075	GQC06041	1/26/2023 9:00	1/26/2023	0.576	1.0402	0.251	0.143	95.996	3.384	0.189	0.014	0.016	0.003	0.002	0.004	0.228	0	Chromatograph	Accumulated
6075	GQC06041	1/27/2023 9:00	1/27/2023	0.576	1.0398	0.25	0.145	96.043	3.335	0.189	0.013	0.016	0.003	0.002	0.004	0.227	0	Chromatograph	Accumulated
6075	GQC06041	1/28/2023 9:00	1/28/2023	0.571	1.0333	0.241	0.086	96.931	2.607	0.116	0.007	0.008	0.002	0.001	0.002	0.136	0	Chromatograph	Accumulated
6075	GQC06041	1/29/2023 9:00	1/29/2023	0.57	1.0325	0.24	0.078	97.035	2.523	0.107	0.006	0.007	0.001	0.001	0.001	0.123	0	Chromatograph	Accumulated
6075	GQC06041	1/30/2023 9:00	1/30/2023	0.571	1.0332	0.238	0.084	96.946	2.599	0.115	0.007	0.008	0.001	0.001	0.001	0.133	0	Chromatograph	Accumulated
6075	GQC06041	1/31/2023 9:00	1/31/2023	0.574	1.0369	0.246	0.115	96.445	3.008	0.156	0.011	0.012	0.003	0.002	0.003	0.187	0	Chromatograph	Accumulated
6075	GQC06041	2/1/2023 9:00	2/1/2023	0.574	1.0379	0.249	0.125	96.315	3.106	0.17	0.012	0.014	0.003	0.002	0.004	0.205	0	Chromatograph	Accumulated
6075	GQC06041	2/2/2023 9:00	2/2/2023	0.576	1.0401	0.256	0.138	96.011	3.363	0.192	0.014	0.016	0.004	0.002	0.004	0.232	0	Chromatograph	Accumulated
6075	GQC06041	2/3/2023 9:00	2/3/2023	0.576	1.0399	0.252	0.139	96.041	3.335	0.195	0.014	0.017	0.004	0.002	0.003	0.235	0	Chromatograph	Accumulated
6075	GQC06041	2/4/2023 9:00	2/4/2023	0.577	1.0418	0.255	0.151	95.803	3.527	0.217	0.016	0.019	0.004	0.003	0.005	0.264	0	Chromatograph	Accumulated
6075	GQC06041	2/5/2023 9:00	2/5/2023	0.575	1.0387	0.25	0.133	96.208	3.18	0.189	0.014	0.016	0.004	0.002	0.004	0.229	0	Chromatograph	Accumulated
6075	GQC06041	2/6/2023 9:00	2/6/2023	0.574	1.0372	0.252	0.127	96.391	3.027	0.17	0.012	0.014	0.003	0.002	0.003	0.204	0	Chromatograph	Accumulated

6075	GQC06041	2/7/2023 9:00	2/7/2023	0.577	1.0417	0.257	0.149	95.814	3.512	0.22	0.017	0.02	0.004	0.003	0.004	0.268	0	Chromatograph	Accumulated
6075	GQC06041	2/8/2023 9:00	2/8/2023	0.579	1.0439	0.264	0.16	95.516	3.77	0.237	0.019	0.022	0.005	0.003	0.005	0.291	0	Chromatograph	Accumulated
6075	GQC06041	2/9/2023 9:00	2/9/2023	0.571	1.0331	0.243	0.086	96.946	2.588	0.117	0.007	0.008	0.002	0.001	0.002	0.137	0	Chromatograph	Accumulated
6075	GQC06041	2/10/2023 9:00	2/10/2023	0.569	1.0308	0.239	0.071	97.25	2.333	0.093	0.005	0.006	0.001	0.001	0.001	0.107	0	Chromatograph	Accumulated
6075	GQC06041	2/11/2023 9:00	2/11/2023	0.57	1.0319	0.24	0.074	97.112	2.456	0.102	0.006	0.007	0.001	0.001	0.001	0.118	0	Chromatograph	Accumulated
6075	GQC06041	2/12/2023 9:00	2/12/2023	0.569	1.0316	0.236	0.07	97.168	2.414	0.098	0.005	0.006	0.001	0	0.001	0.111	0	Chromatograph	Accumulated
6075	GQC06041	2/13/2023 9:00	2/13/2023	0.571	1.0339	0.243	0.087	96.869	2.65	0.127	0.008	0.01	0.002	0.001	0.002	0.150	0	Chromatograph	Accumulated
6075	GQC06041	2/14/2023 9:00	2/14/2023	0.571	1.0334	0.24	0.081	96.933	2.604	0.12	0.008	0.009	0.002	0.001	0.002	0.142	0	Chromatograph	Accumulated
6075	GQC06041	2/15/2023 9:00	2/15/2023	0.572	1.0344	0.244	0.093	96.8	2.703	0.136	0.009	0.01	0.002	0.001	0.002	0.160	0	Chromatograph	Accumulated
6075	GQC06041	2/16/2023 9:00	2/16/2023	0.571	1.0337	0.243	0.087	96.883	2.635	0.128	0.008	0.009	0.002	0.001	0.002	0.150	0	Chromatograph	Accumulated
6075	GQC06041	2/17/2023 9:00	2/17/2023	0.571	1.0338	0.246	0.083	96.884	2.636	0.128	0.008	0.01	0.002	0.001	0.002	0.151	0	Chromatograph	Accumulated
6075	GQC06041	2/18/2023 9:00	2/18/2023	0.569	1.0313	0.237	0.074	97.191	2.383	0.099	0.005	0.006	0.001	0.001	0.001	0.113	0	Chromatograph	Accumulated
6075	GQC06041	2/19/2023 9:00	2/19/2023	0.57	1.0324	0.239	0.085	97.055	2.488	0.114	0.007	0.008	0.002	0.001	0.002	0.134	0	Chromatograph	Accumulated
6075	GQC06041	2/20/2023 9:00	2/20/2023	0.571	1.0331	0.24	0.093	96.95	2.573	0.122	0.008	0.009	0.002	0.001	0.002	0.144	0	Chromatograph	Accumulated
6075	GQC06041	2/21/2023 9:00	2/21/2023	0.57	1.0321	0.24	0.079	97.095	2.46	0.108	0.006	0.007	0.001	0.001	0.001	0.124	0	Chromatograph	Accumulated
6075	GQC06041	2/22/2023 9:00	2/22/2023	0.569	1.0314	0.238	0.074	97.178	2.397	0.099	0.005	0.006	0.001	0.001	0.001	0.113	0	Chromatograph	Accumulated
6075	GQC06041	2/23/2023 9:00	2/23/2023	0.57	1.032	0.24	0.079	97.103	2.456	0.105	0.006	0.007	0.001	0.001	0.001	0.121	0	Chromatograph	Accumulated
6075	GQC06041	2/24/2023 9:00	2/24/2023	0.575	1.0388	0.252	0.137	96.167	3.228	0.18	0.013	0.015	0.003	0.002	0.003	0.216	0	Chromatograph	Accumulated
6075	GQC06041	2/25/2023 9:00	2/25/2023	0.574	1.0376	0.254	0.125	96.325	3.097	0.165	0.012	0.013	0.003	0.002	0.004	0.199	0	Chromatograph	Accumulated
6075	GQC06041	2/26/2023 9:00	2/26/2023	0.575	1.0387	0.255	0.135	96.181	3.214	0.178	0.013	0.015	0.003	0.002	0.004	0.215	0	Chromatograph	Accumulated
6075	GQC06041	2/27/2023 9:00	2/27/2023	0.575	1.0382	0.252	0.134	96.252	3.152	0.174	0.012	0.014	0.003	0.002	0.003	0.208	0	Chromatograph	Accumulated
6075	GQC06041	2/28/2023 9:00	2/28/2023	0.576	1.0401	0.256	0.147	95.993	3.368	0.195	0.014	0.017	0.004	0.002	0.004	0.236	0	Chromatograph	Accumulated
6075	GQC06041	3/1/2023 9:00	3/1/2023	0.569	1.0316	0.242	0.074	97.158	2.409	0.1	0.006	0.007	0.001	0.001	0.002	0.117	0	Chromatograph	Accumulated
6075	GQC06041	3/2/2023 9:00	3/2/2023	0.571	1.0338	0.244	0.092	96.852	2.664	0.125	0.008	0.009	0.002	0.001	0.002	0.147	0	Chromatograph	Accumulated
6075	GQC06041	3/3/2023 9:00	3/3/2023	0.573	1.0361	0.245	0.106	96.561	2.913	0.148	0.01	0.012	0.003	0.002	0.003	0.178	0	Chromatograph	Accumulated
6075	GQC06041	3/4/2023 9:00	3/4/2023	0.574	1.037	0.249	0.109	96.443	3.008	0.158	0.011	0.013	0.003	0.002	0.003	0.190	0	Chromatograph	Accumulated
6075	GQC06041	3/5/2023 9:00	3/5/2023	0.575	1.0384	0.255	0.116	96.275	3.137	0.178	0.014	0.015	0.004	0.002	0.004	0.217	0	Chromatograph	Accumulated
6075	GQC06041	3/6/2023 9:00	3/6/2023	0.573	1.0359	0.246	0.104	96.586	2.888	0.147	0.01	0.011	0.003	0.001	0.003	0.175	0	Chromatograph	Accumulated
6075	GQC06041	3/7/2023 9:00	3/7/2023	0.576	1.0405	0.259	0.144	95.945	3.415	0.196	0.014	0.017	0.004	0.002	0.003	0.236	0	Chromatograph	Accumulated
6075	GQC06041	3/8/2023 9:00	3/8/2023	0.577	1.0416	0.263	0.147	95.802	3.538	0.206	0.016	0.018	0.004	0.002	0.004	0.250	0	Chromatograph	Accumulated
6075	GQC06041	3/9/2023 9:00	3/9/2023	0.574	1.0376	0.25	0.116	96.352	3.09	0.161	0.011	0.013	0.003	0.002	0.003	0.193	0	Chromatograph	Accumulated
6075	GQC06041	3/10/2023 9:00	3/10/2023	0.571	1.0337	0.241	0.081	96.88	2.662	0.116	0.007	0.008	0.002	0.001	0.002	0.136	0	Chromatograph	Accumulated
6075	GQC06041	3/11/2023 9:00	3/11/2023	0.572	1.0347	0.245	0.085	96.761	2.761	0.126	0.008	0.01	0.002	0.001	0.002	0.149	0	Chromatograph	Accumulated
6075	GQC06041	3/12/2023 9:00	3/12/2023	0.572	1.0346	0.246	0.088	96.767	2.744	0.131	0.008	0.01	0.002	0.001	0.002	0.154	0	Chromatograph	Accumulated
6075	GQC06041	3/13/2023 9:00	3/13/2023	0.571	1.0343	0.246	0.085	96.806	2.714	0.126	0.008	0.009	0.002	0.001	0.002	0.148	0	Chromatograph	Accumulated
6075	GQC06041	3/14/2023 9:00	3/14/2023	0.575	1.0384	0.259	0.117	96.234	3.188	0.167	0.012	0.014	0.003	0.002	0.003	0.201	0	Chromatograph	Accumulated
6075	GQC06041	3/15/2023 9:00	3/15/2023	0.574	1.0378	0.257	0.12	96.302	3.124	0.163	0.012	0.014	0.003	0.002	0.003	0.197	0	Chromatograph	Accumulated
6075	GQC06041	3/16/2023 9:00	3/16/2023	0.574	1.0371	0.254	0.113	96.41	3.036	0.156	0.011	0.013	0.003	0.002	0.003	0.188	0	Chromatograph	Accumulated
6075	GQC06041	3/17/2023 9:00	3/17/2023	0.571	1.0335	0.245	0.086	96.894	2.635	0.119	0.007	0.009	0.002	0.001	0.002	0.140	0	Chromatograph	Accumulated
6075	GQC06041	3/18/2023 9:00	3/18/2023	0.573	1.036	0.246	0.112	96.547	2.923	0.145	0.009	0.011	0.002	0.001	0.002	0.170	0	Chromatograph	Accumulated
6075	GQC06041	3/19/2023 9:00	3/19/2023	0.573	1.0354	0.247	0.112	96.613	2.86	0.142	0.009	0.011	0.002	0.001	0.002	0.167	0	Chromatograph	Accumulated
6075	GQC06041	3/20/2023 9:00	3/20/2023	0.574	1.0376	0.255	0.117	96.341	3.094	0.161	0.011	0.013	0.003	0.002	0.003	0.193	0	Chromatograph	Accumulated
6075	GQC06041	3/21/2023 9:00	3/21/2023	0.569	1.0305	0.241	0.063	97.297	2.299	0.087	0.005	0.005	0.001	0.001	0.001	0.100	0	Chromatograph	Accumulated
6075	GQC06041	3/22/2023 9:00	3/22/2023	0.567	1.0283	0.238	0.043	97.6	2.054	0.061	0.002	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	3/23/2023 9:00	3/23/2023	0.567	1.0289	0.235	0.047	97.518	2.128	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	3/24/2023 9:00	3/24/2023	0.567	1.0286	0.237	0.045	97.552	2.097	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	3/25/2023 9:00	3/25/2023	0.567	1.0286	0.234	0.044	97.561	2.093	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	3/26/2023 9:00	3/26/2023	0.567	1.0288	0.238	0.048	97.527	2.11	0.069	0.003	0.003	0	0	0	0.075	0	Chromatograph	Accumulated
6075	GQC06041	3/27/2023 9:00	3/27/2023	0.568	1.0294	0.235	0.052	97.462	2.17	0.074	0.003	0.004	0	0	0	0.081	0	Chromatograph	Accumulated
6075	GQC06041	3/28/2023 9:00	3/28/2023	0.569	1.0309	0.235	0.062	97.254	2.352	0.087	0.004	0.005	0.001	0	0	0.097	0	Chromatograph	Accumulated
6075	GQC06041	3/29/2023 9:00	3/29/2023	0.57	1.0318	0.239	0.071	97.119	2.461	0.097	0.005	0.006	0.001	0	0.001	0.110	0	Chromatograph	Accumulated
6075	GQC06041	3/30/2023 9:00	3/30/2023	0.569	1.0304	0.247	0.059	97.296	2.309	0.081	0.004	0.005	0.001	0	0	0.091	0	Chromatograph	Accumulated
6075	GQC06041	3/31/2023 9:00	3/31/2023	0.57	1.0329	0.244	0.076	96.973	2.592	0.101	0.005	0.006	0.001	0.001	0.001	0.115	0	Chromatograph	Accumulated
6075	GQC06041	4/1/2023 9:00	4/1/2023	0.57	1.0318	0.238	0.071	97.138	2.442	0.097	0.005	0.006	0.001	0.001	0.001	0.111	0	Chromatograph	Accumulated
6075	GQC06041	4/2/2023 9:00	4/2/2023	0.568	1.0294	0.24	0.052	97.443	2.183	0.074	0.003	0.004	0	0	0	0.081	0	Chromatograph	Accumulated
6075	GQC06041	4/3/2023 9:00	4/3/2023	0.568	1.0294	0.237	0.046	97.465	2.175	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	4/4/2023 9:00	4/4/2023	0.569	1.0316	0.232	0.063	97.177	2.421	0.095	0.005	0.006	0.001	0	0	0.107	0	Chromatograph	Accumulated
6075	GQC06041	4/5/2023 9:00	4/5/2023	0.568	1.0293	0.235	0.046	97.472	2.171	0.07	0.002	0.003	0	0	0	0.075	0	Chromatograph	Accumulated
6075	GQC06041	4/6/2023 9:00	4/6/2023	0.567	1.0292	0.231	0.043	97.498	2.154	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	4/7/2023 9:00	4/7/2023	0.568	1.0296	0.235	0.049	97.436	2.201	0.072	0.002	0.003	0	0	0	0.077	0	Chromatograph	Accumulated
6075	GQC06041	4/8/2023 9:00	4/8/2023	0.567	1.0292	0.231	0.044	97.501	2.151	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	4/9/2023 9:00	4/9/2023	0.568	1.0295	0.229	0.048	97.458	2.188	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	4/10/2023 9:00	4/10/2023	0.568	1.03	0.233	0.053	97.381	2.251	0.076	0.003	0.004	0	0	0	0.083	0	Chromatograph	Accumulated
6075	GQC06041	4/11/2023 9:00	4/11/2023	0.567	1.0292	0.231	0.045	97.499	2.151	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	4/12/2023 9:00	4/12/2023	0.567	1.0285	0.236	0.039	97.585	2.073	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	4/13/2023 9:00	4/13/2023	0.567	1.0283	0.238	0.039	97.606	2.052	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	4/14/2023 9:00	4/14/2023	0.567	1.0284	0.237	0.04	97.586	2.07	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	4/15/2023 9:00	4/15/2023	0.567	1.029	0.235	0.044	97.513	2.136	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	4/16/2023 9:00	4/16/2023	0.567	1.0287	0.237	0.041	97.557	2.096	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	4/17/2023 9:00	4/17/2023	0.567	1.029	0.238	0.045	97.505	2.138	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	4/18/2023 9:00	4/18/2023	0.57	1.033	0.241	0.076	96.972	2.585	0.111	0.006	0.007	0.001	0	0	0.125	0	Chromatograph	Accumulated
6075	GQC06041	4/19/2023 9:00	4/19/2023	0.568	1.0297	0.236	0.051	97.42	2.21	0.076	0.003	0.004	0	0	0	0.083	0	Chromatograph	Accumulated
6075	GQC06041	4/20/2023 9:00	4/20/2023	0.567	1.0289	0.234	0.043	97.535	2.117	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	4/21/2023 9:00	4/21/2023	0.567	1.0289	0.235	0.044	97.531	2.119	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	4/22/2023 9:00	4/22/2023	0.567	1.0284	0.238	0.04	97.593	2.063	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated

6075	GQC06041	4/23/2023 9:00	4/23/2023	0.567	1.0286	0.238	0.042	97.564	2.088	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	4/24/2023 9:00	4/24/2023	0.568	1.0293	0.243	0.051	97.454	2.175	0.071	0.003	0.003	0	0	0	0.077	0	Chromatograph	Accumulated
6075	GQC06041	4/25/2023 9:00	4/25/2023	0.567	1.0289	0.242	0.045	97.51	2.131	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	4/26/2023 9:00	4/26/2023	0.567	1.0288	0.235	0.047	97.535	2.112	0.066	0.002	0.003	0	0	0	0.071	0	Chromatograph	Accumulated
6075	GQC06041	4/27/2023 9:00	4/27/2023	0.569	1.0312	0.237	0.062	97.211	2.388	0.091	0.004	0.005	0.001	0	0	0.101	0	Chromatograph	Accumulated
6075	GQC06041	4/28/2023 9:00	4/28/2023	0.567	1.0292	0.233	0.05	97.489	2.154	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	4/29/2023 9:00	4/29/2023	0.567	1.029	0.23	0.047	97.518	2.132	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	4/30/2023 9:00	4/30/2023	0.568	1.0293	0.232	0.05	97.477	2.165	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	5/1/2023 9:00	5/1/2023	0.567	1.0282	0.237	0.039	97.622	2.04	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	5/2/2023 9:00	5/2/2023	0.567	1.0286	0.235	0.043	97.564	2.091	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	5/3/2023 9:00	5/3/2023	0.567	1.0292	0.232	0.047	97.496	2.152	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	5/4/2023 9:00	5/4/2023	0.567	1.0291	0.232	0.047	97.502	2.146	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	5/5/2023 9:00	5/5/2023	0.567	1.0291	0.225	0.044	97.522	2.136	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	5/6/2023 9:00	5/6/2023	0.567	1.0285	0.233	0.042	97.581	2.078	0.063	0.002	0.002	0	0	0	0.067	0	Chromatograph	Accumulated
6075	GQC06041	5/7/2023 9:00	5/7/2023	0.567	1.0284	0.236	0.041	97.594	2.062	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/8/2023 9:00	5/8/2023	0.567	1.0282	0.235	0.04	97.62	2.041	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	5/9/2023 9:00	5/9/2023	0.567	1.0282	0.235	0.04	97.617	2.044	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	5/10/2023 9:00	5/10/2023	0.567	1.0281	0.236	0.039	97.628	2.034	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	5/11/2023 9:00	5/11/2023	0.567	1.0283	0.235	0.041	97.602	2.056	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/12/2023 9:00	5/12/2023	0.567	1.0281	0.237	0.039	97.629	2.032	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	5/13/2023 9:00	5/13/2023	0.567	1.0281	0.236	0.039	97.629	2.032	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	5/14/2023 9:00	5/14/2023	0.567	1.0281	0.24	0.04	97.622	2.035	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	5/15/2023 9:00	5/15/2023	0.567	1.028	0.242	0.04	97.629	2.027	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	5/16/2023 9:00	5/16/2023	0.566	1.0278	0.242	0.037	97.657	2.004	0.057	0.001	0.002	0	0	0	0.060	0	Chromatograph	Accumulated
6075	GQC06041	5/17/2023 9:00	5/17/2023	0.567	1.0284	0.235	0.041	97.59	2.067	0.063	0.001	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/18/2023 9:00	5/18/2023	0.567	1.0285	0.234	0.042	97.578	2.078	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	5/19/2023 9:00	5/19/2023	0.567	1.0286	0.235	0.043	97.564	2.09	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	5/20/2023 9:00	5/20/2023	0.567	1.0285	0.235	0.042	97.575	2.08	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	5/21/2023 9:00	5/21/2023	0.567	1.0284	0.236	0.042	97.591	2.065	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/22/2023 9:00	5/22/2023	0.567	1.0283	0.238	0.043	97.59	2.064	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/23/2023 9:00	5/23/2023	0.567	1.0286	0.233	0.046	97.56	2.093	0.064	0.002	0.003	0	0	0	0.069	0	Chromatograph	Accumulated
6075	GQC06041	5/24/2023 9:00	5/24/2023	0.567	1.0291	0.234	0.051	97.495	2.147	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
6075	GQC06041	5/25/2023 9:00	5/25/2023	0.567	1.0287	0.234	0.046	97.55	2.102	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	5/26/2023 9:00	5/26/2023	0.567	1.0284	0.237	0.044	97.583	2.07	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/27/2023 9:00	5/27/2023	0.567	1.028	0.236	0.039	97.636	2.027	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	5/28/2023 9:00	5/28/2023	0.567	1.0283	0.239	0.044	97.585	2.066	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	5/29/2023 9:00	5/29/2023	0.567	1.0284	0.239	0.045	97.577	2.073	0.062	0.002	0.003	0	0	0	0.067	0	Chromatograph	Accumulated
6075	GQC06041	5/30/2023 9:00	5/30/2023	0.567	1.0284	0.235	0.043	97.59	2.066	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	5/31/2023 9:00	5/31/2023	0.567	1.028	0.234	0.04	97.64	2.025	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	6/1/2023 9:00	6/1/2023	0.567	1.0284	0.233	0.041	97.601	2.06	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	6/2/2023 9:00	6/2/2023	0.567	1.0284	0.234	0.042	97.588	2.07	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	6/3/2023 9:00	6/3/2023	0.567	1.0285	0.234	0.043	97.578	2.079	0.062	0.001	0.002	0	0	0	0.065	0	Chromatograph	Accumulated
6075	GQC06041	6/4/2023 9:00	6/4/2023	0.567	1.0281	0.237	0.04	97.628	2.033	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	6/5/2023 9:00	6/5/2023	0.567	1.0279	0.236	0.039	97.652	2.013	0.057	0.001	0.002	0	0	0	0.060	0	Chromatograph	Accumulated
6075	GQC06041	6/6/2023 9:00	6/6/2023	0.567	1.0283	0.236	0.042	97.604	2.053	0.06	0.001	0.002	0	0	0	0.063	0	Chromatograph	Accumulated
6075	GQC06041	6/7/2023 9:00	6/7/2023	0.567	1.0282	0.24	0.041	97.612	2.045	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	6/8/2023 9:00	6/8/2023	0.567	1.0285	0.236	0.045	97.572	2.08	0.062	0.001	0.003	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	6/9/2023 9:00	6/9/2023	0.567	1.0281	0.236	0.04	97.626	2.036	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	6/10/2023 9:00	6/10/2023	0.567	1.028	0.236	0.039	97.641	2.024	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	6/11/2023 9:00	6/11/2023	0.567	1.0284	0.238	0.044	97.582	2.07	0.062	0.002	0.002	0	0	0	0.066	0	Chromatograph	Accumulated
6075	GQC06041	6/12/2023 9:00	6/12/2023	0.567	1.0281	0.237	0.042	97.618	2.04	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	6/13/2023 9:00	6/13/2023	0.567	1.0286	0.234	0.046	97.566	2.086	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	6/14/2023 9:00	6/14/2023	0.567	1.0282	0.235	0.042	97.62	2.04	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	6/15/2023 9:00	6/15/2023	0.567	1.0285	0.233	0.044	97.575	2.081	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	6/16/2023 9:00	6/16/2023	0.567	1.0281	0.236	0.042	97.62	2.04	0.059	0.001	0.002	0	0	0	0.062	0	Chromatograph	Accumulated
6075	GQC06041	6/17/2023 9:00	6/17/2023	0.567	1.0284	0.236	0.043	97.584	2.071	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	6/18/2023 9:00	6/18/2023	0.567	1.028	0.239	0.041	97.63	2.029	0.058	0.001	0.002	0	0	0	0.061	0	Chromatograph	Accumulated
6075	GQC06041	6/19/2023 9:00	6/19/2023	0.567	1.0284	0.24	0.046	97.569	2.079	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	6/20/2023 9:00	6/20/2023	0.568	1.0292	0.234	0.051	97.479	2.161	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	6/21/2023 9:00	6/21/2023	0.567	1.0288	0.237	0.05	97.516	2.125	0.067	0.002	0.003	0	0	0	0.072	0	Chromatograph	Accumulated
6075	GQC06041	6/22/2023 9:00	6/22/2023	0.567	1.0283	0.235	0.043	97.598	2.06	0.061	0.001	0.002	0	0	0	0.064	0	Chromatograph	Accumulated
6075	GQC06041	6/23/2023 9:00	6/23/2023	0.568	1.0292	0.238	0.055	97.463	2.168	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	6/24/2023 9:00	6/24/2023	0.567	1.0284	0.241	0.046	97.567	2.079	0.063	0.002	0.003	0	0	0	0.068	0	Chromatograph	Accumulated
6075	GQC06041	6/25/2023 9:00	6/25/2023	0.567	1.0287	0.237	0.048	97.539	2.107	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	6/26/2023 9:00	6/26/2023	0.567	1.0288	0.238	0.046	97.526	2.12	0.065	0.002	0.003	0	0	0	0.070	0	Chromatograph	Accumulated
6075	GQC06041	6/27/2023 9:00	6/27/2023	0.568	1.0292	0.235	0.053	97.471	2.166	0.069	0.002	0.003	0	0	0	0.074	0	Chromatograph	Accumulated
6075	GQC06041	6/28/2023 9:00	6/28/2023	0.568	1.0293	0.236	0.056	97.451	2.18	0.071	0.002	0.003	0	0	0	0.076	0	Chromatograph	Accumulated
6075	GQC06041	6/29/2023 9:00	6/29/2023	0.568	1.0294	0.236	0.054	97.448	2.185	0.072	0.002	0.003	0	0	0	0.077	0	Chromatograph	Accumulated
6075	GQC06041	6/30/2023 9:00	6/30/2023	0.567	1.029	0.234	0.052	97.499	2.143	0.068	0.002	0.003	0	0	0	0.073	0	Chromatograph	Accumulated
			Averages:	**0.570**	**1.032**	**0.240**	**0.068**	**97.138**	**2.440**	**0.100**	**0.005**	**0.007**	**0.001**	**0.001**	**0.001**	**0.114**	**0.000**		

New cells added to GC data by DEP

Highest daily VOC content

VOC and GHG PTEs for Piping and Fugitive Emissions Components Not in VOC Service

Area	Equipment Type	Service	Emission Factor (kg/hr/source)[a]	Fluid 1 Ethane	Fluid 3 Natural Gas / Fuel Gas	Fluid 6 Flare Gas	Component Counts	VOC Emissions (tons/year)	CO_2e Emissions (tons/year)[b]
Ethane Chilling System	Valves	Gas	0.00597	377	176	18	571	0.47	280.89
		Light Liquid	0.00403	221	0	0	221	0.17	6.45
	Compressor Seals	Gas	0.228	8	0	0	8	0.35	13.21
	Pressure Relief Valves	Gas	0.104	20	0	0	20	0.40	15.06
	Connectors	All	0.00183	1913	423	60	2,396	0.70	227.28
			TOTALS	2539	599	78	3216	**2.10**	**542.89**

Speciated Composition Information

Constituents	Fluid 1 Ethane	Fluid 3 Natural Gas / Fuel Gas	Fluid 6 Flare Gas
Methane	3.0%	94.634%	94.634%
Ethane	95.0%	4.455%	4.455%
Propane	2.0%	0.267%	0.267%
i-Butane	0.0%	0.018%	0.018%
n-Butane	0.0%	0.023%	0.023%
i-Pentane	0.0%	0.004%	0.004%
n-Pentane	0.0%	0.003%	0.003%
Hexane	0.0%	0.005%	0.005%
Total VOCs	**2.0%**	**0.320%**	**0.320%**
Total GHGs	**3.0%**	**94.634%**	**94.634%**

[a] Emission Factors from EPA's *Procotol for Equipment Leak Emission Estimates,* EPA-453/R-95-017, Table 2-1.

[b] The global warming potential of methane from 40 CFR Part 98, Table A-1, is 25.

Sunoco Partners Marketing & Terminals L.P.
Ethane Chilling Expansion
February 2022
Flare Emissions Summary

Cold Flares	MMBtu/hr	Emissions (TPY)				
		NO_x	CO	VOC	SO_2	CO_2e
C01 HP Cold Flare						
Sweep Continuous Flows	0.49	0.1458	0.6645	0.0095	0.0013	298.74
Operational & Maintenance Flows	1.96E-05	2.67E-05	2.67E-05	2.64E-05	0	1.20E-02
C01 LP Cold Flare						
Operational & Maintenance Flows	0.64	0.1897	0.8647	0.4281	0	389.97
C04 HP Cold Flare						
Operational & Maintenance Flows	0.05	0.0161	0.0733	0.0502	0	33.04
Total	**1.18**	**0.35**	**1.60**	**0.49**	**0.001**	**721.75**

Sunoco Partners Marketing & Terminals L.P.
Ethane Chilling Expansion
February 2022
Flare Emissions - Sweep Flow

			C01 HP Cold Flare		
Sweep Gas Flow			**Value**	**Units**	**Notes**
[A]	Natural Gas Mass Flow	=	190,530	lb/yr	Engineering Analysis
[B]	Natural Gas HHV	=	22,500	Btu/lb	Literature Value
[C]	Heating Duty (Natural Gas)	=	4,287	MMBtu/yr	= [A] * [B] /1000000
[D]	Operating Hours	=	8,760	hrs/yr	Assumption
[E]	SPMT Heating Duty	=	0.49	MMBtu/hr	= [C] / [D]
Flare Emissions			**Value**	**Units**	**Notes**
[F]	NO_x Emission Factor	=	0.068	lb/MMBtu	AP-42 Ch 13.5, Table 13.5-1
[G1]	VOC Destruction Efficiency	=	99%	% DRE	Compliance with 40 CFR 60.18
[G2]	VOC Content of natural gas	=	1%	% VOC	Composition Data
[H]	CO Emission Factor	=	0.31	lb/MMBtu	AP-42 Ch 13.5, Table 13.5-2 (Updated April 2015)
[I]	SO_2 Emission Factor	=	0.0006	lb/MMBtu	AP-42 Table 1.4-2 (converted to lb/MMBtu)
[J]	NO_x Emission Rate	=	0.0333	lb/hr	= [E] * [F]
[K]	VOC Emission Rate	=	0.0022	lb/hr	= [A] / [D] * (1 - [G1]) * [G2]
[L]	CO Emission Rate	=	0.1517	lb/hr	= [E] * [H]
[M]	SO_2 Emission Rate	=	2.86E-04	lb/hr	= [E] * [I]
[N]	NO_x Emissions	=	0.1458	TPY	= [J] * 8760/2000
[O]	VOC Emissions	=	0.0095	TPY	= [K] * 8760/2000
[P]	CO Emissions	=	0.6645	TPY	= [L] * 8760/2000
[Q]	SO_2 Emissions	=	0.0013	TPY	= [M] * 8760/2000
[R]	CH_4 Emission factor for natural gas	=	0.001	kg/MMBtu	40 CFR Part 98, Table C-2
[S]	N_2O Emission factor for natural gas	=	0.0001	kg/MMBtu	40 CFR Part 98, Table C-2
[T]	CO_2 Emissions	=	252	metric tons/year	40 CFR Part 98, Equation Y-3
[U]	CO_2 Emissions	=	278	TPY	Conversion
[V]	CH_4 Emissions	=	0.7525	metric tons/year	40 CFR Part 98, Equation Y-4
[W]	CH_4 Emissions	=	0.8294	TPY	Conversion
[X]	CH_4 Global Warming Potential	=	25		40 CFR Part 98, Table A-1
[Y]	N_2O Emissions	=	0.0004	metric tons/year	40 CFR Part 98, Equation Y-5
[Z]	N_2O Emissions	=	0.0005	TPY	Conversion
[AA]	N_2O Global Warming Potential	=	298		40 CFR Part 98, Table A-1
[AB]	CO_2e Emissions	=	299	TPY	= [U] + [W] * [X] + [Z] * [AA]

Sunoco Partners Marketing & Terminals L.P.
Ethane Chilling Expansion
February 2022
Flare Emissions - Operation & Maintenance Flows

			C01 HP Cold Flare	C01 LP Cold Flare		
Operational & Maintenance Flow			**Value**	**Value**	**Units**	**Notes**
[A]	Butane Mass Flow	=	0.00	0.00	lb/yr	Engineering Analysis
[B]	Ethane Mass Flow	=	3.81	123,406.50	lb/yr	Engineering Analysis
[C]	Methane Mass Flow	=	1.32	42,814.50	lb/yr	Engineering Analysis
[D]	Pentane Mass Flow	=	1.24	40,296.00	lb/yr	Engineering Analysis
[E]	Propane Mass Flow	=	1.40	45,333.00	lb/yr	Engineering Analysis
[F]	Butane HHV	=	21,640	21,640	Btu/lb	Engineering Analysis
[G]	Ethane HHV	=	22,198	22,198	Btu/lb	Engineering Analysis
[H]	Methane HHV	=	23,811	23,811	Btu/lb	Engineering Analysis
[I]	Pentane HHV	=	20,908	20,908	Btu/lb	Engineering Analysis
[L]	Propane HHV	=	21,564	21,564	Btu/lb	Engineering Analysis
[M]	Butane Heating Duty	=	0.00	0.00	MMBtu/yr	= [A] * [F] / 1,000,000
[N]	Ethane Heating Duty	=	0.08	2,739	MMBtu/yr	= [B] * [G] / 1,000,000
[O]	Methane Heating Duty	=	0.03	1,019.46	MMBtu/yr	= [C] * [H] / 1,000,000
[P]	Pentane Heating Duty	=	0.03	843	MMBtu/yr	= [D] * [I] / 1,000,000
[Q]	Propane Heating Duty	=	0.03	978	MMBtu/yr	= [E] * [L] / 1,000,000
[R]	Total Heating Duty	=	0.17	5,579	MMBtu/yr	= [M] + [N] + [O] + [P] + [Q]
[S]	Operating Hours	=	8,760	8,760	hrs/yr	Assumption
[T]	SPMT Heating Duty	=	0.00	0.64	MMBtu/hr	= [R] / [S]
Flare Emissions			**Value**	**Value**	**Units**	**Notes**
[U]	NO_x Emission Factor	=	0.068	0.068	lb/MMBtu	AP-42 Ch 13.5, Table 13.5-1
[W]	VOC Destruction Efficiency	=	98%	99%	% DRE	Compliance with 40 CFR 60.18
[X]	VOC Content of Natural Gas	=	1%	1%	% VOC	Composition Data
[Y]	CO Emission Factor	=	0.31	0.31	lb/MMBtu	AP-42 Ch 13.5, Table 13.5-2 (Updated April 2015)
[Z]	SO_2 Emission Factor (Natural Gas Only)	=	0.0006	0.0006	lb/MMBtu	Only present if Natural Gas is combusted
[AA]	NO_x Emission Rate	=	1.34E-06	0.0433	lb/hr	= [T] * [U]
[AB]	VOC Emission Rate	=	6.03E-06	0.0978	lb/hr	= (([A] + [D] + [E]) * (1 - [W])) / [S]
[AC]	CO Emission Rate	=	6.09E-06	0.1974	lb/hr	= [T] * [Y]
[AD]	SO_2 Emission Rate	=	0	0.0000	lb/hr	Only present if Natural Gas is combusted
[AE]	NO_x Emissions	=	5.85E-06	0.1897	TPY	= [AA] * 8,760 / 2,000
[AF]	VOC Emissions	=	2.64E-05	0.4281	TPY	= [AB] * 8,760 / 2,000
[AG]	CO Emissions	=	2.67E-05	0.8647	TPY	= [AC] * 8,760 / 2,000
[AH]	SO_2 Emissions	=	0	0	TPY	Only present if Natural Gas is combusted
[AI]	CH_4 Emission factor for petroleum products	=	0.0030	0.0030	kg/MMBtu	40 CFR Part 98, Table C-2
[AJ]	N_2O Emission factor for petroleum products	=	0.0006	0.0006	kg/MMBtu	40 CFR Part 98, Table C-2
[AK]	CO_2 Emissions	=	0	328	metric tons/year	40 CFR Part 98, Equation Y-3
[AL]	CO_2 Emissions	=	0	362	TPY	Conversion
[AM]	CH_4 Emissions	=	3.05E-05	0.9902	metric tons/year	40 CFR Part 98, Equation Y-4
[AN]	CH_4 Emissions	=	3.37E-05	1.0915	TPY	Conversion
[AO]	CH_4 Global Warming Potential	=	25	25		40 CFR Part 98, Table A-1
[AP]	N_2O Emissions	=	1.01E-07	0.0033	metric tons/year	40 CFR Part 98, Equation Y-5
[AQ]	N_2O Emissions	=	1.12E-07	0.0036	TPY	Conversion
[AR]	N_2O Global Warming Potential	=	298	298		40 CFR Part 98, Table A-1
[AS]	CO_2e Emissions	=	0	390	TPY	= [AL] + [AN] * [AO] + [AQ] * [AR]

Sunoco Partners Marketing & Terminals L.P.
Ethane Chilling Expansion
February 2022
Flare Emissions - Operation & Maintenance Flows

			C04 HP Cold Flare		
Operational & Maintenance Flow			**Value**	**Units**	**Notes**
[A]	Butane Mass Flow	=	100.61	lb/yr	Engineering Analysis
[B]	Ethane Mass Flow	=	8,677.49	lb/yr	Engineering Analysis
[C]	Methane Mass Flow	=	2,667.67	lb/yr	Engineering Analysis
[D]	Pentane Mass Flow	=	0.00	lb/yr	Engineering Analysis
[E]	Propane Mass Flow	=	9,937.18	lb/yr	Engineering Analysis
[F]	Butane HHV	=	21,640	Btu/lb	Engineering Analysis
[G]	Ethane HHV	=	22,198	Btu/lb	Engineering Analysis
[H]	Methane HHV	=	23,811	Btu/lb	Engineering Analysis
[I]	Pentane HHV	=	20,908	Btu/lb	Engineering Analysis
[L]	Propane HHV	=	21,564	Btu/lb	Engineering Analysis
[M]	Butane Heating Duty	=	2.18	MMBtu/yr	= [A] * [F] / 1,000,000
[N]	Ethane Heating Duty	=	192.62	MMBtu/yr	= [B] * [G] / 1,000,000
[O]	Methane Heating Duty	=	63.52	MMBtu/yr	= [C] * [H] / 1,000,000
[P]	Pentane Heating Duty	=	0.00	MMBtu/yr	= [D] * [I] / 1,000,000
[Q]	Propane Heating Duty	=	214.29	MMBtu/yr	= [E] * [L] / 1,000,000
[R]	Total Heating Duty	=	472.61	MMBtu/yr	= [M] + [N] + [O] + [P] + [Q]
[S]	Operating Hours	=	8,760	hrs/yr	Assumption
[T]	SPMT Heating Duty	=	0.05	MMBtu/hr	= [R] / [S]

