Contents

1. Introduction

The Pennsylvania Department of Environmental Protection has issued Additional Reasonably Available Control Technology (RACT) Requirements under 25 PA Code 129.96 – 129.100. The regulations apply to major sources of Nitrogen Oxides (NOx) and Volatile Organic Compounds that do not already comply with an existing RACT requirement such as 129.56. The Kinder Morgan Philadelphia Terminal is a major source of Volatile Organic Compounds and thus is applicable to this regulation. The new requirements basically state that a facility meet the presumptive requirements listed or submit alternate RACT proposal for those sources that already do not meet an existing RACT Requirement. The presumptive requirement for VOC sources is maintenance and operation of a source in accordance with manufacturer's specifications for sources that have a potential to emit less than 2.7 tons of VOC per year.

Kinder Morgan has several source that are not subject to a current RACT requirements. These sources are uncontrolled truck, rail car, and marine vessel loading. Other Sources such as storage tanks and controlled loading positions are required to meet existing RACT requirements in the Pennsylvania Code and Philadelphia Air Management Code and do not need to be evaluated.

In order to comply with the new regulation, Kinder Morgan has develop a RACT proposal that follows the requirement of 25 Pa Code 129.99 - RACT Proposal Requirements. According to the regulation the RACT proposal must contain the following:

(1) A list of each source subject to the RACT requirements.
(2) The size or capacity of each affected source and the types of fuel combusted or the types and quantities of materials processed or produced in each source.
(3) A physical description of each source and its operating characteristics.
(4) Estimates of the potential and actual NOx and VOC emissions from each affected source and associated supporting documentation.
(5) A RACT analysis which meets the requirements of 25 Pa Code 129.52(b), including technical and economic support documentation for each affected source.
(6) The testing, monitoring, recordkeeping and reporting procedures proposed to demonstrate compliance with RACT.
(7) A plan approval application that meets the requirements of this article if required under 25 Pa Code 127.11 (relating to plan approval requirements).
(8) An application for an operating permit amendment or application to incorporate the provisions of the RACT proposal.
(9) Additional information requested by the Department that is necessary for the evaluation of the RACT proposal.
(10) Additional information requested by the Department that is necessary for the evaluation of the RACT proposal.

2. Source subject to the RACT requirements

Attachment 1 provides lists of sources at the facility. Even though sources at the facility are subject to RACT requirements, most of the sources are subject to presumptive RACT requirement listed in 25 Pa Code 129 and Air Management Regulation (AMR) V.

3. Affected source capacity of each and the types of materials.

Attachment 1 provides the size and capacity of each affected source. The combustion units primarily burn natural gas with distillate fuel number 2 as backup fuel and the facility is a minor source of Nitrogen Oxide emissions. The storage tanks and other sources are permitted to store or handle VOCs at various vapor pressures as required.

4. Physical Description of Each Source and Operating Characteristics

Combustion Units

The combustion units listed are industrial packaged boiler that are used to heat steam to heat tanks that contain viscous petroleum or organic in order to maintain the viscosity. Natural gas consists of a high percentage of methane (generally above 85 percent) and varying amounts of ethane, propane, butane, and inerts (typically nitrogen, carbon dioxide, and helium). The average gross heating value of natural gas is approximately 1,020 British thermal units per standard cubic foot (Btu/scf), usually varying from 950 to 1,050 Btu/scf.

Storage Tanks

The storage tanks located at the facility are either fixed roof tanks or internal floating roof tanks.

A typical vertical fixed roof tank consists of a cylindrical steel shell with a permanently affixed roof, which may vary in design from cone- or dome shaped to flat. Losses from fixed roof tanks are caused by changes in temperature, pressure, and liquid level.[1]

An internal floating roof tank (IFRT) has both a permanent fixed roof and a floating roof inside. There are two basic types of internal floating roof tanks: tanks in which the fixed roof is supported by vertical columns within the tank, and tanks with a self-supporting fixed roof and no internal support columns. The deck in internal floating roof tanks rises and falls with the liquid level and either floats directly on the liquid surface (contact deck) or rests on pontoons several inches above the liquid surface (noncontact deck). Installing a floating roof minimizes evaporative losses of the stored liquid. Both contact and noncontact decks incorporate rim seals and deck fittings for the same purposes previously described for external floating roof tanks. Evaporative losses from floating roofs may come from deck fittings, nonwelded deck seams,

[1] EPA AP-42, Section 7.1, Page 7.1-1

and the annular space between the deck and tank wall. In addition, these tanks are freely vented by circulation vents at the top of the fixed roof. The vents minimize the possibility of organic vapor accumulation in the tank vapor space in concentrations approaching the flammable range.[2]

Tank Truck, Rail and Marine Vessel Loading positions

Kinder Morgan transfers various VOCs from the storage tanks into tank trucks, rail cars and marine vessels. The tank trucks and rail cars are loaded at numerous racks throughout the facility. Any organic material with a reid vapor pressure of four or greater is controlled using a thermal oxidizer. Marine vessel emissions are uncontrolled except cumene vapors which are vented to a dedicated marine vapor combustor.

5. Potential and Actual VOC emissions

The potential to emit of each source required to have a RACT analysis completed is presented in Table 1 below and actual emissions are presented in Table 2. Marine vessel loading and uncontrolled loading rack positions are the only sources required to complete an updated RACT Analysis.

Typically to estimate the potential emissions from the marine vessel loading operation and loading rack positions, the methodology outlined in the United States Environmental Protection Agency's (USEPA) A-42, Compilation of Air Pollutant Emission Factors, Section 5.2, Transportation and Marketing of Petroleum Liquids was utilized. However, the marine vessel loading is limited to 59 tons of VOC per year based on the Title V Operating permit and the uncontrolled loading rack positions are limited to 129 tons per year.

The key operating parameters are the pumping rate and hours of operation. The operating hours will vary based on the average pumping rate.

To determine the hours of operation for the marine loading, it is assumed that outbound loading at average pumping rate (2,100 gpm) and the annual VOC emissions limit. The operating hours are estimate to be a minimum of 1,076 hours per year.

To determine the hours of operation for an uncontrolled loading position, it is assumed that outbound loading at average pumping rate (450 gpm) and the annual VOC emissions limit. The operating hours are estimate to be a minimum of 3,675 hours per year.

The actual emissions are the average of the past two years of emissions as listed in the terminal's emission statements.