Flare Emissions			**Value**	**Units**	**Notes**
[U]	NO_x Emission Factor	=	0.068	lb/MMBtu	AP-42 Ch 13.5, Table 13.5-1
[W]	VOC Destruction Efficiency	=	99%	% DRE	Compliance with 40 CFR 60.18
[X]	VOC Content of Natural Gas	=	1%	% VOC	Composition Data
[Y]	CO Emission Factor	=	0.31	lb/MMBtu	AP-42 Ch 13.5, Table 13.5-2 (Updated April 2015)
[Z]	SO_2 Emission Factor (Natural Gas Only)	=	0.0006	lb/MMBtu	Only present if Natural Gas is combusted
[AA]	NO_x Emission Rate	=	0.0037	lb/hr	= [T] * [U]
[AB]	VOC Emission Rate	=	0.0115	lb/hr	= (([A] + [D] + [E]) * (1 - [W])) / [S]
[AC]	CO Emission Rate	=	0.0167	lb/hr	= [T] * [Y]
[AD]	SO_2 Emission Rate	=	0	lb/hr	Only present if Natural Gas is combusted
[AE]	NO_x Emissions	=	0.0161	TPY	= [AA] * 8,760 / 2,000
[AF]	VOC Emissions	=	0.0502	TPY	= [AB] * 8,760 / 2,000
[AG]	CO Emissions	=	0.0733	TPY	= [AC] * 8,760 / 2,000
[AH]	SO_2 Emissions	=	0	TPY	Only present if Natural Gas is combusted
[AI]	CH_4 Emission factor for petroleum products	=	0.0030	kg/MMBtu	40 CFR Part 98, Table C-2
[AJ]	N_2O Emission factor for petroleum products	=	0.0006	kg/MMBtu	40 CFR Part 98, Table C-2
[AK]	CO_2 Emissions	=	28	metric tons/year	40 CFR Part 98, Equation Y-3
[AL]	CO_2 Emissions	=	31	TPY	Conversion
[AM]	CH_4 Emissions	=	0.0839	metric tons/year	40 CFR Part 98, Equation Y-4
[AN]	CH_4 Emissions	=	0.0925	TPY	Conversion
[AO]	CH_4 Global Warming Potential	=	25		40 CFR Part 98, Table A-1
[AP]	N_2O Emissions	=	0.0003	metric tons/year	40 CFR Part 98, Equation Y-5
[AQ]	N_2O Emissions	=	0.0003	TPY	Conversion
[AR]	N_2O Global Warming Potential	=	298		40 CFR Part 98, Table A-1
[AS]	CO_2e Emissions	=	33	TPY	= [AL] + [AN] * [AO] + [AQ] * [AR]

Energy Transfer Marketing & Terminals
Ethane Chilling Expansion
April 2023
Auxiliary Boiler Analysis - Projected Emissions

Boiler Load Analysis (PADEP Totals)

Auxiliary Boiler Steam Demand	Annualized Demand
	lbs steam/hr
Prior Aggregated Project Boiler Demand	233,535
Non-Aggregated MHIC Boiler Steam Demand (Baseload)	181,765
Total MHIC Boiler Steam Demand	**415,300**

Projected Future Steam Demands

Case	Boiler Demand (LB/HR)
Ethane Chilling Expansion	23,673

Auxiliary Boiler Emission Factors

Pollutant	2014 - 2019 Emission Factor (lb / lb steam)[1]	2018 - 2022 Emission Factor (lb / lb steam)[2]	Basis
CO	7.55E-06	4.15E-06	CEMS
NOx	3.74E-05	3.64E-05	CEMS
VOC	2.73E-06	6.90E-07	Stack Test
SO_x	4.15E-06	4.38E-06	40 CFR 75, Appendix D[2]
$PM/PM_{10}/PM_{2.5}$	1.37E-06	1.59E-06	Stack Test
H_2SO_4	5.61E-08	6.54E-08	Stack Test
CO_2e	1.89E-01	1.56E-01	40 CFR 98
Lead	6.69E-09	1.13E-08	WebFIRE
HAP	2.53E-06	3.60E-06	WebFIRE

1 - Based on the 2014-2019 boiler performance.

2 - Based on the 2018-2022 boiler performance.

3 - SOx emission factors for all units are derived from the 40 CFR 75 Appendix D pipeline natural gas default (0.0006 lb/mmbtu) and 40 CFR 75 Appendix D, Eqn. D-1h for process gas combustion

Future Expected Auxiliary Boiler Annual Emissions
Aggregated Project Incremental Emissions

Pollutant	Baseload + Prior Projects 2014 - 2019 EF (tpy)	Baseload + Prior Projects 2018 - 2022 EF (tpy)	Ethane Chilling Incremental Emissions 2014 - 2019 EF (tpy)	Ethane Chilling Incremental Emissions 2018 - 2022 EF (tpy)	Future Expected Emissions 2014 - 2019 EF (tpy)	Future Expected Emissions 2018 - 2022 EF (tpy)	Emissions Limit (tpy)
CO	6.01	3.30	0.78	0.43	14.52	7.98	27.23
NOx	29.79	29.01	3.88	3.78	71.95	70.06	92.71
VOC	2.17	0.55	0.28	0.07	5.25	1.33	5.49
SO_x	3.30	3.49	0.43	0.45	7.97	8.42	41.40
$PM/PM_{10}/PM_{2.5}$	1.09	1.26	0.14	0.16	2.63	3.05	21.94
H_2SO_4	0.04	0.05	0.01	0.01	0.11	0.13	3.15
CO_2e	150,464.24	124,116.84	19,596.39	16,164.92	363,379.65	299,749.20	NA
Lead	0.01	0.01	0.00	0.00	0.01	0.02	NA
HAP	2.01	2.86	0.26	0.37	4.85	6.92	NA

Note that the future expected emissions above represent projected utilization of the boilers for the permitted MHIC and Ethane Chilling Expansion Project. These totals do not represent the Potential to Emit (PTE) of the auxiliary boilers.

Prevention of Significant Deterioration (PSD) & New Source Review (NSR) Analyses for All Natural Gas Liquids-Related Projects at Energy Transfer Marketing & Terminals, L.P. (ETMT)—Marcus Hook Terminal

	CO	GHGs	H_2SO_4	NO_x	Pb	PM	PM_{10}	$PM_{2.5}$	SO_2	VOCs	Source Type & Other Notes
Authorizations Comprising Expanded Single Aggregated Project (in reverse chronological order)											
Plan Approval No. 23-0119K (complete application received 3/9/2022)											
Ethane Chilling Expansion Project Piping and Fugitive Emissions Components Not in VOC Service	0	542.89	0	0	0	0	0	0	0	2.10	Construction/modification of existing emissions unit: PTE because fugitive emissions not readily quantifiable
Ethane Chilling Expansion Project Piping and Fugitive Emissions Components in VOC Service	0	2.11	0	0	0	0	0	0	0	2.19	Construction/modification of existing emissions unit: PTE because fugitive emissions not readily quantifiable
West Cold Flare Incremental Emissions Increases	1.529	688.72	0	0.3355	0	0	0	0	0.0013	0.4376	No construction/modification of existing emissions unit: incremental emissions increase
Project Phoenix Cold Flare Incremental Emissions Increases	0.0733	33.04	0	0.0161	0	0	0	0	0	0.0502	No construction/modification of existing emissions unit: incremental emissions increase
Auxiliary Boilers Incremental Emissions Increases	0.430	16,175	0.00678	3.774	0.00117	0.165	0.165	0.165	0.454	0.0715	No construction/modification of existing emissions unit: incremental emissions increase
Totals	2.033	17,442	0.00678	4.126	0.00117	0.165	0.165	0.165	0.455	4.849	
De Minimis Emissions Increase (written notice received 1/4/2022)											
YZ Light Liquid Sampler Systems and Fugitive Emissions Components	0	0	0	0	0	0	0	0	0	0.0716	New emissions unit: PTE
West Warm Flare Incremental Emissions Increases	0.0059	2.5063	0	0.0013	0	0	0	0	0	0.0178	No construction/modification of existing emissions unit: incremental emissions increase
Totals	0.0059	2.5063	0	0.0013	0	0	0	0	0	0.0894	
Request for Determination No. 9332 (approved 9/3/2021)											
New Butane Truck Loading Station and Fugitive Emissions Components	0	0	0	0	0	0	0	0	0	0.024	New emissions unit: PTE
West Warm Flare Incremental Emissions Increases	0.015	6.28	0	0.0033	0	0	0	0	0	0.045	No construction/modification of existing emissions unit: incremental emissions increase
Totals	0.015	6.28	0	0.0033	0	0	0	0	0	0.069	
De Minimis Emissions Increase (written notice received 5/19/2021)											
West Warm Flare Incremental Emissions Increases (for Ethane Recycle Pump Casings)	0.00016	0	0	0.000035	0	0	0	0	0	0.00	No construction/modification of existing emissions unit: incremental emissions increase
Totals	0.00016	0	0	0.000035	0	0	0	0	0	0.00	
Request for Determination No. 9156 (approved 5/13/2021)											
Propane and Butane Truck Loading and Unloading Stations and Fugitive Emissions Components	0	0	0	0	0	0	0	0	0	0	No construction/modification of existing emissions unit: net emissions decrease
West Warm Flare Incremental Emissions Increases	0.0782	32.5175	0	0.0172	0	0	0	0	0	0.2266	No construction/modification of existing emissions unit: incremental emissions increase
Totals	0.0782	32.5175	0	0.0172	0	0	0	0	0	0.2266	
Plan Approval Nos. 23-0119E (revised) & 23-0119J (concurrently issued 2/12/2021)	101.13	243,261	0.0574	58.89	0.00684	3.87	3.66	1.82	17.49	177.22	Emissions increases determined under Plan Approval No. 23-0119E (revised), which included those under Plan Approval No. 23-0119J
Emissions Increases for Expanded Single Aggregated Project [40 CFR § 52.21(a)(2)(iv)(*c*)–(*d*)]	103.26	260,744	0.0642	63.04	0.00801	4.039	3.829	1.983	17.94	182.45	
PSD Significant Emissions Rates (tons/yr) [40 CFR § 52.21(b)(40)]	100	75,000	7	40	0.6	25	15	10	40	N/A	10 tons/yr for direct $PM_{2.5}$, but 40 tons/yr for NO_x or SO_2 based on those pollutants being precursors to PM2.5
Are Emissions Increases Significant for PSD?	Yes	Yes	No	Yes	No	No	No	Yes	No	N/A	
Authorizations Not Part of the Expanded Single Aggregated Project											PSD contemporaneous period: 10/31/2018–4/30/2026 NSR contemporaneous period: Calendar years 2022–2026
De Minimis Emissions Increase (written notice received 3/22/2019)											
West Warm Flare Incremental Emissions Increases (for C-3/4 Truck Rack Depressurization Line)	0.0010	0	0	0.00022	0	0	0	0	0	0.00301	No construction/modification of existing emissions unit: incremental emissions increase
Request for Determination No. 7548 (approved 4/11/2019)											
West Warm Flare Incremental Emissions Increases (for H-5 Truck Pressure Unloading Project)	0.0679	30.39	0	0.0149	0	0	0	0	0	0.2090	No construction/modification of existing emissions unit: incremental emissions increase
Request for Determination No. 9446 (approved 7/14/2022)											
West Warm Flare Incremental Emissions Increases (for Braskem Propylene Splitter Dryer Project)	0.2336	27.79	0	0.0429	0	0	0	0	0	0.6000	No construction/modification of existing emissions unit: incremental emissions increase
Request for Determination No. 9668 (approved 5/23/2022)											
West Warm Flare Incremental Emissions Increases (for Braskem Pulsation Dampener Dryer)	0.3388	40.07	0	0.0623	0	0	0	0	0	0.8650	No construction/modification of existing emissions unit: incremental emissions increase
Totals	0.6413	98.25	0	0.1203	0	0	0	0	0	1.6770	
Net Emissions Increases for Expanded Single Aggregated Project [40 CFR § 52.21(a)(2)(iv)(*c*)–(*d*) and (b)(3)]	103.90	260,842		63.16				1.983			
PSD Significant Net Emissions Rates (tons/yr) [40 CFR § 52.21(b)(23)]	100	75,000		40				10			10 tons/yr for direct $PM_{2.5}$, but 40 tons/yr for NO_x or SO_2 based on those pollutants being precursors to PM2.5
Are Net Emissions Increases Significant for PSD?	Yes	Yes		Yes				Yes			
Aggregated Emissions Increases for Expanded Single Aggregated Project [25 Pa. Code § 127.203(b)(1)(i)]				63.15						183.92	
NSR Significant Net Emissions Rates (tons/yr) [25 Pa. Code § 121.1: Significant, subparagraphs (ii)–(iii)]				25						25	
Are Aggregated Emissions Increases Significant for NSR?				Yes						Yes	
ERCs Required for Expanded Single Aggregated Project (1.3:1 Offset Ratio) [25 Pa. Code §§ 127.201(f) and 127.210]				82.09						239.10	
ERCs Previously Surrendered and Retired for Expanded Single Aggregated Project											
Plan Approval No. 23-0119B										34.65	
Plan Approval No. 23-0119E				32.80						56.10	
Plan Approval No. 23-0119F										17.77	
Plan Approval No. 23-0119H (portion attributable to expanded single aggregated project)										19.02	
Plan Approval No. 23-0119E (revised)				46.35						59.07	
Totals				79.15						186.61	
ERCs Still Required to Be Surrendered for Expanded Single Aggregated Project											
Plan Approval No. 23-0119E (revised)										7.18	Surrendered on 3/8/2024 and will be retired upon issuance of Plan Approval No. 23-0119K
Plan Approval No. 23-0119J										49.93	Required to be surrendered prior to commencement of operation of sources authorized under either Plan Approval, except that negative value may only be considered if sources installed under Plan Approval
Remaining ERCs to Surrender for Expanded Single Aggregated Project (under Plan Approval No. 23-0119K)				2.94						-4.62	No. 23-0119K commence operation on an earlier date than those installed under Plan Approval No. 23-0119J

5. BACT ANALYSIS

Projects triggering a significant emissions increase under the federal Prevention of Significant Deterioration (PSD) regulations require a Best Available Control Technology (BACT) analysis. As described in **Section 4.2**, based on the Aggregated Project emissions, the Ethane Chilling Expansion Project is subject to PSD for NO_2, CO, and CO_2e and is therefore required to demonstrate BACT under the requirements set-forth in section 165 (a)(4) of the Clean Air Act, 40 CFR §52.21(j). Since the MHIC is an existing facility, only new or modified emissions sources are subject to the BACT review. As described in **Section 2** of this application, no NO_2 or CO sources for the Ethane Chilling Expansion Project are new or modified. The only new or modified sources in the Ethane Chilling Expansion Project, which will emit attainment pollutants subject to PSD, will be the installation of additional fugitive components, which are a source of CO_2e emissions.

Once a project triggers PSD for GHGs, BACT (established on a CO_2e basis) must be demonstrated for all project associated emission sources. This section summarizes a top-down approach for determining GHG BACT.

In March 2011, USEPA published a GHG BACT guidance document for use by the states in performing review of applications triggering PSD for GHGs. The guidance is not a binding document, yet it provides USEPA's concepts and positions in how a BACT analysis should be performed. In this guidance, the USEPA reinforces the use of the "top-down" method for determining BACT for GHGs described below in **Section 5.1**.

As discussed in **Section 3** of this application, the only new or modified sources of GHG emissions from Ethane Chilling Expansion Project are fugitive components. Furthermore, for GHG emissions, USEPA recommends that carbon capture and sequestration (CCS) be considered for all BACT analyses. The following sections of this analysis describe each step of the top-down method for the selection of GHG BACT for the Ethane Chilling Expansion Project.

5.1 BACT Analysis Process

Each BACT analysis is conducted on a case-by-case basis, where the reviewing authority evaluates the energy, environmental, economic and other costs associated with each alternative technology, as well as the benefit of the expected reduced emissions that each technology would yield. In no event, however, can a technology be recommended that would not meet any applicable standard of performance under the New Source Performance Standards (40 CFR Part 60) or the National Emission Standards for Hazardous Air Pollutants (40 CFR Parts 61 and 63). Additionally, if the reviewing authority finds during the course of a BACT analysis that there is no economically reasonable or technologically feasible way to accurately measure the emissions, and hence to impose an enforceable emissions standard, it may require the source to use design, alternative equipment, work practices or operational standards to reduce emissions of the pollutant.

BACT analyses are conducted according to a top-down process, where all available control technologies are ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent or "top" alternative. This alternative is to be selected as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not "achievable" in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on.

Under the "top-down" approach, as described in USEPA's *Draft New Source Review Workshop Manual*, the five basic steps of a "top-down" BACT analysis are as follows:

- **Step 1:** Identify potential control technologies;
- **Step 2:** Eliminate technically infeasible options;
- **Step 3**: Rank remaining control technologies by control effectiveness;
- **Step 4:** Evaluate most effective controls based on economic, energy, and environmental impacts; and
- **Step 5:** Select BACT.

The first step is to identify potentially "available" control options for each emission unit triggering PSD, for each pollutant under review. Available options consist of a comprehensive list of those technologies with a potentially practical application to the emission unit in question. The list includes technologies used to satisfy BACT requirements, innovative technologies, and controls applied to similar source categories.

During this BACT review, a combination of the following sources was investigated to identify potentially available control technologies:

- USEPA's RACT/BACT/LAER Clearinghouse (RBLC) database;
- USEPA's New Source Review website;
- USEPA's GHG Mitigation Strategies Database (GMSD);
- In-house experts;
- State air regulatory agency contacts;
- Technical articles and publications;
- State permits issued for similar sources that have not yet been entered into the RBLC; and
- Guidance documents and personal communications with federal and state agencies.

After identifying potential technologies, the second step is to eliminate technically infeasible options from further consideration. To be considered feasible for BACT, a technology must be both "available" and "applicable." The third step is to rank the technologies not eliminated in Step 2 in order of descending control effectiveness for each pollutant of concern. If the highest ranked technology is proposed as BACT, it is not necessary to perform any further technical or economic evaluation. Potential adverse impacts of implementing such technology; however, must still be identified and evaluated.

The fourth step entails an evaluation of energy, environmental, and economic impacts for determining a final level of control. The evaluation begins with the most stringent control option and continues until a technology under consideration cannot be eliminated based on adverse energy, environmental, or economic impacts.

The fifth and final step is to select as BACT the emission limit resulting from application of the most effective of the remaining technologies under consideration for each pollutant of concern.

5.2 Fugitive Components

The five step top-down BACT analysis for GHG emissions from fugitive components associated with the Ethane Chilling Expansion Project is described in the sections below.

5.2.1 *GHG BACT Step 1: Identification of GHG Control Options – Fugitive Emission Components*

The fugitive GHG emission components associated with the Ethane Chilling Expansion Project include conservatively estimated components counts including flanges, valves, compressor seals, and relief

valves based on preliminary engineering design. This component count includes all interconnecting piping modifications. Note that the fugitive GHG emissions will not vary during normal operation and startup/shutdown scenarios.

The fugitive GHG emissions associated with the Ethane Chilling Expansion Project represent approximately 2.5% of the GHG emissions for the Ethane Chilling Expansion Project and less than 0.2% of the GHG emissions for the Aggregated Project. For completeness, SPMT has provided this BACT analysis for fugitive GHG emission components in the sections that follow.

5.2.1.1 Installation of Leak-less Technology Components

Leak-less technology includes leak-less valves and seal-less pumps and compressors. Common leak-less valves include bellows valves and diaphragm valves; and common seal-less pumps are diaphragm pumps, canned motor pumps, and magnetic drive pumps. Leaks from pumps can also be reduced by using dual seals with or without barrier fluid. In addition, welded connections in lieu of flanged or screwed connections may provide for leak-less operation. Leak-less technologies should be nearly 100% effective in eliminating leaks.

5.2.1.2 Implementation of Leak Detection and Repair

Leak Detection and Repair (LDAR) programs based on USEPA Method 21 instrument monitoring for leak detection and repair provisions are viable for streams containing combustible gases, including methane. LDAR programs that are based on a quarterly USEPA Method 21 monitoring of components with a leak definition of 500 parts per million by volume (ppmv) are considered to have a control efficiency of 97% for the majority of components.

5.2.1.3 Implementation of Enhanced LDAR

An Enhanced LDAR program typically requires equipment upgrades including valve replacement and improvement with low-leak valve and packing technologies. Additionally, it requires certain connectors to be replaced with an “improved” type of connector (i.e., gasket replacement or improvement for a flange connection) or replaced with like-kind connectors that are less likely to leak than the existing connector, where process and safety conditions allow. Control efficiencies associated with this technology have been evaluated by the Texas Commission on Environmental Quality (TCEQ) in the APDG 6422 guidance document last revised in June 2018. The highest level of control guidelines, 28LAER, extends a control efficiency of 97% to additional component types.

5.2.1.4 Implementation of Audio/Visual/Olfactory Leak Detection Methods

The effectiveness of Audio/Visual/Olfactory (AVO) Leak Detection methods, which are generally employed for inorganic odorous compounds, are dependent on the system pressure, the odor of the process materials, and the frequency of the AVO inspections. Weekly AVO inspection programs for components in VOC service are assumed to have 30% control efficiency.

5.2.1.5 Use of Remote Sensing

Remote sensing of leaks has been proven as a technology using infrared camera, which has been approved by the USEPA as an alternative to the typical LDAR USEPA Method 21 monitoring under certain instances. Based on the equivalency to USEPA Method 21 monitoring, remote sensing technology is assumed to have no less than 75% control efficiency.

5.2.1.6 Carbon Capture and Sequestration

The only add-on control technology specifically designed for controlling GHG emissions that is currently commercially available is carbon capture and sequestration (CCS), which can reduce GHG emissions by approximately 90%. The USEPA indicates that CCS should be a listed technology in Step 1 of the top down BACT analysis for GHGs. This technology; however, presents some technical and economic challenges described in **Section 5.2.2.2** below.

5.2.2 *GHG BACT Step 2: Eliminate Technically Infeasible Options – Fugitive Emission Components*

Technically infeasible options are discussed below.

5.2.2.1 Leak-less Technology Components

For safety reasons, the installation of leak-less technology components for components associated with the project is not technically feasible. There are a number of flanges or connections that cannot be welded to be able to isolate process equipment including pumps and vessels.

5.2.2.2 Carbon Capture and Sequestration

USEPA guidance identified that CCS should be researched for power plants and other industrial facilities with high-purity CO_2 streams. However, the only new or modified GHG sources proposed as part of the Ethane Chilling Expansion Project are fugitive sources. As defined in 40 CFR §70.2, fugitive sources are "those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening". Since by definition, fugitive sources cannot be reasonably collected for capture and sequestration, SPMT has eliminated CCS as technically infeasible.

5.2.3 *GHG BACT Step 3: Rank Remaining Control Technologies by Control Effectiveness - Fugitive Emission Components*

Technologies for minimizing fugitive GHG emissions from the piping components (estimated level of GHG reduction):

- Implementation of Enhanced LDAR (97%);
- Implementation of LDAR (97%);
- Remote Sensing (75%); and
- Implementation of AVO Leak Detection Methods (30%).

5.2.4 *GHG BACT Step 4: Evaluate Most Effective Controls Based On Economic, Energy, and Environmental Impacts - Fugitive Emission Components*

5.2.4.1 Implementation of Enhanced LDAR

The implementation of Enhanced LDAR is typically found in consent decrees issued by federal entities for facilities that are not in compliance with current LDAR regulations and requirements. SPMT will evaluate equipment upgrades including low-leak valve and packing technologies and the economics of using these components on a case-by-case basis. However, Enhanced LDAR has not been demonstrated as BACT for GHG control from fugitive GHG emission components. Therefore, Enhanced LDAR for GHG BACT will not be considered further for fugitive GHG emission components.

5.2.4.2 Implementation of LDAR

Traditionally, LDAR programs using instrumented detection of leaks have been developed and implemented for control of VOC fugitive emissions. BACT determinations related to fugitive component leaks in VOC service have been identified as an instrumented LDAR program. Although methane is not considered a VOC, it can be detected and quantified by using the same methods in USEPA Method 21. LDAR programs are widely implemented throughout the country for refineries and other manufacturing sites, including the SPMT MHIC. However, LDAR has not been demonstrated as BACT for GHG control from fugitive GHG emission components. Therefore, LDAR for GHG BACT will not be considered further for fugitive GHG emission components.

5.2.4.3 Remote Sensing

Remote sensing of fugitive components in methane service can provide an effective means to identify fugitive leaks; however, remote sensing does not quantify GHG emissions from equipment leaks as USEPA Method 21 does. Moreover, remote sensing has not been demonstrated as BACT for GHG control from fugitive GHG emission components. Therefore, remote sensing for GHG BACT will not be considered further for fugitive GHG emission components.

5.2.4.4 Implementation of AVO Leak Detection Methods

Leaking components in methane service can be identified through AVO methods. Some fugitive components in natural gas or fuel gas service will contain methane.

5.2.5 GHG BACT Step 5: Select BACT - Fugitive Emission Components

SPMT proposes to define that equipment in methane service as a piece of equipment that contains a process fluid (gas or liquid) that is at least 10% by weight of methane, which is consistent with the definition of in VOC service as defined in 40 CFR §60.481a.

A review of the RBLC listings since regulation of GHG as a criteria pollutant was implemented, as well as USEPA and state permit databases indicates there are no facilities in operation employing LDAR or enhanced LDAR to reduce GHG emissions to achieve BACT for components not also in VOC service. A table summarizing the relevant results of the review have been summarized in **Table 5-1**.

Table 5-1: BACT Permit Review Results

Project	Permit State - NSR ID	BACT Determination	In Operation?
Gulf Coast Growth Ventures	TX - 146245	LDAR program compliant with Texas' 28VHP program outline for components in VOC service. No indication of a specific program for reduction of emissions from methane components.	Yes
Enterprise – Mont Belvieu	TX - 0890	AVO monitoring of components containing ≥10% methane. LDAR program compliant with Texas' 28VHP program outline for components in VOC service.	Project not completed
Formosa Plastics – Point Comfort	TX - 127838	LDAR program compliant with Texas' 28VHP program outline for components in VOC service and containing ≥10% methane.	No - Not constructed

Project	Permit State - NSR ID	BACT Determination	In Operation?
DCP Midstream - Lucerne Gas Processing Plant	CO - 0068	LDAR program compliant with 40 CFR 60, Subpart OOOO.	GHG Permit Rescinded
Motiva - Port Arthur Refinery	TX - 0759	LDAR program compliant with Texas' 28VHP program outline for components in VOC service. No indication of a specific program for reduction of emissions from methane components.	Project not completed

SPMT proposes to meet GHG BACT requirements for the new fugitive GHG emission components associated with SPMT Ethane Chilling Project through implementation of AVO leak detection methods for fugitive components in methane service.

For GHG components which are also in VOC service, LAER level controls will be implemented as outlined in **Section 6** below.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO David S. Smith, E.I.T. DSS 4/18/24
Air Quality Engineering Specialist
Facilities Permitting Section
Air Quality Program
Southeast Regional Office

FROM Daniel J. Roble DJR
Air Quality Program Specialist
Air Quality Modeling and Risk Assessment Section
Division of Permits
Bureau of Air Quality

THROUGH Andrew W. Fleck AWF
Environmental Group Manager
Air Quality Modeling and Risk Assessment Section
Division of Permits
Bureau of Air Quality

DATE April 18, 2024

RE Air Quality Analyses for Prevention of Significant Deterioration
Energy Transfer Marketing & Terminals, L.P.
Plan Approval 23-0119K
Proposed Ethane Chilling Expansion Project
Marcus Hook Terminal, Marcus Hook Borough, Delaware County

The Pennsylvania Department of Environmental Protection's (DEP) Air Quality Modeling Section has completed its technical review of the air quality analyses included in Energy Transfer Marketing & Terminals, L.P.'s (ETMT) plan approval application for its proposed Ethane Chilling Expansion Project at Marcus Hook Terminal (MHT) in Marcus Hook Borough, Delaware County.

ETMT's proposed Ethane Chilling Expansion Project and previous natural gas liquids (NGL) projects were aggregated as a single project for Prevention of Significant Deterioration (PSD) applicability purposes. ETMT's single aggregated project at MHT is a major modification to an existing major stationary source and therefore subject to the PSD regulations.

The DEP's technical review concludes that ETMT's air quality analyses satisfy the requirements of the PSD regulations. The DEP's summary of ETMT's air quality analyses for PSD is attached.

If you have any questions regarding ETMT's air quality analyses for PSD, you may contact me (droble@pa.gov, 717.705.7689) or Andrew Fleck (afleck@pa.gov, 717.783.9243).

Attachment

cc: James Rebarchak, SERO Air Quality
Janine Tulloch-Reid, SERO Facilities Permitting
Viren Trivedi, BAQ Permits
Sean Wenrich, BAQ New Source Review
AQ Modeling Correspondence File

DEP Summary of Air Quality Analyses for Prevention of Significant Deterioration
Energy Transfer Marketing & Terminals, L.P.
Plan Approval 23-0119K
Proposed Ethane Chilling Expansion Project
Marcus Hook Terminal, Marcus Hook Borough, Delaware County
April 18, 2024

I. Background

The Pennsylvania Department of Environmental Protection (DEP) received a plan approval application on February 14, 2022, from Sunoco Partners Marketing & Terminals, L.P. (SPMT) for its proposal to add process equipment to increase the ethane chilling capacity, referred to as the Ethane Chilling Expansion Project, at Marcus Hook Industrial Complex in Marcus Hook Borough, Delaware County.[1] The plan approval application was prepared by Environmental Resources Management (ERM), on behalf of SPMT. Effective March 1, 2022, SPMT changed its company name to Energy Transfer Marketing & Terminals, L.P. (ETMT) and the facility name to Marcus Hook Terminal (MHT). On March 15, 2022, the DEP's Southeast Regional Office (SERO) notified ETMT that its plan approval application was administratively complete.[2]

Subsequently, the DEP received additional information associated with ETMT's plan approval application during its technical review.[3,4,5]

II. PSD Requirements

In accordance with the adjudication decision by the Commonwealth of Pennsylvania Environmental Hearing Board (EHB),[6] ETMT's proposed Ethane Chilling Expansion Project and previous natural gas liquids (NGL) projects should be aggregated as a single project for Prevention of Significant Deterioration (PSD) applicability purposes.

ETMT's single aggregated project at MHT is a major modification[7] to an existing major stationary source[8] and therefore subject to the PSD regulations codified in 40 CFR § 52.21. These federal PSD regulations are adopted and incorporated by reference in their entirety in 25 *Pa. Code* § 127.83 and the Commonwealth's State Implementation Plan (SIP) codified in 40 CFR § 52.2020.

[1] Letter with enclosures from Lisa M. Garcia, SPMT to David Smith, DEP/SERO/Air Quality/Facilities Permitting. February 14, 2022.
[2] Letter from David S. Smith, DEP/SERO/Air Quality/Facilities Permitting to Edward G. Human, ETMT. March 15, 2022.
[3] E-mail with attachment from Tom Wickstrom, ERM to Andrew Fleck, DEP/BAQ/Air Quality Modeling. February 27, 2023.
[4] E-mail with attachment from Adam DiAntonio, ERM to James Rebarchak, DEP/SERO/Air Quality and Janine Tulloch-Reid, DEP/SERO/Air Quality/Facilities Permitting. March 31, 2023.
[5] E-mail with attachment from Adam DiAntonio, ERM to David S. Smith, DEP/SERO/Air Quality/Facilities Permitting. April 3, 2023.
[6] Clean Air Council v. Commonwealth of Pennsylvania Department of Environmental Protection and Sunoco Partners Marketing & Terminals, L.P., Permittee. EHB Docket No. 2016-073-L.
[7] *Code of Federal Regulations*. 40 CFR § 52.21(b)(2). Definition of "major modification."
[8] *Code of Federal Regulations*. 40 CFR § 52.21(b)(1). Definition of "major stationary source."

ETMT calculated the net emissions increase[9] of carbon monoxide (CO), nitrogen oxides (NO_X), sulfur dioxide (SO_2), particulate matter (PM), particulate matter less than or equal to 10 micrometers in diameter (PM-10), particulate matter less than or equal to 2.5 micrometers in diameter (PM-2.5), lead (Pb), and sulfuric acid mist (H_2SO_4) for the single aggregated project. ETMT's net emissions increase equals or exceeds the PSD significant emission rates (SER)[10] for CO, NO_X, and PM-2.5, therefore requiring ETMT to conduct air quality analyses for these pollutants. ETMT's net emissions increase for the single aggregated project for pollutants potentially requiring an air quality analysis is summarized in Table 1.

Table 1: ETMT's Net Emissions Increase for Single Aggregated Project

Pollutant	Single Aggregated Project Net Emissions Increase[A]	PSD Significant Emission Rate
	tpy	tpy
CO	103.90	100
NO_X	63.16	40
SO_2	17.94	40
PM	4.039	25
PM-10	3.829	15
PM-2.5	1.983	10 of direct PM-2.5, 40 of SO_2, or 40 of NO_X
Pb	0.00801	0.6
H_2SO_4	0.0642	7

[A] Values were corrected according to DEP/SERO technical review.

Relevant to 40 CFR § 52.21(k) through (p) of the PSD regulations, ETMT's plan approval application included the following air quality analyses:

- Source impact analyses of the net emissions increase of CO, NO_X, and PM-2.5 due to ETMT's major modification of MHT;
- Additional impact analyses of the impairment to visibility, soils, and vegetation due to ETMT's major modification of MHT and associated growth; and
- Initial screening calculations to determine whether the net emissions increase due to ETMT's major modification of MHT would have negligible impacts on air quality related values (AQRV) and visibility in nearby federal Class I areas.

[9] *Code of Federal Regulations*. 40 CFR § 52.21(b)(3). Definition of "net emissions increase."
[10] *Code of Federal Regulations*. 40 CFR § 52.21(b)(23). Definition of "significant."

III. Air Dispersion Modeling

A. Model Selection

ETMT's air dispersion modeling utilized the American Meteorological Society (AMS) / U.S. Environmental Protection Agency's (EPA) Regulatory Model (AERMOD) v22112. AERMOD is the EPA's required near-field air dispersion model for a wide range of regulatory applications in all types of terrain and for aerodynamic building downwash.[11]

B. Model Input

1. Control Pathway

AERMOD was executed with regulatory default options to calculate concentrations for each applicable pollutant and averaging time.

AERMOD was executed with rural dispersion, by default, based on the EPA's recommended Land Use Procedure.[12,13] The EPA's Land Use Procedure was conducted by evaluating National Land Cover Database (NLCD) v2019 land cover data for 2019 from the U.S. Geological Survey (USGS) Multi-Resolution Land Characteristics Consortium (MRLC). NLCD land cover code 23 (Developed, Medium Intensity) and land cover code 24 (Developed, High Intensity) were considered to be equivalent to Auer[14] land use types that are classified as urban by the EPA's Land Use Procedure, whereas the remaining NLCD land cover codes were considered to be equivalent to Auer land use types that are classified as rural. There is not sufficient urban land cover, which contributes to an urban heat island effect, to support the use of AERMOD's urban dispersion option. ETMT provided justification for rural dispersion in subsection 3.3.1 (Land Use Characteristics) of the Air Quality Modeling Report (Appendix F of the plan approval application) and in subsection 4.3 (Supplement to Section 3.3.1 – Land Use Characteristics) of the plan approval application addendum.[15]

In the 1-hour and annual nitrogen dioxide (NO_2) analyses, the EPA's 2nd-tier screening technique was used to account for NO_2 chemistry by selecting the Ambient Ratio Method 2 (ARM2) regulatory option in AERMOD with default upper and lower limits on the ambient NO_2/NO_X ratio applied to the modeled NO_X concentration of 0.9 and 0.5, respectively.[16]

[11] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W (Guideline on Air Quality Models). Subsection 4.2.2.1(a).
[12] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W (Guideline on Air Quality Models). Subsection 7.2.1.1(b)(i).
[13] AERMOD Implementation Guide (EPA-454/B-22-008, June 2022). Subsection 5.1.
[14] Auer, Jr., A.H., 1978. Correlation of Land Use and Cover with Meteorological Anomalies. *Journal of Applied Meteorology*, 17(5): 636–643.
[15] E-mail with attachment from Adam DiAntonio, ERM to James Rebarchak, DEP/SERO/Air Quality and Janine Tulloch-Reid, DEP/SERO/Air Quality/Facilities Permitting. March 31, 2023.
[16] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W (Guideline on Air Quality Models). Subsection 4.2.3.4(d).

2. Source Pathway

a. Source Characterization

ETMT's aggregated project emissions of CO, NO_X, and PM-2.5 are and would be released to the atmosphere via typical unobstructed vertical stacks that were characterized in AERMOD as point sources. ETMT's emission sources, associated model source IDs, and pollutants are listed in Table 2.

Table 2: ETMT's Emission Sources, Model Source IDs, and Pollutants

Emission Source(s)	Model Source ID(s)	Pollutant(s)
3 Auxiliary Boilers	B031	CO, NO_X, PM-2.5
1 West Warm Flare	WWF	CO, NO_X
1 ME-1 Cold Flare (Low & high pressure)	ME1CF_LP, ME1CF_HP	CO, NO_X
1 ME-2 Cold Flare (Low pressure)	ME2CF_LP	CO, NO_X
1 ME-2x Cold Flare (Low & high pressure)	ME2XCFLP, ME2XCFHP	CO, NO_X
1 Mechanical Draft 15-2B Cooling Tower (6 cells)	152BCTC1 – 152BCTC6	PM-2.5
2 Mechanical Draft Cooling Towers (3 cells each)	230119C1 – 230119C3 & 230119D1 – 230119D3	PM-2.5
2 Wet Surface Air Coolers (5 cells each)	1WSAC1 – 1WSAC5 & 2WSAC1 – 2WSAC5	PM-2.5

b. Emission Data

The emission rates and associated parameters entered in AERMOD for each source are consistent with those that ETMT provided in Attachment C (Model Source Information) of the Air Quality Modeling Report (Appendix F of the plan approval application). Emission data were entered in AERMOD for the auxiliary boilers that account for 9 combinations of the number of auxiliary boilers operating at the same time (one, two, and three) and the operating level (100, 75, and 50 percent). Emission rates entered in AERMOD that represent ETMT's net emissions increase of CO and NO_X and net emissions increase of PM-2.5 are summarized in Table 3a and Table 3b, respectively.

Table 3a: ETMT's Modeled Emission Rates of CO and NO_X

Model Source ID	CO Modeled Emission Rate		NO_X Modeled Emission Rate	
	1-hour	8-hour	1-hour	Annual
	lb/hr	lb/hr	lb/hr	lb/hr
B031[A]	22.69	22.69	18.91	18.91
WWF	4.33	4.33	0.95	0.95
ME1CF_LP	1.48	1.48	0.33	0.33
ME1CF_HP	6.10	6.10	1.34	1.34
ME2CF_LP	3.58	3.58	0.78	0.78
ME2XCFLP	3.69	3.69	0.81	0.81
ME2XCFHP	2.52	2.52	0.55	0.55

[A] Total emission rate for 3 auxiliary boilers at 100% operating level.