[2] EPA AP-42, Section 7.1, Page 7.1-3 – 7.1-4

Table 1 - Estimated Potential VOC Emissions

Source	Potential Emissions (tons per year)	Potential Emissions (pounds per hour)
All Marine Loading	51	Not Applicable
All Uncontrolled Tank Truck and Rail Car Loading Positions	129	57
Each Uncontrolled Truck and Rail Car Loading Positions Position	9	18.1

Table 2 - Actual VOC Emissions

Source	Potential Emissions (tons per year)	Potential Emissions (pounds per hour)
All Marine Loading	28	Not Determined
All Uncontrolled Tank Truck and Rail Car Loading Positions	1.64	Not Determined
Each Uncontrolled Truck and Rail Car Loading Positions Position	Not Determined	Not Determined

As shown by Table 1, there is a significant difference between the potential emissions and the actual emissions from the operation.

6. A RACT analysis

Most sources at the facility are subject to the presumptive RACT requirements listed in the 25 PA Code 129 and AMR Section V. Per the regulation and Air Management Services letter, the sources subject to presumptive RACT do not need to complete a RACT Analysis. The only operation or source that is not subject to a presumptive RACT is the Marine Vessel Loading. Table 5 provides the presumptive RACT requirement for each source type.

Table 1 - Presumptive RACT Sources

Presumptive RACT	Source Type
25 Pa Code 129.56	Storage Tanks Greater than 40,000 gallons
25 PA Code 129.57	Storage Tanks less than or equal to 40,000 gallons
AMR V, Section V	Controlled Organic Material Loading (i.e., loading racks)
AMR V, Section XIII	Process Equipment Leaks (i.e., piping components)
25 Pa Code 129.93	Combustion Units

Marine loading and uncontrolled tank truck and rail car loading positions are the only operation not subject to a presumptive RACT requirement. Therefore, Marine loading and uncontrolled tank truck and rail car loading positions are the sources that are evaluated under this Case-by-Case RACT analysis. The following provides an analysis per 25 Pa Code 129.92(b).

Possible Control Rankings

Table 2 below provides a listing of Volatile Organic Compound controls and their potential effectiveness for both Uncontrolled Marine Loading, Tank Truck, and Rail Car Loading.

Table 3 - Possible VOC Control and Estimated Effectiveness

Control	Estimated Effectiveness*
Thermal Oxidation	95-98%
Carbon Adsorption	85-95%
Bioreactor	60-99%
Scrubbers	50-98%
Condensation	50-90%

*Does not include capture efficiency

Technically Feasibility Evaluation

Thermal Oxidation

Thermal Oxidation is a process in which the hydrocarbons in a gas stream are combusted to basically form carbon dioxide and water at and elevated temperature. Thermal Oxidation is governed by temperature, time and turbulence. In order to achieve effective combustion the organic must be raised 100°F or more above its ignition temperature and held at that temperature for 0.3 to 1.0 seconds. In addition, the stream must be sufficiently mixed in order for good oxidation to occur. An auxiliary fuel is required to ensure the temperate is maintained for proper combustion.

There are essential two types of incinerators: thermal and catalytic. Each type is considered technically feasible for the marine loading operation. However, for cost analysis purposes, thermal incineration is being considered since the relative cost of the two are similar.

Kinder Morgan has existing thermal oxidation control units: one for controlling materials with a vapor pressure greater than 4 psia when loading tank truck and rail cars and a thermal oxidation unit for controlling cumene vapors when loading marine vessels. Kinder Morgan cannot utilize these controls as they are either at design capacity or the design of the unit is limited and is owned by Kinder Morgan's customer.

Carbon Adsorption

Adsorption is where gas molecules are passed though a bed of solid particles, then diffuses from the gas steam to the bed, and held on the media by attractive forces. Adsorptive capacity of the solid for the gas tends to increase with the gas phase concentration, molecular weight, diffusivity, polarity, and boiling point.

Typical adsorbents media in use include activated carbon, silica gel, activated alumina, synthetic zeolites, fuller's earth, and other clays. This RACT analysis is oriented toward the use of activated carbon, a commonly used adsorbent for VOCs. Carbon adsorption is effective when materials have a molecular weight of 50 or greater.

Carbon Adsorption is considered technically infeasible for the operation since it would not be effective on all materials handled at the dock. A fair amount of ethanol and possibly other materials such as ketones are loaded into vessels, trucks and rail cars. The molecular weight of ethanol is 46, thus making carbon adsorption infeasible and ketones can cause fires in the carbon beds.

Bioreactor

There are several different types of bioreactors from soil beds or bio-filters to bio-trickling filters, and bio-scrubbers. Typically used for odor control, bioreactors can be used to oxidize VOC's. For a bioreactor to be effective, one needs a consistent stream and maintain temperature above 60°F. The loading operations at Kinder Morgan is intermittent and the climates average annual temperature is below 60°F (i.e., 54-56°F). While there are other factor to consider this control option is considered technically infeasible due the intermittent nature of the operation and the climate of the area.

Scrubbers

Scrubbers use a process called absorption to remove pollutants from an air stream to a liquid stream. The absorption process the organics in the air stream are dissolved in a liquid solvent. The limiting factors as a primary control technique deal with the availability of a suitable solvent and the solubility of the organic. In this case, the terminal would require different solvents to handle the varying material handled. Based on the organics in the air stream requiring different absorption media this control option is considered technically infeasible.

Condensation

Refrigeration units are basically "heat pumps," absorbing heat on the "cold side" of the system and releasing heat on the "hot side" of the system.

A refrigerated condenser is a viable control option if:

- the air stream is saturated with the organic compound
- the organic vapor containment system limits air flow
- required air flow does not overload a refrigeration system with heat
- only one organic compound is emitted

Since the loading operations are only considered to be 50 percent saturated and there are multiple organic compounds, this control option is considered infeasible.

Submerged Fill

Kinder Morgan does provide submerged fill for all organic materials that have a flash point less than 200 Degrees Fahrenheit into tank truck and rail cars. All Marine vessels are submerged fill. A study has shown that there is a direct correlation for pure organic compounds of the Flash to Vapor Pressure. The study has shown the inverse of the flash point is linear to the logarithm of the vapor pressure. Thus the high the flash point the lower the correlated vapor pressure would be.

Technically Feasible Control Ranking

Table 3 below provides a ranking of the technically feasible control option in order of overall control effectiveness for VOC emissions includes the following information as require by 25 Pa Code 129.92(b)(3),:

1. The baseline emissions of VOCs before implementation of each control option.
2. The estimated emission reduction potential or the estimated control efficiency of each control option.
3. The estimated emissions after the application of each control option.
4. The economic impacts of each control option, including both overall cost effectiveness and incremental cost effectiveness.

To determine the cost effectiveness of technically feasible control option, a cost analysis was conducted and is presented in Attachment 2. Based on a vendor quote for another project, the capital cost for the thermal oxidizer is presented in the table below.