Table 3b: ETMT's Modeled Emission Rates of PM-2.5

Model Source ID(s)	PM-2.5 Modeled Emission Rate	
	24-hour	Annual
	lb/hr	lb/hr
B031[A]	3.93	1.67
152BCTC1 – 152BCTC6[B]	1.31E-02	1.31E-02
230119C1 – 230119C3[B]	8.37E-04	8.37E-04
230119D1 – 230119D3[B]	4.57E-03	4.57E-03
1WSAC1 – 1WSAC5 & 2WSAC1 – 2WSAC5[B]	3.07E-05	3.07E-05

[A] Total emission rate for 3 auxiliary boilers at 100% operating level.
[B] Emission rate for each cell.

c. Good Engineering Practice Stack Height and Downwash

ETMT's buildings and structures affecting downwash and stacks at MHT were entered in the EPA's Building Profile Input Program for Plume Rise Model Enhancements (BPIPPRM) v04274. The height of each stack was fully creditable for entry in AERMOD since none exceeded Good Engineering Practice (GEP) stack height,[17] i.e., the greater of 65 meters or the GEP formula stack height calculated by BPIPPRM. ETMT's GEP stack heights and stack heights entered in AERMOD are summarized in Table 4.

[17] *Code of Federal Regulations*. 40 CFR § 51.100(ii). Definition of "good engineering practice stack height."

Table 4: ETMT's GEP Stack Heights and Modeled Stack Heights

Model Source ID(s)	GEP Formula Stack Height(s)	GEP Stack Height(s)	Modeled Stack Height(s)
	m	m	m
B031	84.19	84.19	83.76
WWF[A]	-----	-----	61.32[B]
ME1CF_LP[A]	-----	-----	39.03[B]
ME1CF_HP[A]	-----	-----	39.71[B]
ME2CF_LP[A]	-----	-----	79.13[B]
ME2XCFLP[A]	-----	-----	61.54[B]
ME2XCFHP[A]	-----	-----	61.19[B]
152BCTC1	35.87	65.00	17.43
152BCTC2 – 152BCTC6	35.82 – 35.90 (varies by cell)	65.00 (each cell)	18.59 (each cell)
230119C1	133.04	133.04	13.69
230119C2	133.98	133.98	13.66
230119C3	134.14	134.14	13.72
230119D1	134.11	134.11	13.99
230119D2	133.54	133.54	13.96
230119D3	131.90	131.90	13.93
1WSAC1 – 1WSAC5	113.71 – 114.31 (varies by cell)	113.71 – 114.31 (varies by cell)	8.69 (each cell)
2WSAC1 – 2WSAC5	132.91 – 133.02 (varies by cell)	132.91 – 133.02 (varies by cell)	8.69 (each cell)

[A] Flares are excluded from the GEP stack height regulation.
[B] Modeled stack height for each flare is the effective stack height based on "AERSCREEN User's Guide" (EPA-454/B-21-005, April 2021), subsection 2.1.2.

Additionally, direction-specific downwash parameters, calculated by BPIPPRM, were entered in AERMOD for each stack.

d. PM-2.5 PSD Increment Affecting Sources

ETMT's plan approval application is the first administratively complete application for a proposed project in Delaware County that is subject to the PSD regulations with significant emissions of direct PM-2.5 or PM-2.5 precursors, i.e., NO_X and/or SO_2, after the PM-2.5 trigger date of October 20, 2011.[18] ETMT's plan approval application therefore establishes the PM-2.5 minor source baseline date[19] as March 9, 2022,[20] for the PM-2.5 baseline area[21] that includes all of Delaware County.

[18] *Code of Federal Regulations*. 40 CFR § 52.21(b)(14)(ii)(c). Definition of "trigger date."
[19] *Code of Federal Regulations*. 40 CFR § 52.21(b)(14)(ii). Definition of "minor source baseline date."
[20] Letter from David S. Smith, DEP/SERO/Air Quality/Facilities Permitting to Edward G. Human, ETMT. March 15, 2022.
[21] *Code of Federal Regulations*. 40 CFR § 52.21(b)(15)(i). Definition of "baseline area."

Actual emissions[22] of direct PM-2.5 and PM-2.5 precursors associated with ETMT's previous NGL projects at MHT were aggregated with the proposed Ethane Chilling Expansion Project and included in ETMT's 24-hour PM-2.5 and annual PM-2.5 Class II PSD increment analyses. No actual emissions were identified from any other major stationary source on which construction commenced after the major source baseline date[23] of October 20, 2010, that would affect PM-2.5 Class II PSD increment in the area impacted by ETMT's net emissions increase of PM-2.5 and PM-2.5 precursors.

3. Receptor Pathway

a. Receptors

Receptors were entered in AERMOD at locations defined to be ambient air.[24,25]

In the Class II significant impact level (SIL) analyses and Class II PSD increment analyses, a 50-by 50-kilometer Cartesian receptor grid, with receptor density decreasing with distance, was centered on MHT. ETMT provided a detailed description of AERMOD's receptor domain in subsection 3.4 (Receptor Grids) of the Air Quality Modeling Report (Appendix F of the plan approval application).

In the Class I SIL analyses, ETMT entered receptors in AERMOD within the nearby federal Class I areas, i.e., Brigantine National Wildlife Refuge in New Jersey, Shenandoah National Park in Virginia, and Dolly Sods Wilderness and Otter Creek Wilderness, both in West Virginia, as provided by the Federal Land Managers (FLM).[26] The DEP conducted additional model runs utilizing a full ring of receptors entered in AERMOD at an approximate distance of 50 kilometers from MHT with a receptor separation of 1 degree.

The extent and density of ETMT's receptor domain in AERMOD were adequate to determine the location and magnitude of the maximum concentrations in the Class II and Class I SIL analyses and the design concentrations in the Class II PSD increment analyses.

b. Terrain Preprocessing

In the Class II SIL analyses, receptor elevations and hill height scales were calculated by the AERMOD terrain preprocessor (AERMAP) v18081 using elevation data from the USGS 3-Dimensional Elevation Program (3DEP) with a resolution of one-third arc-second.

In the Class I SIL analyses, ETMT utilized receptor elevations provided by the FLMs for Class I areas. Hill height scales were calculated by AERMAP using these receptor elevations along with elevation data from the USGS 3DEP with a resolution of one-third arc-second. For its additional

[22] *Code of Federal Regulations*. 40 CFR § 52.21(b)(21). Definition of "actual emissions."
[23] *Code of Federal Regulations*. 40 CFR § 52.21(b)(14)(i)(c). Definition of "major source baseline date."
[24] *Code of Federal Regulations*. 40 CFR § 50.1(e). Definition of "ambient air."
[25] Revised Policy on Exclusions from "Ambient Air." EPA memorandum from Andrew R. Wheeler, Administrator to Regional Administrators. December 2, 2019.
[26] National Park Service (NPS) DataStore. https://irma.nps.gov/DataStore/Reference/Profile/2249830.

model runs, the DEP utilized receptor elevations and hill height scales were calculated by AERMAP v18081 using elevation data from the USGS 3DEP with a resolution of one-third arc-second.

4. Meteorological Pathway

ETMT's air dispersion modeling utilized a 5-year meteorological dataset consisting of hourly records from January 1, 2016, through December 31, 2020, derived from surface data measured at Philadelphia International Airport (KPHL) and upper air data measured at Washington Dulles International Airport (KIAD).

a. Meteorological Dataset Preprocessing

The meteorological dataset was processed by the DEP with the AERMOD meteorological preprocessor (AERMET) v22112 and its associated AERMINUTE v15272 preprocessor and AERSURFACE v20060 tool.

The KPHL and KIAD data provide the minimum meteorological measurements necessary for AERMET to produce the two output files, i.e., the surface and profile files, necessary for AERMOD input. The KPHL surface data included single-level measurements of wind direction and wind speed at 7.92 meters, as well as measurements of station pressure, cloud cover, dry bulb temperature, dew point temperature, and relative humidity. The KIAD upper air data included multi-level morning measurements of atmospheric pressure, dry bulb temperature, dew point temperature, wind direction, and wind speed from the surface to the first level above 5,000 meters.

AERMET Stage 1 extracted KPHL surface data, downloaded from the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) in the Integrated Surface Data (ISD) format, and KIAD upper air data, downloaded from NOAA's Earth System Research Laboratory (ESRL) Radiosonde Database in the Forecast Systems Laboratory (FSL) format. Before processing with AERMET Stage 1, a Line 9 with missing data codes was added to the KIAD upper air 12Z measurements with a missing Line 9. This allowed AERMET to process the available upper air 12Z measurements. Additionally, AERMET Stage 1 utilized the MODIFY option to check for problems with the upper air data and correct them.

AERMET Stage 2 utilized output data from AERMINUTE, which processed KPHL 1-minute and 5-minute wind speed and wind direction measurements downloaded from NCEI.

AERMET Stage 2 utilized the surface friction velocity adjustment option, which is intended to address potential concerns regarding AERMOD's performance relevant to the overprediction of concentrations during stable low wind speed meteorological conditions by adjusting the surface friction velocity based on Qian, W., and A. Venkatram, 2011.[27]

[27] Qian, W., and A. Venkatram, 2011. Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions. *Boundary Layer Meteorology*, 138, 475-491.

AERMET Stage 2 utilized options for substitutions of missing temperature and cloud cover measurements, an anemometer height of 7.92 meters, a minimum wind speed threshold of 0.5 meter per second, and a 3-hour before to 1-hour after 12Z window for determining upper air measurements for use.

AERMET Stage 2 utilized output data from AERSURFACE, which processed NLCD v2019 land cover, impervious surface, and tree canopy data for 2016, downloaded from the USGS MRLC, to estimate noontime albedo, daytime Bowen ratio, and surface roughness length for the KPHL meteorological site. AERSURFACE utilized options for a default 1-kilometer surface roughness length study area with seven user-defined sectors with airport designations, non-arid condition, and monthly frequency with default month-to-season assignments. Surface moisture condition (wet, dry, or average) for the KPHL meteorological site was based on average precipitation data for Pennsylvania Climate Division 03, downloaded from NCEI, and derived in accordance with the EPA's guidance[28] to determine the surface moisture condition thresholds using a 30-year (1991-2020) climatological dataset. Snow cover condition (non-continuous or continuous) was based on Local Climatological Data, downloaded from NCEI, for the KPHL meteorological site.

b. Meteorological Dataset Representativeness

The fully processed meteorological dataset satisfies the EPA's recommendations for use in AERMOD,[29] and was appropriate for AERMOD to construct realistic boundary layer profiles to adequately represent plume transport and dispersion under both convective and stable conditions within the modeling domain. Additionally, the fully processed meteorological dataset satisfies the DEP's data completeness recommendation for use in air dispersion modeling.

The KPHL meteorological site, located approximately 17.4 kilometers northeast of MHT, is the nearest site with Automated Surface Observing System (ASOS) instrumentation, which provided 1-minute and 5-minute wind measurements that, when processed, increased the hourly meteorological data records available to AERMOD for calculating concentrations by keeping reported calm and variable winds to a minimum. The KPHL meteorological site is on a wide open, flat plain with no major obstacles to the meteorological instrumentation. The KPHL meteorological tower base elevation is approximately 2 meters. ETMT's emission sources at MHT have similar base elevations that range from 2.85 to 7.16 meters. There is no significant terrain between the KPHL meteorological site and MHT.

The KIAD meteorological site, located approximately 198 kilometers southwest of MHT, is the nearest upper air data site. There is no significant terrain between the KIAD meteorological site and MHT.

As recommended by the EPA's guidance,[30] the estimated values of the surface characteristics, i.e., noontime albedo, daytime Bowen ratio, and surface roughness length, for the KPHL

[28] User's Guide for AERSURFACE Tool (EPA-454/B-20-008, February 2020). Subsection 2.3.3.
[29] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W (Guideline on Air Quality Models). Subsections 8.4.3.2 and A.1(b)(2).
[30] AERMOD Implementation Guide (EPA-454/B-22-008, June 2022). Subsection 3.1.1.

meteorological site were compared to those of MHT. The sites have similar estimated values; nonetheless, ETMT conducted an additional set of modeling runs utilizing the meteorological dataset processed with the MHT surface characteristics.

ETMT provided justification for the use of the meteorological dataset in subsection 3.5 (Meteorological Data for Air Quality Modeling) of the Air Quality Modeling Report (Appendix F of the plan approval application).

C. Secondary PM-2.5 Formation

In the 24-hour PM-2.5 and annual PM-2.5 analyses, the AERMOD results were appropriately adjusted upward to account for secondary PM-2.5 formation due to ETMT's net emissions increase of both PM-2.5 precursors, i.e., NO_X and SO_2, based on the EPA's guidance.[31,32] ETMT's estimated secondary PM-2.5 impacts in Class II areas were conservatively based on the EPA's photochemical grid modeling results for the Chester, PA hypothetical source with a 10-meter stack and 500 tons per year of emissions of each precursor. ETMT's estimated secondary PM-2.5 impacts in Class I areas were conservatively assumed to be the same as the estimated secondary PM-2.5 impacts in Class II areas, i.e., the estimated secondary impacts did not account for the distances to the Class I areas. ETMT provided calculations for the estimated secondary PM-2.5 impacts in subsection 3.2.2 (Secondary $PM_{2.5}$ Impacts – Tier 1 Assessment) of the Air Quality Modeling Report (Appendix F of the plan approval application). ETMT's estimated secondary PM-2.5 impacts are summarized in Table 5.

Table 5: ETMT's Estimated Secondary PM-2.5 Impacts in Class II and Class I Areas[A]

Averaging Time	Secondary PM-2.5 Impact Due to NO_X	Secondary PM-2.5 Impact Due to SO_2	Total Secondary PM-2.5 Impact
	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
24-hour	0.01081	0.00952	0.02033
Annual	0.00087	0.00024	0.00111

[A] ETMT's calculations were corrected by the DEP consistent with the DEP's corrected net emissions increase for the single aggregated project listed in Table 1.

D. Existing Ambient Air Quality

Existing ambient air quality was established for the area that ETMT's net emissions increase due to the major modification of MHT would affect by utilizing representative CO, NO_2, and PM-2.5 data measured from January 1, 2019, through December 31, 2021, at the ambient monitors listed in Table 6.

[31] Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program (EPA-454/R-19-003, April 2019).

[32] Guidance for Ozone and Fine Particulate Matter Permit Modeling (EPA-454/R-22-005, July 2022).

Table 6: Monitors for Establishing Existing Ambient Air Quality

Pollutant	Monitor Site Name	Monitor Operator	Monitor Site ID	Distance/Direction from MHT
CO	MLK	Delaware DNREC	10-003-2004	13 km / SW
NO_2	Chester	DEP	42-045-0002	5 km / ENE
PM-2.5	Marcus Hook	DEP	42-045-0109	0.6 km / E

Since the impact of ETMT's net emissions increase due to the major modification of MHT was calculated by AERMOD, as described later, to be less than each pollutant's SILs for the National Ambient Air Quality Standards (NAAQS), the ambient monitoring data were used to support the conclusion that the impact of the net emissions increase of each pollutant would not cause or contribute to a violation of the NAAQS without having to conduct a cumulative impact analysis. As shown in Table 7, the difference between the NAAQS and the 2019-2021 monitored design value is greater than the SIL for the NAAQS for each pollutant and averaging time subject to PSD review.

Table 7: Comparison of NAAQS Minus Monitored Design Values to SILs for NAAQS

Pollutant	Averaging Time	NAAQS	Monitored Design Value 2019-2021[A]		NAAQS Minus Monitored Design Value	SIL for NAAQS
		$\mu g/m^3$	ppm or ppb	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
CO	1-hour	40,000	1.8 ppm	2,059.2	37,940.8	2,000
	8-hour	10,000	1.3 ppm	1,487.2	8,512.8	500
NO_2	1-hour	188	41 ppb	77.08216	110.91784	7.5
	Annual	100	9 ppb	16.92047	83.07953	25
PM-2.5	24-hour	35	-----	22	13	1.2
	Annual	12	-----	8.6	3.4	0.2

[A] Monitored design values for CO in parts per million (ppm) and NO_2 in parts per billion (ppb) were converted to micrograms per cubic meter ($\mu g/m^3$) using AERMOD.

Additionally, ETMT should be exempted from the PSD pre-application ambient monitoring requirements[33] for PM and H_2SO_4 since the EPA has not established a significant monitoring concentration (SMC) for these pollutants.[34]

E. Modeling Results

1. SIL Analyses

a. SIL Analyses for NAAQS and Class II PSD Increments

The impacts of ETMT's net emissions increase due to the major modification of MHT were calculated by AERMOD to be less than the following:

[33] *Code of Federal Regulations*. 40 CFR § 52.21(m).
[34] *Code of Federal Regulations*. 40 CFR § 52.21(i)(5).

- The EPA's 1-hour CO and 8-hour CO SILs for the NAAQS;[35]
- The EPA's 1-hour NO_2 interim SIL for the NAAQS;[36,37]
- The EPA's annual NO_2 SIL for the NAAQS;[38]
- The EPA's 24-hour PM-2.5 and annual PM-2.5 SILs for the NAAQS;[39,40,41]
- The EPA's annual NO_2 SIL for the Class II PSD increment;[42] and
- The EPA's 24-hour PM-2.5 and annual PM-2.5 SILs for the Class II PSD increments.[43]

Cumulative impact analyses were therefore not necessary for the 1-hour CO, 8-hour CO, 1-hour NO_2, annual NO_2, 24-hour PM-2.5, and annual PM-2.5 NAAQS, as well as the annual NO_2 Class II PSD increment.

Cumulative impact analyses were also not necessary for the 24-hour PM-2.5 and annual PM-2.5 Class II PSD increments since ETMT's plan approval application establishes the PM-2.5 minor source baseline date for Delaware County and no actual emissions of direct PM-2.5 or PM-2.5 precursors were identified from any major stationary source on which construction commenced after the major source baseline date, except those associated with ETMT's previous NGL projects, which were aggregated with the proposed Ethane Chilling Expansion Project.

The results of ETMT's SIL analyses for the NAAQS and Class II PSD Increments are summarized for each meteorological dataset utilized with AERMOD in Table 8.

[35] *Code of Federal Regulations*. 40 CFR § 51.165(b)(2).
[36] Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program. EPA memorandum from Stephen D. Page, OAQPS to Regional Air Division Directors. June 29, 2010. Pages 11-13.
[37] Interim 1-Hour Significant Impact Levels for Nitrogen Dioxide and Sulfur Dioxide. DEP memorandum from Andrew W. Fleck, BAQ/Air Quality Modeling to Regional Air Program Managers. December 1, 2010.
[38] *Code of Federal Regulations*. 40 CFR § 51.165(b)(2).
[39] Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. EPA memorandum from Peter Tsirigotis, OAQPS to Regional Air Division Directors. April 17, 2018. Pages 15-16.
[40] Technical Basis for the EPA's Development of the Significant Impact Thresholds for $PM_{2.5}$ and Ozone (EPA-454/R-18-001, April 2018).
[41] Legal Memorandum: Application of Significant Impact Levels in the Air Quality Demonstration for Prevention of Significant Deterioration Permitting under the Clean Air Act. April 2018.
[42] *Code of Federal Regulations*. 40 CFR § 51.165(b)(2). Based on long-standing EPA policy and guidance, these NAAQS SILs have also been applied to Class II PSD increments.
[43] Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. EPA memorandum from Peter Tsirigotis, OAQPS to Regional Air Division Directors. April 17, 2018. Pages 16-17.

Table 8: Results of ETMT's SIL Analyses for NAAQS and Class II PSD Increments

Pollutant	Averaging Time	Modeled Maximum Concentration		SIL for NAAQS & Class II PSD Increment
		Meteorological Dataset Processed with KPHL Surface Characteristics	Meteorological Dataset Processed with MHT Surface Characteristics	
		$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
CO	1-hour	25.69072	30.35097	2,000
	8-hour	9.19624	9.76582	500
NO_2	1-hour	4.31995	4.96737	7.5
	Annual	0.18437	0.16788	1.0
PM-2.5[A]	24-hour	0.16568	0.15532	1.2
	Annual	0.01845	0.01759	0.2
PM-2.5[B]	24-hour	0.23497	0.19491	1.2
	Annual	0.02093	0.01995	0.2

[A] Based on the forms of the SILs for the NAAQS. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.
[B] Based on the forms of the SILs for the PSD increments. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.

b. SIL Analyses for Class I PSD Increments

The impacts of ETMT's net emissions increase due to the major modification of MHT were conservatively calculated by AERMOD to be less than the following:

- The EPA's annual NO_2 proposed SIL for the Class I PSD increment;[44] and
- The EPA's 24-hour PM-2.5 and annual PM-2.5 SILs for the Class I PSD increments.[45,46,47]

Cumulative impact analyses were therefore not necessary for the annual NO_2, 24-hour PM-2.5, and annual PM-2.5 Class I PSD increments.

The results of ETMT's and the DEP's SIL analyses for the Class I PSD increments are summarized for each meteorological dataset utilized with AERMOD in Table 9a and Table 9b, respectively.

[44] *Federal Register*. 61 FR 38249. Prevention of Significant Deterioration and Nonattainment New Source Review; Proposed Rule. July 23, 1996.
[45] Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program. EPA memorandum from Peter Tsirigotis, OAQPS to Regional Air Division Directors. April 17, 2018. Pages 16-17.
[46] Technical Basis for the EPA's Development of the Significant Impact Thresholds for $PM_{2.5}$ and Ozone (EPA-454/R-18-001, April 2018).
[47] Legal Memorandum: Application of Significant Impact Levels in the Air Quality Demonstration for Prevention of Significant Deterioration Permitting under the Clean Air Act. April 2018.

Table 9a: Results of ETMT's SIL Analyses for Class I PSD Increments

Pollutant	Averaging Time	Modeled Maximum Concentration[B]		SIL for Class I PSD Increment
		Meteorological Dataset Processed with KPHL Surface Characteristics	Meteorological Dataset Processed with MHT Surface Characteristics	
		$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
NO_2	Annual	0.00151	0.00069	0.1
PM-2.5[A]	24-hour	0.02098	0.02063	0.27
	Annual	0.00123	0.00117	0.05

[A] Based on the forms of the SILs for the PSD increments. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.
[B] All modeled maximum concentrations occur at receptors in Brigantine Wilderness Area, NJ.

Table 9b: Results of ETMT's SIL Analyses for Class I PSD Increments (DEP Additional Runs)

Pollutant	Averaging Time	Modeled Maximum Concentration		SIL for Class I PSD Increment
		Meteorological Dataset Processed with KPHL Surface Characteristics	Meteorological Dataset Processed with MHT Surface Characteristics	
		$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
NO_2	Annual	0.00592	0.00768	0.1
PM-2.5[A]	24-hour	0.02452	0.02627	0.27
	Annual	0.00159	0.00175	0.05

[A] Based on the forms of the SILs for the PSD increments. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.

2. Comparison of SIL Analyses Results to NAAQS

Cumulative impact analyses for the 1-hour CO, 8-hour CO, 1-hour NO_2, annual NO_2, 24-hour PM-2.5 and annual PM-2.5 NAAQS were not necessary, as stated previously. The DEP therefore provides Table 10 to show that the sum of (1) the impact of ETMT's net emissions increase due to the major modification of MHT, i.e., the result of the SIL analysis for the NAAQS, plus (2) the monitored background concentration, i.e., the 2019-2021 monitored design value, is well below the NAAQS for each pollutant and averaging time.

Table 10: Comparison of Maximum Modeled Concentration Plus Monitored Design Value to NAAQS

Pollutant	Averaging Time	Modeled Maximum Concentration	Monitored Design Value 2019-2021	Total Concentration	NAAQS	Percent of NAAQS
		$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	%
CO	1-hour	25.69072	2,059.2	2,084.89072	40,000	5.21
	8-hour	9.19624	1,487.2	1,496.39624	10,000	14.96
NO_2	1-hour	4.31995	77.08216	81.40211	188	43.30
	Annual	0.18437	16.92047	17.10484	100	17.10
PM-2.5[A]	24-hour	0.16568	22	22.16568	35	63.33
	Annual	0.01845	8.6	8.61845	12.0	71.82

[A] Based on the forms of the SILs for the NAAQS. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.

3. PSD Increment Analyses

Cumulative impact analyses for the 24-hour PM-2.5 and annual PM-2.5 Class II PSD increments were not necessary, as stated previously. The impacts of ETMT's net emissions increase due to the major modification of MHT were calculated by AERMOD to be less than the 24-hour PM-2.5 and annual PM-2.5 Class II PSD increments. The results of ETMT's Class II PSD increment analyses are summarized in Table 11.

Table 11: Results of ETMT's Class II PSD Increment Analyses

Pollutant	Averaging Time	Modeled Maximum Design Value	Class II PSD Increment	Percent of Class II PSD Increment
		$\mu g/m^3$	$\mu g/m^3$	%
PM-2.5	24-hour[A]	0.17276	9	1.92
	Annual[B]	0.02093	4	0.52

[A] Design value is the highest of the 2nd-highest 24-hour concentrations for each year. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.
[B] Design value is the highest of the annual concentrations for each year. AERMOD results were adjusted upward to account for secondary PM-2.5 formation.

In accordance with 25 *Pa. Code* § 127.45(b)(4), the DEP's notice of proposed plan approval issuance in the *Pennsylvania Bulletin* must include, for sources subject to the PSD regulations, "the degree of increment consumption expected to result from the operation of the source or facility." To this end, the degree of Class II and Class I PSD increment consumption expected to result from ETMT's major modification of MHT is provided in Table 12a and Table 12b, respectively.

Table 12a: Degree of Class II PSD Increment Consumption from ETMT's Major Modification of MHT

Pollutant	Averaging Time	Degree of Class II PSD Increment Consumption		Class II PSD Increment
		$\mu g/m^3$	Percent of Class II PSD Increment	$\mu g/m^3$
NO_2	Annual	0.18437	0.74 %	25
PM-2.5	24-hour	0.17276	1.92 %	9
	Annual	0.02093	0.52 %	4

Table 12b: Degree of Class I PSD Increment Consumption from ETMT's Major Modification of MHT

Pollutant	Averaging Time	Degree of Class I PSD Increment Consumption		Class I PSD Increment
		$\mu g/m^3$	Percent of Class I PSD Increment	$\mu g/m^3$
NO_2	Annual	0.00151	0.06 %	2.5
PM-2.5	24-hour	0.02098	1.05 %	2
	Annual	0.00123	0.12 %	1

4. Confirmation of Air Dispersion Modeling Results

The DEP confirmed the overall results of ETMT's air dispersion modeling by executing AERMOD upon reviewing the appropriateness of all model input, i.e., model options, emission data, downwash data, terrain data, and meteorological data.

IV. Additional Impact Analyses

A. Associated Growth

General commercial, residential, industrial, and other growth associated with ETMT's major modification of MHT is expected to be negligible. Secondary emissions[48] would therefore be negligible and were not included in the additional impact analyses of the impairment to visibility, soils, and vegetation described below.

B. Visibility Impairment

Impairment to visibility due to ETMT's net emissions increase due to the major modification of MHT is expected to be negligible based on a Level-1 plume visual impact screening analysis for John Heinz National Wildlife Refuge at Tinicum using VISCREEN v13190 in accordance with the EPA's guidance.[49]

C. Soils and Vegetation

No adverse impacts to soils and vegetation are expected from ETMT's net emissions increase due to the major modification of MHT. The impacts of ETMT's net emissions increase of criteria pollutants subject to PSD review are calculated by AERMOD to be less than the EPA's ambient screening concentrations.[50] ETMT's net emissions increase of non-criteria pollutants are less than the EPA's SERs.[51]

D. Secondary NAAQS

The DEP notes that the EPA established secondary NAAQS to protect visibility and vegetation, among other things. The impacts of ETMT's net emissions increase due to the major modification of MHT are calculated by AERMOD to be less than the secondary NAAQS for the criteria pollutants subject to PSD review.

V. Class I Area Analyses for AQRVs and Visibility

ETMT provided written notice of its proposed major modification of MHT to the FLMs of the following nearby federal Class I areas: Brigantine Wilderness Area in New Jersey, Shenandoah

[48] *Code of Federal Regulations*. 40 CFR § 52.21(b)(18). Definition of "secondary emissions."
[49] Workbook for Plume Visual Impact Screening and Analysis (Revised) (EPA-454/R-92-023, October 1992).
[50] A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (EPA 450/2-81-078, December 12, 1980). Table 5.3.
[51] Ibid. Table 5.6 and Table 5.7.

National Park in Virginia, and Dolly Sods Wilderness and Otter Creek Wilderness, both in West Virginia.[52] The notice included initial screening calculations, which account for ETMT's net emissions increase (Q) due to the major modification of MHT and distances (D) to these nearby federal Class I areas, to demonstrate that ETMT's net emissions increase would have negligible impacts on AQRVs and visibility in these nearby federal Class I areas.[53] The FLM of each nearby federal Class I area stated that no analyses for AQRVs and visibility would be necessary.[54,55,56] ETMT's initial screening Q/D calculations are summarized in Table 13.

Table 13: ETMT Initial Screening Q/D Calculations for Nearby Federal Class I Areas

Class I Area	Distance (D) from MHT km	ETMT Net Emissions Increase (Q)[A]/ Distance (D) Ratio	FLM Q/D Threshold
Brigantine Wilderness Area, NJ	90	0.95	10
Shenandoah National Park, VA	260	0.33	
Dolly Sods Wilderness, WV	335	0.25	
Otter Creek Wilderness, WV	360	0.24	

[A] Emission Rate (Q) equals the total SO_2, NO_X, PM-10, and H_2SO_4 annual emissions (in tpy) based on 24-hour maximum allowable emissions. Q for MHT = 85.16 tpy.

VI. Conclusions

The DEP's technical review concludes that ETMT's air quality analyses satisfy the requirements of the PSD regulations. Additionally, ETMT provided adequate responses[57] to the DEP's comments[58] on the air quality analyses.

In accordance with 40 CFR § 52.21(k), ETMT's source impact analyses demonstrate that the net emissions increase due to the major modification of MHT would not cause or contribute to air pollution in violation of the NAAQS for CO, NO_2, or PM-2.5. Additionally, ETMT's source impact analyses demonstrate that the net emissions increase due to the major modification of MHT would not cause or contribute to air pollution in violation of the Class II or Class I PSD increments for NO_2 or PM-2.5.

In accordance with 40 CFR § 52.21(l), ETMT's estimates of ambient concentrations are based on applicable air quality models, databases, and other requirements specified in the EPA's

[52] E-mail with attachment from Tom Wickstrom, ERM to U.S. Fish and Wildlife Service, U.S. Forest Service, and National Park Service representatives. February 15, 2022.
[53] U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service, 2010. Federal Land Managers' Air Quality Related Values Work Group (FLAG): Phase I Report – Revised (2010). Natural Resource Report NPS/NRPC/NRR – 2010/232. National Park Service, Denver, CO. Subsection 3.2.
[54] E-mail from Andrea Stacy, National Park Service to Tom Wickstrom, ERM. March 9, 2022.
[55] E-mail from Alexia Prosperi, U.S. Forest Service to Tom Wickstrom, ERM. March 10, 2022.
[56] E-mail from Tim Allen, U.S. Fish and Wildlife Service to Tom Wickstrom, ERM. August 29, 2022.
[57] E-mail with attachment from Tom Wickstrom, ERM to Andrew Fleck, DEP/BAQ/Air Quality Modeling. February 27, 2023.
[58] E-mail with attachment from Daniel J. Roble, DEP/BAQ/Air Quality Modeling to Adam DiAntonio, ERM. August 12, 2022.

Guideline on Air Quality Models[59] as well as the EPA's relevant air quality modeling policy and guidance.

In accordance with 40 CFR § 52.21(m), ETMT provided an analysis of existing ambient air quality in the area that the net emissions increase due to the major modification of MHT would affect that included existing representative ambient monitoring data for CO, NO_2, and PM-2.5. ETMT should be exempted from the requirements of 40 CFR § 52.21(m) for PM and H_2SO_4.

In accordance with 40 CFR § 52.21(n), ETMT provided all information necessary to perform the air quality analyses required by the PSD regulations, including all dispersion modeling data necessary to estimate the air quality impacts of the net emissions increase due to the major modification of MHT.

In accordance with 40 CFR § 52.21(o), ETMT provided additional impact analyses of the impairment to visibility, soils, and vegetation that would occur as a result of the major modification of MHT. General commercial, residential, industrial, and other growth associated with ETMT's major modification of MHT is expected to be negligible.

In accordance with 40 CFR § 52.21(p), written notice of ETMT's proposed major modification of MHT has been provided to the FLMs of nearby federal Class I areas. The notice included initial screening calculations which demonstrate that ETMT's net emissions increase due to the major modification of MHT would have negligible impacts on AQRVs and visibility in nearby federal Class I areas.

All input, output, and data files associated with ETMT's air dispersion modeling for the PSD air quality analyses are available in electronic format upon request.

[59] *Code of Federal Regulations*. 40 CFR Part 51, Appendix W (Guideline on Air Quality Models).

SUNOCO PARTNERS
MARKETING & TERMINALS
An ENERGY TRANSFER Partnership

Via Electronic Mail

February 5, 2021

Mr. David Smith
Air Quality Engineering Specialist
Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Re: Sunoco Partners Marketing & Terminals L.P. – Marcus Hook Industrial Complex
Draft Plan Approval 23-0119E
Emission Reduction Credits

Dear Mr. Smith:

In accordance with Draft Plan Approval 23-0119E Section C Condition #002, and 25 Pa. Code § 127.206(d), Sunoco Partners Marketing & Terminals L.P. (SPMT) is required to surrender 46.35 tons of nitrogen oxides (NOx) Emissions Reduction Credits (ERCs) and 59.07 tons of volatile organic compound (VOC) ERCs to the Pennsylvania Department of Environmental Protection (PADEP) to meet internal offset requirements.

On June 9, 2020, the PADEP approved the transfer of 64 tons per year (tpy) of NOx ERCs from the Exelon Generation Company, LLC facility located in Delaware County, PA to SPMT. The 64 tpy of NOx ERCs were generated from the shutdown at the Eddystone Generation Station facility, Boiler #1, Eddystone Borough, Delaware County, PA, on February 17, 2011, and certified on March 19, 2013. Please include these 64 tpy of NOx ERCs in the final issuance of Plan Approval 23-0119E to meet the internal offset requirements of Plan Approval 23-0119E.

On February 23, 2017, the PADEP approved the transfer of 147.93 tpy of VOC ERCs from Sunoco, Inc. (as successor to Sun Company, Inc.) to SPMT. These ERCs were generated on September 30, 1994 by over-control at the former Marcus Hook Refinery, Delaware County, PA. On April 19, 2002, the DEP certified the VOC ERCs and entered them into the PADEP ERC Registry system. These ERCs do not have an expiration date. SPMT previously surrendered: 4.48 tpy of VOC ERCs from this source to the Department as required by Plan Approval 23-0119E; 0.83 tpy of VOC ERCs from this source to meet the remaining internal offset requirements of Plan Approval 23-0119H; and 53 tpy of VOC ERCs from this source as part of a Stipulation of Settlement with the Clean Air Council and Environmental Integrity Project. Therefore, the current balance from this source is 89.62 tpy of VOC ERCs. Please include 59.07 tpy of VOC ERCs from this source in the final issuance of Plan Approval 23-0119E to meet the internal offset requirements of Plan Approval 23-0119E.

Should you have any questions regarding this letter, please do not hesitate to call me at (610) 859-1279.

Sincerely,

Kevin Smith

Kevin W. Smith
Specialist – Environmental Compliance

Cc: James Rebarchak, Southeast Regional Office (DEP)
Janine Tulloch-Reid, Southeast Regional Office (DEP)
Sean Wenrich, Central Office (DEP)

Sunoco Logistics

Sunoco Partners
Marketing & Terminals L.P.
100 Green Street
Marcus Hook, PA 19061

CERTIFIED MAIL: 7016 0340 0000 1757 3196

March 6, 2017

Krishnan Ramamurthy
Pennsylvania Department of Environmental Protection
Bureau of Air Quality
Rachel Carson State Office Building
400 Market Street, 12th Floor
P.O. Box 8468
Harrisburg, PA 17105-8468

RE: Sunoco Partners Marketing & Terminals L.P.
Plan Approval 23-0119E
Emission Reduction Credit Surrender Letter

Dear Mr. Ramamurthy:

In accordance with Plan Approval 23-0119E Section C Condition #003, and 25 Pa. Code § 127.206(d), Sunoco Partners Marketing & Terminals L.P. (SPMT) is required to surrender the following emissions reduction credits (ERCs) to the Pennsylvania Department of Environmental Protection (DEP) to meet internal offset requirements:

a) 56.1 tons of Volatile Organic Compounds (VOC) ERCs; and
b) 32.8 tons of Nitrogen Oxides (NOx) ERCs.

SPMT currently has 26.46 tons per year (tpy) of VOC ERCs and 38.00 tpy of NOx ERCs in the registry generated from the shutdown of sources at the SPMT Marcus Hook Industrial Complex located in Marcus Hook Borough, Delaware County, PA. These ERCs were certified on August 8, 2012 by the DEP and entered into the ERC registry system. These ERCs expire December 30, 2021. Please remove (surrender) 26.46 tpy of VOC ERCs and 32.8 tpy of NOx ERCs from this source to meet the internal offset requirements. The remaining 29.64 tpy of VOC ERCs required to meet the internal offset requirements will be surrendered from the sources described in the following paragraphs.

Effective February 23, 2017, the DEP approved SPMT's request to transfer 25.16 tpy of VOC ERCs from Sunoco, Inc. (R&M) to SPMT. These ERCs were generated on April 1, 2007 by the shutdown of sources at the 200 Neville Road facility, Allegheny County, PA. On August 8, 2008, the DEP certified the VOC ERCs and entered them into the ERC Registry system. **These ERCs expire April 1, 2017. Please remove (surrender) 25.16 tpy of VOC ERCs from this source prior to the expiration date.** The remaining 4.48 tpy of VOC ERCs required to meet the internal offset requirements will be surrendered from the source described in the following paragraph.

Effective February 23, 2017, the DEP approved SPMT's request to transfer 147.93 tpy of VOC ERCs from Sunoco, Inc. (as successor to Sun Company, Inc.) to SPMT. These ERCs were generated on September 30, 1994 by over-control at the former Marcus Hook Refinery, Delaware

Sunoco Logistics

Sunoco Partners
Marketing & Terminals L.P.
100 Green Street
Marcus Hook, PA 19061

County, PA. On April 19, 2002, the DEP certified the VOC ERCs and entered them into the PADEP ERC Registry system. These ERCs do not have an expiration date. Please remove (surrender) 4.48 tpy of VOC ERCs from this source.

Please surrender (remove) the ERCs from the sources as requested above and update the registry accordingly to reflect the new balances. Please also note that the 25.16 tpy transferred from Sunoco, Inc. (R&M) to SPMT expire on April 1, 2017. SPMT kindly request that these ERCs be surrendered prior to the expiration date.

Should you have any questions, please do not hesitate to call me at (610) 859-1279.

Sincerely,

Kevin W. Smith
Specialist – Environmental Compliance

Cc: James Rebarchak – PADEP Southeast Region
Stephen Todd – PADEP Central Office

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
February 23, 2015
484-250-5920

SUBJECT: Plan Approval Review Memo
SPMT (Sunoco Partners Marketing & Terminals, L.P.)
Marcus Hook Borough, Delaware County
Application No. 23-0119D
APS: 855495, Auth: 1047038

To: James D. Rebarchak
Regional Manager
Air Quality

From: George A Eckert
Permit Reviewer
Air Quality

Through: Janine Tulloch-Reid, PE 2/25/2015
Chief, Facilities Permitting Section
Air Quality

Sunoco Partners Marketing & Terminals, L.P. (SPMT), located at: 100 Green Street, Marcus Hook, PA 19061 (Marcus Hook Borough, Delaware County) has submitted a plan approval application to install the following equipment:

- A total of four (4) cryogenic storage tanks for the storage of liquid ethane, butane and propane;
- Necessary piping for the storage tanks, liquefaction/boil off gas management system, and other components;
- New cold flare for emergency depressurization events;
- New cooling tower; and
- New Pipeline dehydration system – see page 6.