Table 4 - Control Costs

Source	Total Capital Investment	Annual Operating Cost
Marine Vessel Loading	$918,846.63	$829,261.61
Per Uncontrolled Loading Rack Position	$323,283.95	$198,326.45
All Uncontrolled Loading position together	$3,038,318.71	$1,900,430.61

The cost estimates are consistent with the EPA Air Pollution Control Costs Manual, Version 6. The annual costs include operating and maintenance labor, fuel and electrical costs, and a capital depreciation of 7 percent over 10 years.

Table 5 - Control Rankings for Marine Vessel Loading

Rank	Control Option	Baseline VOC, tpy	Estimated reduction in emissions[3]	Emissions after control, tpy	Cost Effectiveness, $/ton	Incremental Cost Effectiveness, $
1	Thermal Oxidation	51	83%	8.5	$19,512.04	Not Applicable

[3] Includes 85% capture efficiency based on Emission Estimation Protocol for Petroleum Refineries, Section 9, Table 9-5, 2011, Page -9-7

Table 6 - Control Rankings for Rack Loading Position

Rank	Control Option	Baseline VOC, tpy	Estimated reduction in emissions[4]	Emissions after control, tpy	Cost Effectiveness, $/ton	Incremental Cost Effectiveness, $
1	Thermal Oxidation	9	90%	1	$24,484.75	Not Applicable

Table 7 - Control Rankings for all uncontrolled Loading Rack Position

Rank	Control Option	Baseline VOC, tpy	Estimated reduction in emissions[5]	Emissions after control, tpy	Cost Effectiveness, $/ton	Incremental Cost Effectiveness, $
1	Thermal Oxidation	129	90%	12.9	$17,678.42	Not Applicable

The costs of the technically feasible controls are based on vendor quotes and readily available literature.

Based on the current permitted values the technically feasible controls are not cost effective for Marine Vessel or Tank Truck/Rail Car Loading and thus do not meet RACT.

7. Schedule for completing implementation of the RACT proposal

Kinder Morgan will be in compliance with the Proposed RACT Emission Limits by Jan 1, 2017

[4] Based on NJDEP RACT requirements for loading volatile organic compounds 7:27 N.J.A.C. Subchapter 16

[5] Based on NJDEP RACT requirements for loading volatile organic compounds 7:27 NJAC Subchapter 16

8. The testing, monitoring, recordkeeping and reporting procedures proposed to demonstrate compliance with RACT.

Although the regulation requires sources subject to the RACT requirements under 129.97 are required to test by January 1, 2017, Kinder Morgan's sources are not subject to these requirements. Testing the uncontrolled positions at the terminal using an epa method is not feasible since they do not have stacks no continuously operate. Therefore Kinder Morgan proposes the following monitoring and recordkeeping:

- Kinder Morgan shall monitor throughput of material processed and vapor pressures for all tanks, marine loading, and tank car/truck loading racks on a daily basis.
- For tank car/truck loading operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:
  (1) Which rack is being used for loading;
  (2) Which position at each rack is being used for loading;
  (3) Whether the position being used for loading is controlled or uncontrolled;
  (4) The name of material loaded per position;
  (5) Throughputs of each material loaded per position;
  (6) The corresponding vapor pressures of the material loaded per position;
  (7) Emissions calculations per position on a monthly and rolling 12-month period.
- For marine vessel loading operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:
  (1) The name of material loaded;
  (2) Whether the loading is controlled or uncontrolled;
  (3) Throughputs of each material loaded;
  (4) The corresponding vapor pressures of the material loaded;
  (5) Emission calculations on a monthly and rolling 12-month period;
  (6) Marine loading gasoline and crude oil throughput records clen1onstrating co1npliance with Condition 2E on a monthly basis.

9. A plan approval application that meets the requirements of this article if required under § 127.11 (relating to plan approval requirements).

Although Kinder Morgan is not proposing to install a control with this RACT Proposal, a plan approval is being submitted for the proposed emissions limits in the existing RACT Plan Approval. The application is provided

10. An application for an operating permit amendment or application to incorporate the provisions of the RACT proposal.

Kinder Morgan is not proposing to install a control with this RACT Proposal. Therefore, an operating permit application amendment is not required.

11. Additional information requested by the Department that is necessary for the evaluation of the RACT proposal.

Air Management Services has not requested any additional information at this time. However, Kinder Morgan will respond to any requests

12. Conclusion

Kinder Morgan has shown that the only operations not subject a presumptive RACT requirements are marine vessel loading and uncontrolled loading positions.

The marine vessel loading the operation has the potential to emit of 51 tons VOC per year. At this level, the one technically possible control is economically infeasible. Although Kinder Morgan has a Marine Vapor Combustor to control cumene emissions, it was not evaluated for other VOC materials since Kinder Morgan is contractually obligated to have the MVC available for their customer who paid for the unit. Therefore, Kinder Morgan's current marine loading operations meet the RACT Requirements.

Kinder Morgan will take an emission limitation for the uncontrolled loading positions of 9 tons per year per position while maintaining the overall limitation of 129 tons per year for the combined uncontrolled position. Since Kinder Morgan is a for hire terminal, the 9 ton per year limit will provide sufficient operational flexibility to help ensure it does not affect future business prospects.

However, Kinder Morgan will continue to provide submerged fill for all organic materials that have a flammability limit of 200 Degrees Fahrenheit into tank truck and rail cars and Marine vessels are submerged fill.

13. References

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- USEPA, AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, 1995
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- Vatavuk, William M., Estimating Cost of Air Pollution Control, 1990.
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Attachment 1 – Facility Sources

Source	Unit Type	Capacity	Units	Material
Two Combustion Units, CU02, CU01A	Combustion	13.4 and 12.6	MMBtu/hr	Natural Gas/No2 Fuel Oil
Internal Combustion Engines: EG01, AC-01, AC-02	Process	490, 48, 48	hp	Diesel
P051	Storage Tank	5382	Gal	Organic/Inorganic Materials
P052	Storage Tank	5363	Gal	Organic/Inorganic Materials
P053	Storage Tank	5387	Gal	Organic/Inorganic Materials
P054	Storage Tank	5375	Gal	Organic/Inorganic Materials
P055	Storage Tank	5341	Gal	Organic/Inorganic Materials
P056	Storage Tank	5345	Gal	Organic/Inorganic Materials
P057	Storage Tank	5364	Gal	Organic/Inorganic Materials
P058	Storage Tank	5367	Gal	Organic/Inorganic Materials
P104	Storage Tank	419527	Gal	Organic/Inorganic Materials
P105	Storage Tank	417744	Gal	Organic/Inorganic Materials
P106	Storage Tank	556755	Gal	Organic/Inorganic Materials
P107	Storage Tank	127039	Gal	Organic/Inorganic Materials
P108	Storage Tank	126882	Gal	Organic/Inorganic Materials
P121	Storage Tank	214548	Gal	Organic/Inorganic Materials
P122	Storage Tank	428569	Gal	Organic/Inorganic Materials
P123	Storage Tank	738192	Gal	Organic/Inorganic Materials
P124	Storage Tank	1584987	Gal	Organic/Inorganic Materials
P125	Storage Tank	2124954	Gal	Organic/Inorganic Materials
P126	Storage Tank	214748	Gal	Organic/Inorganic Materials
P127	Storage Tank	422780	Gal	Organic/Inorganic Materials
P128	Storage Tank	425518	Gal	Organic/Inorganic Materials
P129	Storage Tank	739384	Gal	Organic/Inorganic Materials
P130	Storage Tank	126804	Gal	Organic/Inorganic Materials
P131	Storage Tank	126246	Gal	Organic/Inorganic Materials
P133	Storage Tank	843751	Gal	Organic/Inorganic Materials