This project will also involve the following (which are not considered to be modifications):
increased throughput of the previously permitted de-ethanizer distillation tower and additional steam demand from the auxiliary boilers (see plan approval 23-0119A and 23-0119B, respectively); and
use of an existing permitted flare located in the state of Delaware.

This project will also modify a previously permitted cold flare ((Source C01) found in plan approval 23-0119).

This project will take place at an existing Title V facility.

SXL – SIC 4226 (Special Warehousing – petroleum and chemical bulk stations) is a bulk chemical storage and fractionation facility. The facility is currently operating under three (3) plan approvals and a Title V permit (as part of the purchase from Sunoco, Inc. (R&M)).

Administrative/Notifications

Application Received:	September 26, 2014
GIF:	Submitted with application
Compliance History:	Submitted with application
Site Location:	100 Green Street, Marcus Hook, PA 19061
Coordination involvement:	None Required
Plan Approval Fee:	$5300.00
Municipal notification:	Township and county notifications received with the application.
Administratively Complete:	October 10, 2014

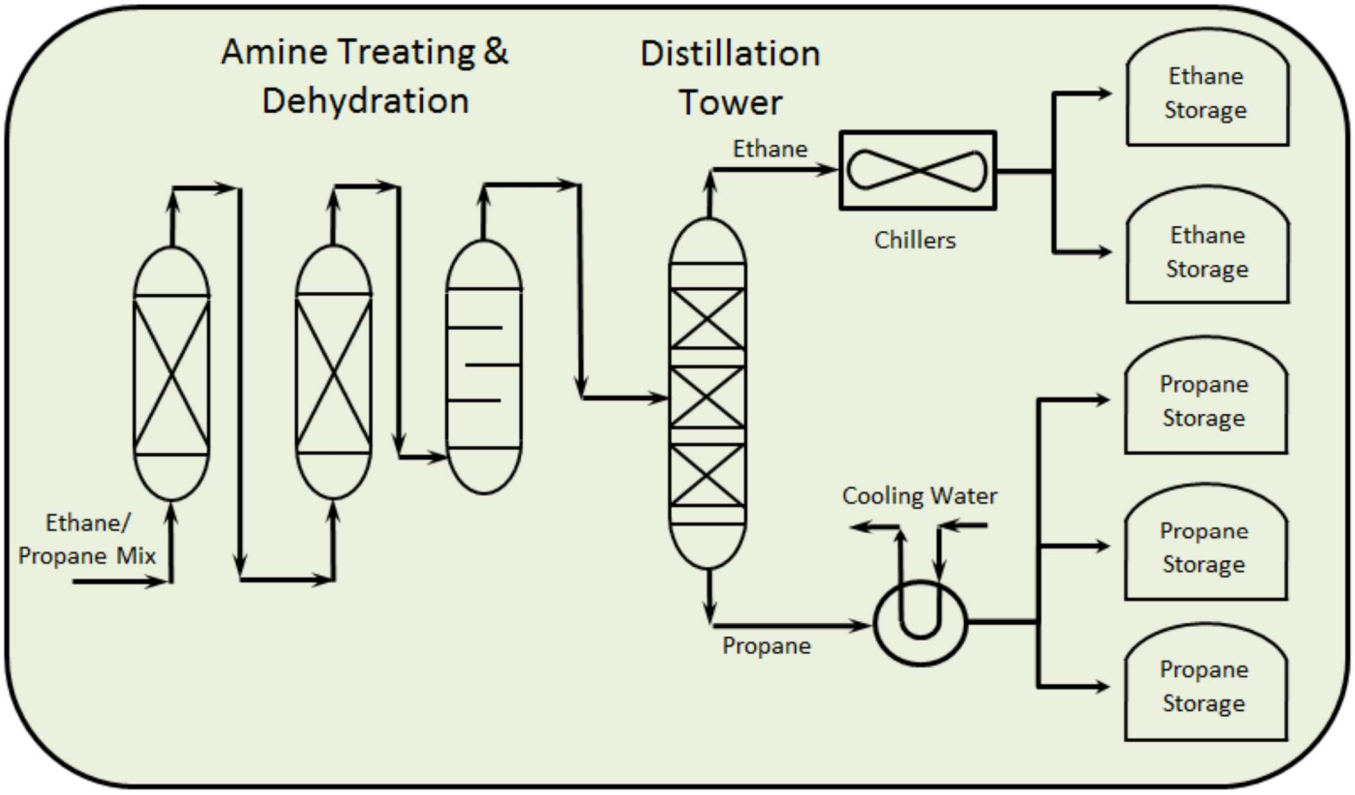
Process Description

This project will provide for the storage of liquefied ethane, propane, and butane products received through an existing pipeline. Product will either be transported as butane, propane, or a mix of ethane/propane. Each feed stock will be transported separately in the pipeline, but there will be some transmix created during transportation. After processing, this transmix will meet the product specification of propane, and will be refrigerated and sent to product storage. After exiting the pipeline, the ethane, propane, and butane will be separated and refrigerated prior to being sent to storage.

Product flow will be as follows:

Ethane/propane mix processing.

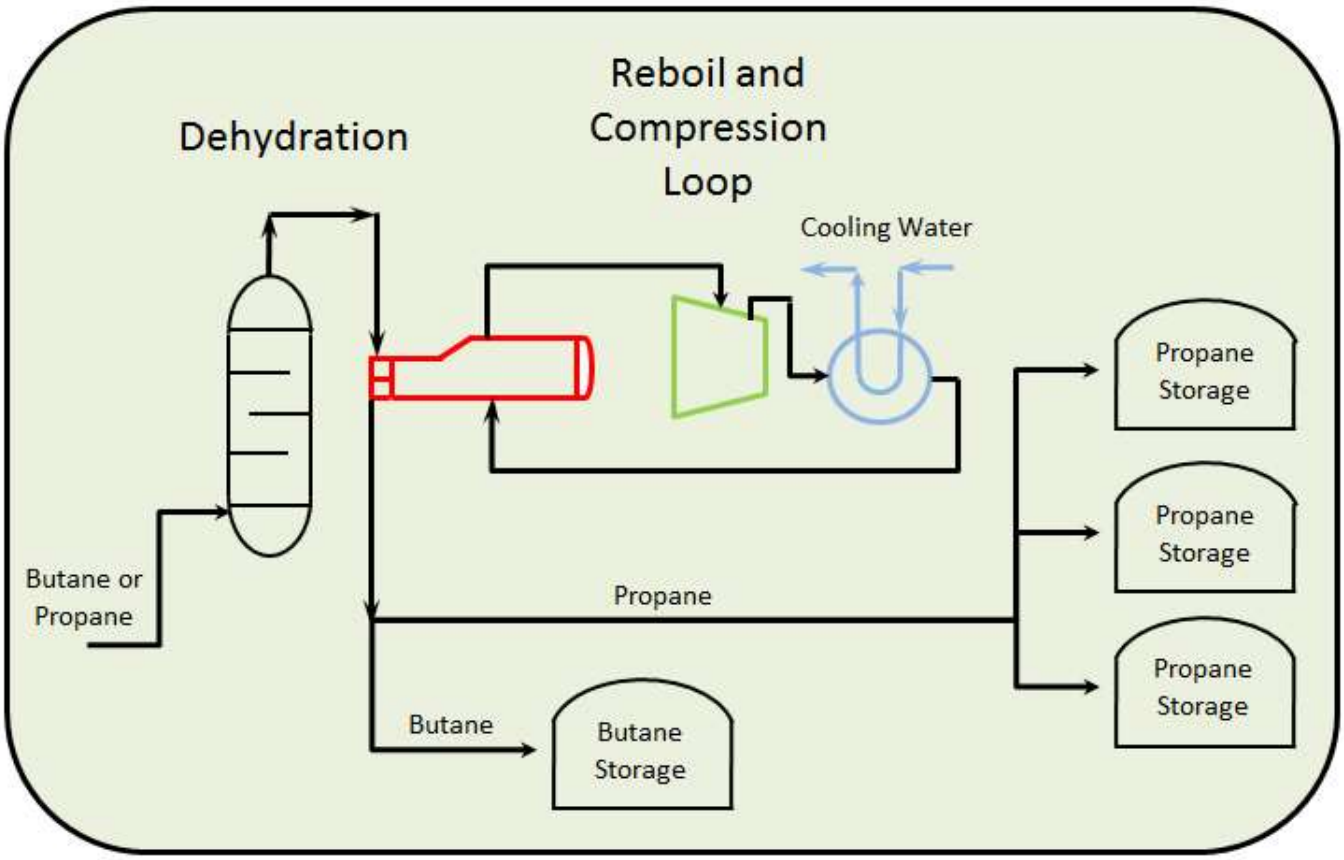
This mix will pass through an amine treatment and dehydration system. Amine treating is used to remove the hydrogen sulfide (H_2S) and carbon dioxide (CO_2) gases as these will corrode the downstream piping components (previously permitted) and the deethanizer separation column (previously permitted). These gases are commonly referred to as sour gases (or acid gases). There are several amines used, with the most common ones being the alkanolamines that are abbreviated as: DEA, MEA, and MDEA. Typically, the flowing amine solution absorbs H_2S and CO_2 from the counter flowing sour gas stream to produce a sweetened gas stream (i.e., a gas free of hydrogen sulfide and carbon dioxide) as a product and an amine solution rich in the absorbed acid gases. No new pollutants will be emitted, as the raw materials, amine treatment and dehydrator, and distillation tower have been previously permitted.



Note that one each of the cryogenic ethane and propane storage tanks in the above drawing were previously permitted under plan approval number 23-0119.

Propane or Butane processing

These products will be treated as outlined in the following diagram. This reboil and compression loop (seen in the drawing below between the dehydration and storage) is actually a refrigeration loop for the incoming propane or butane. The reboilers (long cylindrical object), compressors (trapezoid shape), and chiller (circle) function to remove the heat from these materials, thus refrigerating them.



Storage tanks

The new storage tanks will be as follows:

- one (1) 300,000 bbl cryogenic ethane storage tank (storage will be at 15.42 psia and -135° F);
- one (1) 600,000 bbl cryogenic butane storage tank (storage will be at 15.70 psia and +9° F);
- one (1) 900,000 bbl cryogenic propane storage tank (storage will be at 15.70 psia and -45° F); and
- one (1) 600,000 bbl cryogenic propane storage tank (storage will be at 15.70 psia and -45° F).

These tanks will be double-walled construction and will employ a boil-off gas management system that allows the cryogenic liquids to auto-refrigerate and retain the material as a liquid in its respective tank.

This gas management system is designed to have zero emissions from the tanks, except for fugitive emissions from the various piping components.

Product Loading

The loading of the liquid ethane, propane, and butane into marine vessels will be accomplished using the previously permitted loading docks as follows:

Ethane loading to be performed at docks 1A, 2A, 3A;

Propane and butane loading to be performed at docks 1A, 3A and 3C (note that dock 3C is located in the state of Delaware).

Each of these docks located in Pennsylvania are permitted under plan approval number 23-0119. Each dock contains two identical loading arms and one vapor return line. The loading operation is a closed-loop system, where the boil-off gases are collected, chilled, and returned to the respective product storage tank. At the completion of each loading event, each loading arm is purged with nitrogen to complete the transfer of the liquid products into the marine vessel.

No VOC emissions are expected to be released to the atmosphere, except fugitive emissions from the piping components at each loading arm.

Cold Flares

The previously permitted air-assisted cold flare (See plan approval 23-0119) will be redesigned to include controlling any failures from the new tanks in this project. This new design will include high and low-pressure flare tips.

A new air-assisted low pressure "cold" flare will be installed to be used for flaring streams that are less than -20° F. Flaring for emergency depressurization caused by power failures or equipment exposed to pool fires will be handled by either of the two cold flare (designed for cold temperatures) or the existing flare located in the state of Delaware as it is currently permitted.

Both of these flares will utilize natural gas for the purge gas (1026 scf/hr) and pilot gas (1026 scf/hr) flowing to them on a regular basis to ensure safe and reliable operation, but no process hydrocarbon streams will routinely be vented to either flare. The total heat input to the flare (not counting flaring of hydrocarbons) is 3208.7 MMBtu/yr.

Each flare will have thermocouples installed on the pilots. These monitor the presence of the pilot flames as well as having the ability to indicate ignition failure. If there is an ignition failure, the electronic system is also designed to re-ignite the pilots.

Emissions from the flares are based on expected purge gas and pilot gas flows, AP-42 calculations (Chapter 13, Section 5) and the standards found in 40 CFR 63, Subpart Y. These totals can be found in the Table 2. Note that the original cold flare emissions are negative as that control device will be replaced with the modified cold flare.

Table 1
Purge and pilot gas usage

	Orig. cold Flare	Modified Cold Flare	New Cold Flare	Total for two flares	Units
No. of pilots	1	2	1		
Pilot flow rate	50	65	65	195.0	scf/hr
Purge gas flow (NG)	5.0	110.0	52.0	162.0	scf/hr
Total Gas Flow (NG)	55.0	240.0	117.0	357.0	scf/hr
BTU value	1026	1026	1026	1026	Btu/scf
Operating hours	8,760	8,760	8,760	8,760	hours
Total Heat Input	494.3	2157.1	1051.6	3208.7	MMBtu/yr

Table 2
PTE for Flare emissions (TPY)

Pollutant	NOx	CO	VOC	SO2	CO2e
Original cold flare	-0.02	-0.09	-0.03	-0.0001	-34.35
Modified Cold Flare	0.07	0.40	0.15	0.0006	149.89
New Cold Flare	0.04	0.19	0.07	0.0003	73.07
Cold Flares Summary (total)	0.09	0.50	0.19	0.0008	188.62

Cooling Tower

It has been determined that a new 50,000 gpm cooling tower will be required for the additional boil-off gas management system and the water cooling water loop will contain a mixture of potable water and boiler condensate. This cooling tower will be equipped with high efficiency drift eliminators to reduce the amount of particulate matter emissions to the atmosphere to 0.0005%, using a dissolved solids concentration of 122 ppm in the cooling water. The cooling tower has the potential to emit VOCs and particulate matter, as seen in Table 3, below.

AP-42 establishes particulate matter emission factors from cooling towers, which can be found in Chapter 13, Section 4, of the1995 edition of AP-42. Design changes have taken place since that document was written and newer studies have taken place that provide a more detailed emission estimate for PM (and its subparts) emissions.

Additionally, a study performed by Joel Reisman and Gordon Frisbie of Greystone Environmental Consultants in Sacramento California circa 2001/2002 demonstrated that the particulate matter emissions from cooling towers using the AP-42 factors dramatically overestimated the amount of PM10 and PM2.5. Using the formulas found on page 3 of this this study (See the following link) http://www.energy.ca.gov/sitingcases/palomar/documents/applicants_files/Data_Request_Response/Air Quality/Attachment 4-1.pdf

Based on the following design criteria of the cooling tower:

Design Flow – 50,000 gpm;
Drift Rate – 0.0005% of the circulating water;
Total Dissolved Solids (TDS) – 122 ppm;
Tower water to make up water ratio – 6: and
VOC emission factor – 0.7 lb/MMgal,

SXL has determined that PM10 will account for 95% of the total PM and PM2.5 will account for 14.5% of the total PM.

Lb/hr values for PM are calculated as follows:

50,000 gpm (0.0005/100) (122/1,000,000) (6) (60 min/hr) (8.345 lb/gal) = 0.092 lb/hr = 0.40 tpy

VOC Emissions

These are calculated as follows:

circulation rate (gal/min) X (60 min/hr) X emission factor from AP-42, Table 5.1-2 (lbs/million gal) X (MMgal/1,000,000 gallons)

(50,000 gal/min) X (60 min/hr) X 0.7 lbs/MMgal) X (MMgal/1,000,000 gal) = 2.1 lbs/hr = 9.19 tpy

Table 3

Cooling Tower PTE (TPY)

Pollutant	Potential to Emit (PTE)
VOC	9.19
PM	0.40
PM10	0.38
PM2.5	0.06

Dehydration System

The liquefied hydrocarbon streams will be subjected to super-heated steam for the removal of the entrained water by passing through a series of dehydrators. Super-heated propane will be used to regenerate the dehydrators, thus removing the water from this part of the system. The heat source for the propane will be electric. Air emissions will be fugitive and have been accounted for in the valves and piping table below (Table 5).

Boiler emissions and Steam demand

As stated earlier, this project does not result in a modification to the boilers, just an increase in the previously permitted steam demand. The facility is capable of producing enough steam for its own use from the existing auxiliary boilers permitted under plan approval number 23-0119B, Title V permit number 23-00001, and Pending TVOP 23-00119. Steam demand from these boilers can be found in Table 4, below, and this usage will not result in exceeding any of its current permitted emission limits (found in plan approval 23-0119B):

Table 4
Steam Demand by process/project (lbs/hr)

Distillation tower		11,350	
Amine Still Reboiler		4,514	
Dehydration System		1,515	
Butane Tank Vapor Make-up Vaporizer		5,793	
Pipeline Unit Dehydrators		130,857	
	Current project Subtotal		154,029
Previous Projects			
Base facility demand		200,000	
Plan approval 23-0119A and current project		154,029	
Plan Approval 23-0119B		65,000	
	Facility Total		419,029

Fugitive Emissions

This project includes the installation of new piping equipment, including valves, flanges, and relief valves. The number of components has been conservatively estimated based on preliminary engineering designs and does not include any currently permitted equipment (operating permit or plan approvals).

These fugitive sources are subject to 40 CFR 60, Subpart VVa (Equipment leaks of VOCs in the SOCMI Industry, construction commencing after November 7, 2006). Potential leak estimates are based on the methodologies presented in EPAs Protocol for Equipment Leak Estimates (453/R-95-017). As these sources are new, there is no actual LDAR data available. However, the Texas Commission on Environmental Quality (TCEQ) has an approved LDAR program (28VHP) which indicates expected control efficiencies and the resulting emissions when used in conjunction with the EPA methodologies of VVa. These potential fugitive emissions can be found in Table 5, below.

Table 5
PTE Fugitive Emissions form Piping Components

		No. of Components	VOC Emissions (TPY)
Ethane storage and loading	Valves	552	0.28*
	Pr. Relief Valves	23	0.17*
	Flanges/Connections	345	1.33*
	PTE for CO2e		16.43
Butane storage and loading	Valves	93	0.12
	Pr. Relief Valves	10	0.30
	Flanges/Connections	70	0.87
	PTE of VOC		1.29
	PTE of CO2e		1.50
Propone storage and loading	Valves	880	1.17
	Pr. Relief Valves	42	1.27
	Flanges/Connections	742	9.15
	PTE of VOC		11.58
	PTE of CO2e		1.30
Total VOC (PTE)			14.67
Total CO2e (PTE)			19.23

* Note that while ethane is not classified as a VOC, the ethane is not pure ethane and therefore these emissions are included here. Its make-up is anticipated to be 97.5% ethane, 0.5% methane, and 2.0% propane, by weight.

NEW SOURCE REVIEW (NSR)

This project is being defined as the installation of a new source (cooling tower, several cryogenic tanks and associated piping components) and the modification a previously permitted cold flare.

Each plan approval application at a major facility is required to perform a step 1 and Step 2 analysis for NSR pollutants.

In accordance with 25 Pa. Code § 127.201(f), this facility is subject to the requirements for facilities located in severe nonattainment areas for ozone. This region of Pennsylvania is in nonattainment for NOx, VOC, and PM2.5.

Step 1 (Significant Emission Increase) – 25 Pa. Code § 127.203a. This step only looks at the increases due to each source in the project along with any contemporaneous changes. This cannot be less than zero. If the summation is negative, then zero is entered.

In this step, each unrelated source in the project is looked at to see if the Potential to Emit (PTE) minus its Baseline Actual Emissions (BAE) exceeds the significance threshold of 25 and 10 tons of NOx/VOC and PM2.5, respectively, per year.

Fugitive emissions. PTE for the fugitive VOC emissions from the various piping components is based on an approved LDAR program (TEQ's 28VHP) which indicates expected control efficiencies and emissions when used in conjunction with the EPA methodologies of VVa.