P134	Storage Tank	427695	Gal	Organic/Inorganic Materials
P135	Storage Tank	636524	Gal	Organic/Inorganic Materials
P137	Storage Tank	224621	Gal	Organic/Inorganic Materials
P140	Storage Tank	126854	Gal	Organic/Inorganic Materials
P141	Storage Tank	425715	Gal	Organic/Inorganic Materials
P142	Storage Tank	210694	Gal	Organic/Inorganic Materials
P143	Storage Tank	406159	Gal	Organic/Inorganic Materials
P144	Storage Tank	428500	Gal	Organic/Inorganic Materials
P145	Storage Tank	424621	Gal	Organic/Inorganic Materials
P146	Storage Tank	423555	Gal	Organic/Inorganic Materials
P147	Storage Tank	424660	Gal	Organic/Inorganic Materials
P148	Storage Tank	795557	Gal	Organic/Inorganic Materials
P149	Storage Tank	401184	Gal	Organic/Inorganic Materials
P150	Storage Tank	403777	Gal	Organic/Inorganic Materials
P151	Storage Tank	799391	Gal	Organic/Inorganic Materials
P152	Storage Tank	806968	Gal	Organic/Inorganic Materials
P153	Storage Tank	424961	Gal	Organic/Inorganic Materials
P154	Storage Tank	447628	Gal	Organic/Inorganic Materials
P155	Storage Tank	844179	Gal	Organic/Inorganic Materials
P156	Storage Tank	857938	Gal	Organic/Inorganic Materials
P157	Storage Tank	424207	Gal	Organic/Inorganic Materials
P158	Storage Tank	424711	Gal	Organic/Inorganic Materials
P159	Storage Tank	813594	Gal	Organic/Inorganic Materials
P160	Storage Tank	808142	Gal	Organic/Inorganic Materials
P161	Storage Tank	819026	Gal	Organic/Inorganic Materials
P162	Storage Tank	840926	Gal	Organic/Inorganic Materials
P163	Storage Tank	815172	Gal	Organic/Inorganic Materials
P164	Storage Tank	816371	Gal	Organic/Inorganic Materials
P198	Storage Tank	315436	Gal	Organic/Inorganic Materials
P199	Storage Tank	314782	Gal	Organic/Inorganic Materials
P200	Storage Tank	312077	Gal	Organic/Inorganic Materials
P201	Storage Tank	313882	Gal	Organic/Inorganic Materials

P202	Storage Tank	216331	Gal	Organic/Inorganic Materials
P203	Storage Tank	216331	Gal	Organic/Inorganic Materials
P204	Storage Tank	1264372	Gal	Organic/Inorganic Materials
P205	Storage Tank	510742	Gal	Organic/Inorganic Materials
P206	Storage Tank	509983	Gal	Organic/Inorganic Materials
P207	Storage Tank	511025	Gal	Organic/Inorganic Materials
P208	Storage Tank	509305	Gal	Organic/Inorganic Materials
P209	Storage Tank	506425	Gal	Organic/Inorganic Materials
P210	Storage Tank	510762	Gal	Organic/Inorganic Materials
P211	Storage Tank	509101	Gal	Organic/Inorganic Materials
P212	Storage Tank	509189	Gal	Organic/Inorganic Materials
P213	Storage Tank	266663	Gal	Organic/Inorganic Materials
P214	Storage Tank	289802	Gal	Organic/Inorganic Materials
P215	Storage Tank	281774	Gal	Organic/Inorganic Materials
P216	Storage Tank	267219	Gal	Organic/Inorganic Materials
P217	Storage Tank	511150	Gal	Organic/Inorganic Materials
P218	Storage Tank	510164	Gal	Organic/Inorganic Materials
P219	Storage Tank	509300	Gal	Organic/Inorganic Materials
P220	Storage Tank	510457	Gal	Organic/Inorganic Materials
P221	Storage Tank	509672	Gal	Organic/Inorganic Materials
P222	Storage Tank	509557	Gal	Organic/Inorganic Materials
P223	Storage Tank	470864	Gal	Organic/Inorganic Materials
P224	Storage Tank	471176	Gal	Organic/Inorganic Materials
P225	Storage Tank	470665	Gal	Organic/Inorganic Materials
P226	Storage Tank	473195	Gal	Organic/Inorganic Materials
P227	Storage Tank	473101	Gal	Organic/Inorganic Materials
P228	Storage Tank	925384	Gal	Organic/Inorganic Materials
P301	Storage Tank	1141483	Gal	Organic/Inorganic Materials
P302	Storage Tank	3776119	Gal	Organic/Inorganic Materials
P303	Storage Tank	981752	Gal	Organic/Inorganic Materials
P304	Storage Tank	3989566	Gal	Organic/Inorganic Materials
P305	Storage Tank	318301	Gal	Organic/Inorganic Materials

P420	Storage Tank	20079	Gal	Organic/Inorganic Materials
P421	Storage Tank	6047	Gal	Organic/Inorganic Materials
P422	Storage Tank	3138	Gal	Organic/Inorganic Materials
P440	Storage Tank	35282	Gal	Organic/Inorganic Materials
P450	Storage Tank	31281	Gal	Organic/Inorganic Materials
P451	Storage Tank	31264	Gal	Organic/Inorganic Materials
P460	Storage Tank	12047	Gal	Organic/Inorganic Materials
P470	Storage Tank	10012	Gal	Organic/Inorganic Materials
P471	Storage Tank	2000	Gal	Organic/Inorganic Materials
P481	Storage Tank	29996	Gal	Organic/Inorganic Materials
P482	Storage Tank	29996	Gal	Organic/Inorganic Materials
P483	Storage Tank	29996	Gal	Organic/Inorganic Materials
P484	Storage Tank	29996	Gal	Organic/Inorganic Materials
P485	Storage Tank	29997	Gal	Organic/Inorganic Materials
P486	Storage Tank	29996	Gal	Organic/Inorganic Materials
P487	Storage Tank	29996	Gal	Organic/Inorganic Materials
P488	Storage Tank	29996	Gal	Organic/Inorganic Materials
P489	Storage Tank	20000	Gal	Organic/Inorganic Materials
P490	Storage Tank	20000	Gal	Organic/Inorganic Materials
FT00	Storage Tank	2500	Gal	Organic/Inorganic Materials
FT01	Storage Tank	2500	Gal	Organic/Inorganic Materials
FT02	Storage Tank	2500	Gal	Organic/Inorganic Materials
FT03	Storage Tank	2500	Gal	Organic/Inorganic Materials
Marine Vessel Loading	Process	2100	Gallons/hr	Organic/Inorganic Materials
Uncontrolled Tank Truck/Tank Car Loading	Process	Varies		Organic/Inorganic Materials
A Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
B Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials

C Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
D Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
E Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
F Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
G Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
H Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
M Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials

N Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
O Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
P Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
R Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
X Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
R-1 Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck	450	Gallons/min	Organic/Inorganic Materials
V Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
DSP RACK	Truck	450	Gallons/min	Organic/Inorganic Materials
Rail Siding 1	1	450	Gallons/min	Organic/Inorganic Materials
	2	450	Gallons/min	Organic/Inorganic Materials
	3	450	Gallons/min	Organic/Inorganic Materials
	4	450	Gallons/min	Organic/Inorganic Materials

	5	450	Gallons/min	Organic/Inorganic Materials
Rail Siding 2	1	450	Gallons/min	Organic/Inorganic Materials
	2	450	Gallons/min	Organic/Inorganic Materials
	3	450	Gallons/min	Organic/Inorganic Materials
	4	450	Gallons/min	Organic/Inorganic Materials
	5	450	Gallons/min	Organic/Inorganic Materials
	6	450	Gallons/min	Organic/Inorganic Materials
	7	450	Gallons/min	Organic/Inorganic Materials
	8	450	Gallons/min	Organic/Inorganic Materials
	9	450	Gallons/min	Organic/Inorganic Materials
	10	450	Gallons/min	Organic/Inorganic Materials
	11	450	Gallons/min	Organic/Inorganic Materials
	12	450	Gallons/min	Organic/Inorganic Materials
Rail Siding 3	1	450	Gallons/min	Organic/Inorganic Materials
	2	450	Gallons/min	Organic/Inorganic Materials
	3	450	Gallons/min	Organic/Inorganic Materials
	4	450	Gallons/min	Organic/Inorganic Materials
	5	450	Gallons/min	Organic/Inorganic Materials
	6	450	Gallons/min	Organic/Inorganic Materials
	7	450	Gallons/min	Organic/Inorganic Materials

Controlled Tank Truck/Tank Car Loading	Process	Varies	Gallons/hr	Organic/Inorganic Materials

A Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck		Gallons/min	Organic/Inorganic Materials
D Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
Spot 1-1	Rail	450	Gallons/min	Organic/Inorganic Materials
E Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
F Rack	Truck	1200	Gallons/min	Organic/Inorganic Materials
	Truck		Gallons/min	Organic/Inorganic Materials
M Rack	Truck	450	Gallons/min	Organic/Inorganic Materials
	Truck		Gallons/min	Organic/Inorganic Materials

Fugitive Piping	Process	Varies	N/A	Organic/Inorganic Materials
Insignificant Sources				
Maint1	Sand Blasting of Tanks	N/A	N/A	N/A
Maint2	Painting of Tanks	N/A	N/A	N/A
Waste1	Sump Tank	N/A	N/A	N/A
Waste2	Catch Basins	N/A	N/A	N/A
Waste3	Oil Water Separator(Receives <200 gallons of organic materials per day)	N/A	N/A	N/A
Drum	Drumming Operations	N/A	N/A	N/A
Steam	Steam Cleaning of Equipment	N/A	N/A	N/A
Dry	Chemical Dryers	N/A	N/A	N/A
Pipe	Pipe Cleaning	N/A	N/A	N/A
Flush	Flushing of Tanks with Incoming Products	N/A	N/A	N/A
Fire	Fire Equipment	N/A	N/A	N/A
Mobile	Mobile Tanks(500 gallons each)	N/A	N/A	N/A

Attachment 2 – Control Device Costing

Direct Cost		
Purchased Equipment	$522,950.94	Vendor Quote Attached
Instrumentation -		
Sales Tax	$31,377.06	
Freight	$26,147.55	
Purchased Equipment Cost	**$580,475.55**	
Direct Installation Cost		
Foundations & supports		
	$46,438.04	
Handling & erection	$81,266.58	
Electrical	$23,219.02	
Piping	$11,609.51	
Insulation for ductwork	$5,804.76	
Painting	0	
Direct installatoin costs	**$168,337.91**	
Site Preparation	$5,804.76	
Total Direct Cost	$754,618.22	
Indirect Cost		
Engineering	$58,047.56	
Construction and field expenses	$29,023.78	
Contractor fees	$58,047.56	
Start-up	$11,609.51	
Performance test	$7,500.00	
Total Indirect Cost	$164,228.41	
Total Capital Investment	**$918,846.63**	

Annual Costs			
Hours of operation	1,076		
Direct Annual Costs			
Operating Labor	0.5 hrs/shift @ $18/hr	$	1,210.50
Supervisor 15% of operator		$	181.58
Operating Materials -			
Maintenance			
Labor 0.5 hr/shift $25/hr		$	6,843.75
Materials 100% of maintenance labor		$	6,843.75
Natural Gas	1.16 per therm	$	636,583.55
Electrcity	0.162/kwh	$	953.10
Total		**$**	**652,616.23**
Indirect Annual Cost			
Overhead 60% of sum of operating supervisor, & maintenance labor & maintenance materials		$	9,047.75
Administrative Charges 2% TCI - 9,650 17,800			$18,376.93
Property Taxes 1% TCI - 4,830 8,900			$9,188.47
Insurance 1% TCI - 4,830 122,700			$9,188.47
Capital recovery (7% over 10 years)			$130,843.76
Total IAC			**$176,645.38**
Total Annual Cost			**$829,261.61**
Precontrol Emissions			**51**
Controlled Emissions			**42.5** 8.5
Cost Effectiveness			**$19,512.04**

Direct Cost		
Purchased Equipment	$1,706,542.07	Vendor Quote Attached
Instrumentation	-	
Sales Tax	$102,392.52	
Freight	$85,327.10	
Purchased Equipment Cost	**$1,894,261.69**	
Direct Installation Cost		
Foundations & supports	$151,540.94	
Handling & erection	$265,196.64	
Electrical	$75,770.47	
Piping	$94,713.08	
Insulation for ductwork	$18,942.62	
Painting	0	
Direct installatoin costs	**$606,163.75**	
Site Preparation	$18,942.62	
Total Direct Cost	$2,519,368.06	
Indirect Cost		
Engineering	$189,426.17	
Construction and field expenses	$94,713.08	
Contractor fees	$189,426.17	
Start-up	$37,885.23	
Performance test	$7,500.00	
Total Indirect Cost	$518,950.65	
Total Capital Investment	**$3,038,318.71**	

Annual Costs			
Hours of operation	8,760		
Direct Annual Costs			
Operating Labor	0.5 hrs/shift @ $18/hr	$	9,855.00
Supervisor 15% of operator		$	1,478.25
Operating Materials -			
Maintenance			
Labor 0.5 hr/shift $25/hr		$	6,843.75
Materials 100% of maintenance labor		$	6,843.75
Natural Gas	1.16 per therm	$	1,298,448.62
Electrcity	0.162/kwh	$	7,759.46
Total		**$**	**1,331,228.83**
Indirect Annual Cost			
Overhead 60% of sum of operating supervisor, & maintenance labor & maintenance materials		$	15,012.45
Administrative Charges 2% TCI - 9,650 17,800			$60,766.37
Property Taxes 1% TCI - 4,830 8,900			$30,383.19
Insurance 1% TCI - 4,830 122,700			$30,383.19
Capital recovery (7% over 10 years)			$432,656.58
Total IAC			**$569,201.78**
Total Annual Cost			**$1,900,430.61**
Precontrol Emissions			**129**
Controlled Emissions			**107.5**
Cost Effectiveness			**$17,678.42**

Direct Cost		
Purchased Equipment	$181,203.85	Vendor Quote Attached
Instrumentation	-	
Sales Tax	$10,872.23	
Freight	$9,060.19	
Purchased Equipment Cost	**$201,136.27**	
Direct Installation Cost		
Foundations & supports	$16,090.90	
Handling & erection	$28,159.08	
Electrical	$8,045.45	
Piping	$4,022.73	
Insulation for ductwork	$2,011.36	
Painting	0	
Direct installatoin costs	**$58,329.52**	
Site Preparation	$2,011.36	
Total Direct Cost	$261,477.15	
Indirect Cost		
Engineering	$20,113.63	
Construction and field expenses	$10,056.81	
Contractor fees	$20,113.63	
Start-up	$4,022.73	
Performance test	$7,500.00	
Total Indirect Cost	$61,806.80	
Total Capital Investment	**$323,283.95**	

Annual Costs			
Hours of operation	3,675		
.			
Direct Annual Costs			
Operating Labor	0.5 hrs/shift @ $18/hr	$	4,134.38
Supervisor 15% of operator		$	620.16
Operating Materials - Maintenance			
Labor 0.5 hr/shift $25/hr		$	6,843.75
Materials 100% of maintenance labor		$	6,843.75
Natural Gas	1.16 per therm	$	106,596.95
Electrcity	0.162/kwh	$	3,255.25
Total		**$**	**128,294.24**
Indirect Annual Cost			
Overhead 60% of sum of operating supervisor, & maintenance labor & maintenance materials		$	11,065.22
Administrative Charges 2% TCI - 9,650 17,800			$6,465.68
Property Taxes 1% TCI - 4,830 8,900			$3,232.84
Insurance 1% TCI - 4,830 122,700			$3,232.84
Capital recovery (7% over 10 years)			$46,035.63
Total IAC			**$70,032.21**
Total Annual Cost			**$198,326.45**
Precontrol Emissions			**9**
Controlled Emissions			**8.1**
Cost Effectiveness			**$24,484.75**

Attachment 3 – Plan Approval Application

CITY OF PHILADELPHIA

DEPARTMENT OF PUBLIC HEALTH
PUBLIC HEALTH SERVICES
AIR MANAGEMENT SERVICES

Air Management Services
321 University Avenue
Philadelphia PA 19104-4543
Phone: (215) 685-7572
FAX: (215) 685-7593

APPLICATION FOR PLAN APPROVAL TO CONSTRUCT, MODIFY OR REACTIVATE AN AIR CONTAMINATION SOURCE AND/OR AIR CLEANING DEVICE

(Prepare all information completely in print or type in triplicate)

SECTION A - APPLICATION INFORMATION

Location of source (Street Address) 3300 North Delaware Avenue, Philadelphia, PA 19134	Facility Name Philadelphia Terminal	
Owner Kinder Morgan Liquid Terminals, LLC		Tax ID No 76-056 1780
Mailing Address 3300 Nott h Delaware Avenue, Philadelphia, PA 19134	Telephone No. (215) 634-3031	Fax No. (215) 739-7999
Contact Person Alexander Turner	Title EHS Manager	
Mailing Address 3300 Nott h Delaware Avenue, Philadelphia, PA 19134	Telephone No. (215)634-3031	Fax No (215) 739-7999
E-mail Address Alexander_Turner@kindermorgan.com		

SECTION B - DESCRIPTION OF ACTIVITY

Application type ☐ New source ☐ Modification ☐ Replacement ☐ Reactivation ☐ Air cleaning device ☑ Other RACT Proposal	SIC Code 42226	Completion Date January 1, 2017
Applicable requirement ☐ NSPS ☐ NESHAP ☐ Case by Case MACT ☐ NSR ☐ PSD	Does Facility submit Compliance Review Form biannually? ☐ Yes ☑ No If No attach Air Pollution Control Act Compliance Review Form with this application.	

Source Description
Major Source VOC Facility

SECTION C - PERMIT COORDINATION (ONLY REQUIRED FOR LAND DEVELOPMENT)

Question	YES	NO
1. Will the project involve construction activity that disturbs five or more acres of land?	☐	☑
2. Will the project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system?	☐	☑
3. Will the project involve the construction and operation of industrial waste treatment facility?	☐	☑
4. Is onsite sewage disposal proposed for your project?	☐	☑
5. Will the project involve construction of sewage treatment facilities, sanitary sewer, or sewage pumping station?	☐	☑
6. Is a stormwater collection and discharge system proposed for this project?	☐	☑
7. Will any work associated with this project take place in or near a stream, waterway, or wetland?	☐	☑
8. Does the project involve dredging or construction of any dam, pier, bridge or outfall pipe?	☐	☑
9. Will any solid waste or liquid wastes be generated as a result of the project?	☐	☑
10. Is a State Park located within two miles from your project?	☐	☑

SECTION D - CERTIFICATION

I certify that I have the authority to submit this Permit Application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Signature _____ Date_____ Address 3300 Nott h Delaware Avenue, Philadelphia, PA 19134