Cooling Tower. PTE for Cooling towers. The VOC emissions are calculated based on AP-42, chapter 5 emission factors, while the PM, PM10, and PM2.5 emissions are based on the Reisman/Frisbie methodology. BAE will be zero.

BAE for the other new sources (fugitive emissions miscellaneous piping and cryogenic tanks) is zero.

Table 6 NSR
BAE and PTE (TPY)

		VOC	NOx/NO2	SOx	CO	PM2.5
PTE	Piping	14.67				
	Cooling Tower	9.19				0.06
	Storage Tanks	0.0				
	Cold Flare**	0.19	0.09	0.0008	0.50	
PTE Total		24.05	0.09	0.0008	0.50	0.06
BAE	Piping	0.0				
	Cooling Tower	0.0		0.0	0.0	0.0
	Storage Tanks	0.0				
	Cold Flare	0.0				
BAE Total		0.0	0.0	0.0	0.0	0.0
PTE minus BAE		24.05	0.09	0.0008	0.50	0.06
NSR significant emission threshold		25.0	25.0	N/A	N/A	10
5-year look back for SXL (from Table 7)		23.51	-4.34	19.31	82.34	*
10 yr look back		23.51	-180.35	19.44	82.34	*

* There is no look-back period for PM2.5.
** Note that the PTE from the cold flare take into account the Original Cold Flare that is to be modified.

A significant emission increase is defined as PTE minus BAE with the result being greater than the significant emission threshold. The Step 1 calculations for NOx, VOC, and PM2.5 are less than the respective thresholds and this project does not trigger NSR as a significant emission increase (Major NSR).

Step 2 – Significant Net Emission Increase (or minor NSR). This step includes increases as well as decreases in emissions from all projects that took place at the facility in the past 5 or 10 year look back period (or shorter, if netting was performed for NOx or VOC).

Additionally, it was determined that the SPMT Marcus Hook and the SPMT Delaware state facilities should be aggregated for the purposes of NSR and PSD applicability.

Since the analysis in Step 1 indicated that the emission increase from this project was less than the significant emission threshold for all NSR pollutants, the review must follow the Department's regulations for minor new source review found in 25 Pa. Code § 127.203a(a)(2).

In this step, each individual source in this project is given its own year look back period coupled with emission increases and decreases (of the same pollutant) at the Marcus Hook facility and at the SPMT support facility located in the state of Delaware, to see if the de minimus change is greater than the significant emission threshold.

Note that some of the data in Table 7 refers to "Sunoco". This is because SPMT purchased the former Sunoco refinery and subsequently the supporting PADEP documents.

SPMT in Marcus Hook most recently netted out for VOC emission in plan approval 23-0119B (issued on January 30, 2013). However, the next plan approval application, number 23-0119C, was considered to be

technically and economically linked to an earlier plan approval, therefore the VOC emission increase in plan approval 23-0119C was aggregated into that netting analysis.

The increase from plan approval 23-0119C was 5.52 tons of VOC. This was offset by the decreases that took place from the shutdown of the sources located in the state of Delaware at the former Sunoco Inc. (R&M) refinery. Delaware saw a total decrease of 7.72 tons of VOC from these shutdown sources. Of this amount, 7.18 tons (5.52 times a ERC multiplier of 1.3) were used to offset the cooling tower installation, leaving 0.54 tons of VOCs as a decrease as seen in table 7.

PM2.5 does not have any de minimus aggregation; therefore this pollutant is not discussed in Step 2.

As demonstrated in Table 6, below, the significant net emission threshold of 25.0 tons for VOC and for NOx emissions will not be exceeded. Therefore, NSR as a significant net emission increase (or de minimus) does not apply to this project.

This project is not subject to LAER.

Table 7
Contemporaneous Look Back Period (TPY)

	Project Description	DATE	VOC	NOX/ NO2	SOx	CO	PM2.5	GHG
Sunoco (Marcus Hook)								
23-A01-822	Ammonia injection cont'd use at the FCC Unit EP	12/16/2004		0.0	0.0	0.0	0.0	0.0
Exempt	Alky cooling project	3/3/2006		0.99	0.13	1.23	0.163	0.0
23-A01-871	Enhanced controls of carbon canisters	8/18/2006		0.0	0.0	0.0	0.0	0.0
23-A01-898	Replace primary seal for storage tank	2/5/2007		0.0	0.0	0.0	0.0	0.0
eRFD 35	water injection into CO boiler combustion zone	6/20/2007		0.0	0.0	0.0	0.0	0.0
eRFD 112	Inject water into CO boiler combustion zone	8/23/2007		-177.0	0.0	0.0	0.0	0.0
eRFD 362	ammonia injection up stream of the electrostatic precipitators at the FCCU	3/14/2008		0.0	0.0	0.0	0.0	0.0
eRFD379	Move injection point ammonia to upstream & use Urea	3/25/2008		0.0	0.0	0.0	0.0	0.0
eRFD 929	Install a chilling system at the FCCU Gas Plant	6/5/2009		0.0	0.0	0.0	0.0	0.0
23-0001AD	SCR installation on Source 113	9/12/2012		0.44	0.53	-1.27	0.05	363.81
SPMT (Marcus Hook)								
23-0119	Cryogenic Propane & Ethane Storage	11/13/2012		0.0	0.0	0.0	0.0	13.29
23-0119A	Dethanizer, Amine Treater, Steam usage	3/4/2013		0.02	0.0	0.0	0.0	48.02
23-0119B	Natural Gasoline Project	9/16/2013		24.4	39.4	99.4	8.13	74,400
23-0119C	Cooling Tower	4/7/2014		0.0	0.0	0.0	0.23	0.0
23-0119D	New Tanks Project	10/3/2014	24.05	0.09	0.00008	0.50	0.07	208
SPMT (Delaware)								
Shutdown	Sulfur Unit #1	2009/10 avg		-2.45	-10.32	-0.53	-0.23	-3495
Shutdown	Sulfur Unit #2	2009/10 avg		-3.21	-10.19	-0.03	-0.46	-2018
Shutdown	Ethylene Cooling Tower	2009/10 avg		0.0	0.0	0.0	-1.51	
Shutdown	17-1P Heater	2009/10 avg		-23.63	-0.11	-16.96	-0.08	-14,912
Shutdown	17-2P Cooling Tower	2009/10 avg	-0.54	0.0	0.0	0.0	-1.65	
Total (5-year look back)			23.51	-4.34	19.31	81.11	4.55	54,158
Total (10- year look back)			23.51	-180.35	19.44	82.34	4.71	54,158

Significant Emission Threshold	25	25/40**	40	100	15*	***

* There is no deminimus aggregation for PM2.5.
** The significant emission threshold for NOx is 25 tons (NSR) and for NO2 is 40 tons (PSD).
*** The significant emission threshold for GHG is both 100,000 tons of CO2e and 250 tons on a mass basis.
Note – Unless speciated, all PM was considered to be PM10 and PM2.5 for a worst-case basis.

Prevention of Significant Deterioration (PSD)

This project is being defined as the installation of a new source (cooling tower, several cryogenic tanks and associated piping components).

SPMT is a major PSD facility. According to the regulations governing PSD, if a facility is major for any of the PSD pollutants, then an applicability analysis must be performed for all PSD pollutants, including GHGs and ozone (and its precursors - NOx and SO2).

The analysis follows the same steps as noted above for NSR in determining if there is a significant emission increase and a significant net emission increase.

The federal PSD rules require s all sources in the project to have the same baseline period and SPMT has chosen the same 24-consecutive month baseline periods as follows as they did for the NSR analysis (calendar years 2009 and 2010).

STEP 1 – Significant Emission Increase

A significant emission increase is calculated as the PTE minus the BAE. This number cannot ever be less than zero. If the result is less than zero, then zero should be entered.

Table 8, below, lists the PSD pollutants, along with the PTE and BAE for each affected source. This table demonstrates that no PSD pollutant, including greenhouse gases, will be emitted at a rate greater than the significant emission threshold.

Table 8
PSD
BAE and PTE (TPY)

		NOx/NO2	PM	PM10	SOx	CO	GHG
PTE	Piping						19.23
	Cooling Tower		0.40	0.38			
	Storage Tanks						
	Cold Flare***	0.09			0.0008	0.50	188.62
PTE Total		0.09	0.04	0.38	0.0008	0.50	208
BAE	Piping						0.0
	Cooling Tower		0.0	0.0	0.0	0.0	0.0
	Storage Tanks						
	Cold Flare						
BAE Total		0.0	0.0	0.0	0.0	0.0	0.0
PTE minus BAE		0.09	0.04	0.38	0.0008	0.50	208
PSD significant emission threshold		40.0 as NO2	25	15	40.0	100	75,000 and 250 Mass**
5-year look back for SXL (from Table 4)		-4.34	4.55	4.55	19.31	82.34	54,158
10 yr look back		-180.35	4.71	4.71	19.44	82.34	54,158

It is noted here that the EPA has stated, “Practically speaking, if the project itself is not significant there is no need to conduct a netting analysis (Step 2)”. As demonstrated in Table 3, above, the emission increase for each PSD pollutant is less than the significant threshold, therefore the PSD analysis is completed.

Federal Regulations

NSPS

40 CFR 60, Subpart VVa (Standards for equipment leaks in the SOCMI Industry). "Synthetic organic chemicals manufacturing industry" as defined in 40 CFR § 60.481a means the industry that produces, as intermediates or final products, one or more of the chemicals listed in 40 CFR § 60.489. Note that propane, ethane, and butane are not listed in this subpart. However, the facility has opted to comply with the LDAR part of this regulation as a means of establishing standards for the fugitive emissions from the new piping components (valves, relief valves, and flanges).

40 CFR 60, Subpart Kb (Volatile Organic Liquid storage vessels, post 7-23-1984). The storage tanks at this facility are subject to this regulation and these have been included in each of the storage tanks. Only the recordkeeping requirements of 40 CFR § 60.115b are applicable due to the high pressures of the materials being stored.

40 CFR 60, Subpart A, General requirements for control devices (60.18). The cold flare is subject to this requirement and the applicable parts have been incorporated into the plan approval.

40 CFR 60, Subpart OOOO (Standards for Crude Oil and Natural Gas Production, Transmission and Distribution). This regulation is mainly for the regulation of oil and natural gas production, except that 40 CFR § 60.5365(f) applies to onshore natural gas processing plant (See definition in 40 CFR § 60.5430) sites unless they are subject to and are controlled according to 40 CFR 60, Subpart VVa. This facility is subject to VVa and therefore is exempted from this subpart.

NESHAP

40 CFR 63, Subpart CC (NESHAP from petroleum refineries). This regulation does not apply as the facility is not primarily engaged in petroleum refining.

40 CFR 63, Subpart Q (NESHAP for Industrial Process Cooling Towers). This regulation is not applicable as the facility does not use chromium-based treatment chemicals in this cooling tower.

CAM (40 CFR, Part 64) CAM does not apply to this project as there are no add-on control devices (as defined in 40 CFR, Part 64) for any of the new sources.

Emission limitations

LDAR establishes guidelines and limitations on the frequency of monitoring, repair and subsequent follow-up monitoring depending on the emission value measured. Based on the estimated number of valves, relief valves, and connectors, the VOC emissions will not exceed 8.38 tons (monitored quarterly). This is not an emission limit.

Best Available Technology (BAT)

Compliance with the LDAR requirements for the fugitives sources complies with BAT.

Stack characteristics

There are no stacks in this project.

Testing

There are no testing requirements, other than those required by the LDAR for requirements.

Monitoring, recordkeeping, and implementation

All recordkeeping is required to be retained for a minimum of five (5) years. The required monitoring and implementation is required to be followed once the facility has completed construction.

Emission Reduction Credits (ERCs) – ERCs are not required for this project.

Public notices – Public notices were sent/published as follows:

- Company was notified by email on January 21, 2015;
- EPA notified via email on January 21, 2015.
- Notice in the PA Bulletin on January 24, 2015; and
- Newspaper notice published in the Delaware County Daily Times on January 23, 24, and 25, 2015.

Comment periods end as follows:

Company (30 days) – January 23, 2015;
Public (30 days) – January 23, 2015; and
EPA (30 days) – February 22, 2015.

Comments were received from the US EPA via email on February 3, 2015 and are addressed below.

Comments were received from the permittee on February 20, 2015 and are addressed at the end of the EPA comments.

EPA COMMENTS

1. **COMMENT** – It is not clear whether NSPS Subpart VVa applied to this project or not.

RESPONSE: - The review memo now clearly states that VVa does apply to this project.

2. **COMMENT:** - Please clarify the number of valves, connectors//flanges, and relief valves are correct. It appears that there should be at least twice as many flanges as there are valves. This can dramatically change the VOC calculations and could affect NNSR for that pollutant.

RESPONSE: - Many of the valves will be socket welded and there are no flanges/connections associated with them. Other valves will have screw or bolted interfaces and the emissions from all flange interfaces have been accounted in the valve total. The emissions listed under flanges/connections are dedicated to those piping locations not associated with valves or pressure relief valves.

3. **COMMENT:** - On Page 7, paragraph 5, of the review memo it is requested to remove the words "Significant emissions".

RESPONSE: - The Department concurs and has removed the wording.

4. **COMMENT:** - Page Sixteen of the plan approval, Condition #005. It is requested to add the specific 28 VHP program requirements to the plan approval.

RESPONSE: - The Department has added conditions pertinent to the plan approval.

5. **COMMENT:** - Page Sixteen of the plan approval, Condition #006. It is unclear from the review memo or the plan approval if any part of the system will be operating under a vacuum. Please clarify and rewrite the condition accordingly.

RESPONSE: - There will be no equipment operating under a vacuum and all references to vacuum have been deleted.

6. **COMMENT:** - Page twenty-three of the plan approval, Condition #004. It is requested that language be added linking this as compliance to the PM limit. It is also recommended to include the calculation method.

RESPONSE: - Language has been added to this condition. Additionally, the formulas used in the VOC, PM, PM10, and PM2.5 calculations have been added to the review memo.

7. **COMMENT:** - Page twenty-three of the plan approval, Condition #002. The language in this condition is unclear and calculations for the "one-sided statistical procedure" should be included. Reference to Part 136 should be more definitive as this is a very large document.

RESPONSE: - This condition has been reworded. The "unclear language" was (and is) derived from 40 CFR § 63.104(b)(3), pertaining to heat exchangers at SOCMI facilities.

8. **COMMENT:** - Page twenty-four of the plan approval, Condition #006. It is not clear how the daily observation ties in with compliance with the LDAR procedures. Additionally, it is not clear that daily observations will be sufficient to assure compliance.

RESPONSE: - The condition now directs the reader to the LDAR conditions when, for example a sheen, odor, or bubbles can be seen rising in the water. Please note that this visual observation is only part of the LDAR program. Note that Condition #003 requires monthly or quarterly sampling of the cooling water and that this sampling frequency is based upon accepted guidelines from other federal regulations (40 CFR 63, Subpart CC).

9. **COMMENT:** - Tanks, condition #006. Please remove the last sentence from each of the tanks.

RESPONSE: - The statement has been removed.

10. **COMMENT:** - Tanks, Condition #005. This condition refers to the "cold flare". Please clarify which flare, or both, is subject to the 95% reduction efficiency requirement.

RESPONSE: - Both flares (C01 and C02) are required to have a minimum of 95% reduction (See plan approval 23-0119, Page 15, Condition #006 for C01)). This 95% reduction has been clarified to be applicable to each flare.

11. **COMMENT:** - Page one of the review memo states that there will be a new dehydration system, but there is no discussion of this source anywhere. Please clarify this.

RESPONSE: - Information on the new dehydration system has been added to the review memo on page 6.

COMPANY COMMENTS

COMMENT: - Ethane fugitive emissions. While ethane is not classified as a VOC, it is requested to count these emissions as VOCs because it is not pure ethane. The assumed ethane components will be 97.5% ethane, 0.5% methane, and 2% propane. Note that these percentages are assumptions; therefore it is requested to include these as VOC emissions.

RESPONSE: - The Department has added these 1.79 tons back into Table 5.

COMMENT: - Source 102, Condition #002. As this facility is subject to the SOCMI regulations of NSPS, Subpart VVa, it is requested that the SOCMI heat exchanger regulations found in 40 CFR 63, Subpart F, be followed instead of the Modified El Paso Method for VOC emissions.

RESPONSE: - The Department concurs and has rewritten the condition.

Recommendation

I recommend issuance of a plan approval for the installation of:

- A total of four (4) cryogenic storage tanks for the storage of liquid ethane, butane and propane;
- Necessary piping for the storage tanks, liquefaction/boil off gas management system, and other components;
- New cold flare for emergency depressurization events;
- New cooling tower;

- A new pipeline dehydration system; and
- The modification of the previously permitted cold flare ((Source C01) found in plan approval 23-0119).

Table F-2
Evaluation of Applicability of 25 PA Code §127.203(b)(1)(i)
Facility Emission Aggregation for Consecutive 5 Calendar-Year Period
Marcus Hook Industrial Complex

Permit No.	Source Description	Date	Emission Rates	
			NO_x (tons/yr)	VOC (tons/yr)
Marcus Hook Industrial Complex				
Pa23-0119	Project Mariner - Ethane/Propane Storage	2/5/2013	---	---
Pa23-0119A	Project Mariner - Deethanizer	9/5/2013	---	---
Pa23-0119B	Natural Gasoline[1]	1/30/2014	---	---
Pa23-0119C	Project Mariner - Cooling Tower[2]	11/19/2014	---	---
Pa23-0119D	New Tanks Project	2/26/2015	---	---
RFD 5236	New Spheres Project	8/13/2015	---	---
RFD 5340	Tank 609 Vapor Pressure Update[3]	10/1/2015	---	---
De Minimis	607/611 Tanks Bridge[4]	1/13/2016	---	0.0
Pa23-0119E	ETP Project Revolution/SXL Depropanizer Project[5]	4/1/2016	---	---
RFD 5597	15-2B Cooling Tower Expansion	4/11/2016	---	0
Pa23-0119F	Storage Tank Update Plan Approval[6]	8/16/2016	---	5.65
RFD 5865	Diesel Tanks and Pumps	8/29/2016	1.56	0.01
Pa23-0119G	Crude Storage Plan Approval	Sept. 2016	---	13.63
RFD 5918	Increased Propane Railcar Offloading Spots	9/26/2016	0.0004	2.19
RFD 5944	Portable Flare for Metering Maintenance	9/26/2016	0.0002	0.0020
De Minimis	Mobile Thermal Oxidizer	10/3/2016	---	1.0
De Minimis	Crude Pump	11/14/2016	---	0.8
RFD 6484	Methanol Removal Project	8/17/2017	---	0.65
	Marcus Hook Industrial Complex 5-Calendar Year Sub-total		*1.56*	*23.95*
	TOTAL		1.56	23.95
	NSR Emission Thresholds		25	25

Notes:

[1] The Natural Gasoline Project triggered NANSR requirements for ozone for the precursor VOC. SPMT provided VOC offsets for the project and contemporaneous emissions of VOC.

[2] SPMT surrendered 7.17 tons of VOC offsets for the 5.52 tons of VOC increases from the cooling tower as it is considered a contemporaneous increase associated with Project Mariner that would have been offset as part of the Natural Gasoline Project permitting.

[3] The VOC emission limit Tank 609 was increased to 5.02 TPY with Request for Determination (RFD) No. 5340 on October 1, 2015. This Storage Tank Update Plan Approval (23-0119F) revised and superseded the VOC emission limit approved by RFD No. 5340.

[4] The emissions for Tank 607 and Tank 611 were offset as part of the Storage Tank Update Plan Approval (23-0119F).

[5] ETP Project Revolution/SXL Depropanizer Project triggered NANSR requirements for ozone for the precursors NOx and VOC. SPMT provided NOx and VOC offsets for the projects and contemporaneous emissions from 2011 through 2015.

[6] The Storage Tank Update Plan Approval (23-0119F) is linked to Natural Gasoline Project because the VOC emissions limits set forth for Tanks 607, 609, and 611 in the Natural Gasoline Plan Approval (23-0119B) were revised. A total of 17.77 tons of VOC offsets were surrendered for the 13.67 tons VOC emissions increase from those three storage tanks.