Name & Title Rance Tollet, Terminal Manager Phone 215-634-3031 Fax 215-739-7999

SECTION E - OFFICIAL USE ONLY

Application No.	Plant ID	Health District	Census Tract	Fee	Date Received

Approved by	Date	Conformance by	Date

SECTION F 1 - GENERAL SOURCE INFORMATION

1. SOURCE | **2. NORMAL PROCESS OPERATING SCHEDULE**

	A. Type Source (Describe)	B. Manufacturer of Source	C. Model No.	D. Rated Capacity (Specify units)	E. Type of Materials Processed	A. Amount Processed/yr. (Specify units)	B. Average hr/day	C. Total hr/yr	D. % Throughput/Quarter			
									1st	2nd	3rd	4th
1	Uncontrolled Marine Vessel Loading Positions	N/A	N/A	1200 gpm	Organic/Inorganic Liquids	Varies	24	8760	25	25	25	25
2	Uncontrolled Tank Truck/Rail Car Loading Positions	N/A	N/A	450-1200 gpm	Organic/Inorganic Liquids	Varies	24	8760	25	25	25	25
3												
4												
5												

3. ESTIMATED FUEL USAGE (Specify Units) | 4. ANNUAL FUEL USAGE

A. Used in Unit	B. Type Fuel	C. Average Hourly Rate	D. Maximum Hourly Rate	E. Percent Sulfur	F. Percent Ash	G. Heating Value	A. Annual Amounts	B. Average hr/day	C. Total hr/yr	D. % Throughput/Quarter			
										1st	2nd	3rd	4th

5. IMPORTANT: **Attach on a separate sheet a flow diagram of process giving all (gaseous, liquid, and solid) flow rates . Also list raw materials charged to process equipment and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, hoods or other pickup points, etc.).**

SECTION F 1 - GENERAL SOURCE INFORMATION, CONTINUED

6. Describe process equipments in detail.

Kinder Morgan transfers various VOCs from the storage tanks into tank trucks, rail cars and marine vessels. VOCs are transfer by pumping through a network of dedicated piping from the tank to the truck rack position, rail car loading spot, or marine dock position. The tank trucks and rail cars are loaded at numerous rack positions throughout the facility. Any organic material with a reid vapor pressure of four or greater is controlled using a thermal oxidizer. Marine vessel emissions are uncontrolled except cumene vapors which are vented to a dedicated marine vapor combustor. The cumene vapors are controlled to ensure compliance with the Hazardous Air Pollutant emission limits imposed on the facility.

7. Describe fully the methods used to monitor and record all operating conditions that may affect the emission of air contaminants. Provide detailed information to show that these methods provided are adequate.

• Kinder Morgan shall monitor throughput of material processed and vapor pressures for all tanks, marine loading, and tank car/truck loading racks on a daily basis.
• For tank car/truck loading operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:
(1) Which rack is being used for loading;
(2) Which position at each rack is being used for loading;
(3) Whether the position being used for loading is controlled or uncontrolled;
(4) The name of material loaded per position;
(5) Throughputs of each material loaded per position;
(6) The corresponding vapor pressures of the material loaded per position;
(7) Emissions calculations per position on a monthly and rolling 12-month period.
• For marine vessel loading operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:
(1) The name of material loaded;
(2) Whether the loading is controlled or uncontrolled;
(3) Throughputs of each material loaded;
(4) The corresponding vapor pressures of the material loaded;
(5) Emission calculations on a monthly and rolling 12-month period;
(6) Marine loading gasoline and crude oil throughput records clen1onstrating co1npliance with Condition 2E on a monthly basis.

8. Describe modifications to process equipments in detail.

Not Applicable

9. Attach any and all additional information necessary to adequately describe the process equipment and to perform a thorough evaluation of the extent and nature of its emissions.

None

- Provide equipment information on this page if sources do not belong to special categories in F2 to F8, otherwise remove this page from this application.
- If there are more equipment, copy this page and fill in the information as indicated

SECTION G - FLUE AND AIR CONTAMINANT EMISSION INFORMATION

1. STACK AND EXHAUSTER

A. Outlet volume of exhaust gases
Varies _____ CFM @_____ °F _____ % Moisture

B, Exhauster (attach fan curves)
N/A _____ in w.g. _____ HP @ _____ RPM

C . Stack height above grade (ft) Varies
Grade elevation (ft) _____
Distance from discharge to nearest property line(ft) Varies

D Stack diameter (ft) or Outlet duct area (sq. ft.)
N/A

E Weather Cap
☐ YES ☑ NO

F. Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
N/A

2 POTENTIAL PROCESS EMISSIONS (OUTLET FROM PROCESS, BEFORE ANY CONTROL EQUIPMENT)

A. Particulate loading (lbs/hr or gr/DSCF)

B. Specific gravity of particulate (not bulk density)

C . Attached particle size distribution information

D. Specify gaseous contaminants and concentration

Contaminant		Concentration		VOC Contaminants		Concentration	
(1)	SO_x	N/A ppm (Vol.) _____ lbs/hr	(4)	Marine	Vaires	ppm (Vol.)	110 lbs/hr
(2)	NO_x	N/A ppm (Vol.) _____ lbs/hr	(5)	TT/TC	Varies	ppm (Vol.)	57 lbs/hr
(3)	CO	N/A ppm (Vol.) _____ lbs/hr	(6)	_____	_____	ppm (Vol.)	_____ lbs/hr

E. Does process vent through the control device ? ☐ YES ☑ NO

- If YES continue and fill out the appropriate SECTION H - CONTROL EQUIPMENT
- If NO skip to SECTION I - MISCELLANEOUS INFORMATION

F. Can the control equipment be bypassed: (If Yes, explain) ☐ YES ☑ NO

3. ATMOSPHERIC EMISSIONS

A. Particulate matter emissions (lbs/hr or gr/DSCF)
N/A

B. Gaseous contaminant emissions

See Attached Plan Approval for Proposed emissions limits

Contaminants		Concentration		VOC Contaminants		Concentration	
(1)	SO_X	N/A ppm (Vol.) _____ lbs/hr	(4)	Marine	_____	ppm (Vol.)	110 lbs/hr
(2)	NO_X	N/A ppm (Vol.) _____ lbs/h	(5)	TT/TC	_____	ppm (Vol.)	57 lbs/hr
(3)	CO	N/A ppm (Vol.) _____ lbs/h)	(6)	____ _____	_____	ppm (Vol.)	_____ lbs/hr

SECTION I - MISCELLANEOUS INFORMATION

1. Specify monitoring and recording devices will be used for monitoring and recording of the emission of air contaminants. Provide detailed information to show that the facilities provided are adequate. Include cost and maintenance information.

☐ Opacity monitoring system	☐ SOx monitoring system	☐ NOx monitoring system
☐ CO monitoring system	☐ CO_2 monitoring system	☐ Oxygen monitoring system
☐ HCL monitoring system	☐ TRS monitoring system	☐ H_2S monitoring system
☐ Temperature monitoring system	☐ Stack flow monitoring system	☐ Other _____

If checked, provide manufacturer's name, model no. and pertinent technical specifications.

2. Attach Air Pollution Episode Strategy (if applicable)

Not Applicable

3. If the source is subject to 25 Pa. Code Subchapter E, New Source Review requirements,

a. Demonstrate the availability of emission offset (if applicable)

Not Applicable

b. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs.

Not Applicable

4. Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III of the rules and regulations of Philadelphia Air Management, Pennsylvania Department of Environmental Protection and those requirements promulgated by the Administrator of the United States Environmental Protection Agency pursuant to the provisions of the Clean Air Act.

Not Applicable

5. List all attachments included in this Application.

Not Applicable

PLID 05003

CITY OF PHILADELPHIA

DEPARTMENT OF PUBLIC HEALTH
Donald F. Schwarz, MD, MPH
Deputy Mayor for Health & Opportunity
Health Commissioner

Nan Feyler, JD, MPH
Chief of Staff

Air Management Services
Thomas Huynh
Director

Source Registration
321 University Avenue, 2nd Floor
Philadelphia, PA 19104

Telephone (215) 685-7572
Fax (215) 685-7593

March 22, 2016

Mr. Thomas Stafiniak
Kinder Morgan Liquid Terminals. LLC
3300 North Delaware Avenue
Philadelphia, PA 19134

PLID: 05003

RE: RACT Plan Approval

Dear Mr. Stafiniak,

Enclosed is the latest RACT plan approval for your facility. It has been issued. Pursuant to § 5-1005 of the Philadelphia Home Rule Charter, an administrative appeal of this License may be filed with the Board of Licenses and Inspections Review (BLIR). Any such appeal should be filed within thirty (30) days, include a copy of this RACT plan approval and be directed to:

Board of License and Inspection Review
Municipal Services Building, 11th Floor
1401 JFK Blvd.
Philadelphia, PA 19102

If you have any questions, please contact me at (215) 685-9426 or edward.wiener@phila.gov .

Sincerely,

Edward Wiener
Environmental Engineer

032216609

CITY OF PHILADELPHIA
DEPARTMENT OF PUBLIC HEALTH
AIR MANAGEMENT SERVICES

RACT PLAN APPROVAL

Effective Date: February 9, 2016

Expiration Date: None

Replaces Permit No.: PA-5003 effective on May 29, 1995

In accordance with provisions of the Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, and after due consideration of a Reasonably Available Control Technology (RACT) proposal received under the Pennsylvania Code, Title 25, Chapter 129.91 thru 129.95, of the rules and regulations of the Pennsylvania Department of Environmental Protection (PADEP), Air Management Services (AMS) approved the RACT proposal of the Facility below for the source(s) listed in section 1.A. Emission Sources of the attached RACT Plan Approval.

Facility:	Kinder Morgan Liquid Terminals, LLC
Owner:	Kinder Morgan Liquid Terminals, LLC
Location:	3300 North Delaware Ave., Philadelphia, PA 19134
Mailing Address:	3300 North Delaware Ave., Philadelphia, PA 19134
SIC Code(s):	4226
Plant ID:	05003
Facility Contact:	Tom Stafiniak
Phone:	(215) 634-3031
Permit Contact:	Tom Stafiniak
Phone:	(215) 634-3031
Responsible Official:	Rance Tollett
Title:	Terminal Manager

2/9/2016

Edward Wiener, Chief of Source Registration **Date**

The RACT plan approval is subject to the following conditions:

1. The purpose of this Plan Approval is to establish Volatile Organic Compound (VOC) Reasonably Available Control Technology (RACT) for Kinder Morgan Liquid Terminals, LLC. This includes the following emission sources and control equipment:

   A. Emission Sources:

      1. Controlled tank car/truck loading rack positions. Each controlled rack loading position is connected to the NAO Thermal Oxidation Unit.

      2. Uncontrolled tank car /truck loading positions. Each uncontrolled rack loading position is not connected to a a control device.

      3. Marine vessel loading operations, two loading berths.

      4. Fugitive emissions.

   B. Control Equipment:

      1. NAO Thermal Oxidation Unit-This unit is associated with controlled tank car/truck loading positions. This unit captures VOC emissions from controlled car/truck loading positions.

      2. Marine Vapor Combustion Unit. This unit captures vapors from cumene loading at the marine vessel loading operations.

2. This approval authorizes:

   A. Volatile Organic Compounds (VOC) liquids with a Reid Vapor Pressure (RVP) greater than or equal to 4.0 pounds per square inch (psi) shall only be loaded into tank car/truck loading positions connected to the NAO Thermal Oxidation Unit complying with 0.0668 pounds (30.3 grams) of organic liquids (measured as propane) are emitted to the atmosphere for every 100 gallons (380 liters) of liquids loaded. [25 Pa Code 129.59]

   B. Each uncontrolled tank car/truck loading position shall be limited to processing organic liquid with an RVP less than 4.0 pounds per square inch (psi).

   C. Marine vessel loading operations shall not process petroleum distillate with a vapor pressure of 4.0 RVP or greater.

3. Emission Limitations

   A. Controlled tank car/truck loading positions at the facility shall comply with the following:

      1. The total combined VOC emissions from all controlled tank car/truck loading rack positions at the facility shall be less than 57.0 pounds per hour.

   B. Loading operations at "uncontrolled tank car/truck loading positions" shall comply with the following:

      1. Total combined emissions from all "uncontrolled tank car/truck loading positions" at the facility combined shall be limited to 129 tons of VOC per 12 month rolling period;

      2. Emissions from each " uncontrolled tank car/truck loading position" shall not exceed 9.0 tons of VOC per 12 month rolling period;

      3. Emissions from each "uncontrolled tank car/truck loading position" shall not exceed 18.1 pounds of VOC per hour.

   C. Marine loading operations at the facility shall comply with the following:

1. Marine vessel loading operations shall not exceed 51 tons of VOC per 12 month rolling period;

D. Fugitive emissions shall comply with the requirements of AMR V Section XIII.

4. Testing Requirements

A. Kinder Morgan shall conduct stack testing per AMS approved protocol on the NAO Thermal Oxidation Unit at least every five (5) years.

1. Initial testing must commence no later than 18 months following the effective date of this plan approval.

B. Kinder Morgan shall conduct stack testing per AMS approved protocol on the Marine Vapor Combustion Unit at least every five (5) years.

1. Initial testing must commence no later than August 30, 2017 (five years after the initial stack test) .

5. Monitoring Requirements

A. Kinder Morgan shall monitor throughput of material processed and vapor pressures for all tanks, marine loading, and tank car/truck loading racks on a daily basis.

6. Recordkeeping and Reporting Requirements

A. For controlled and uncontrolled loading tank car/truck operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:

1. Which rack is being used for loading;

2. Which position at each rack is being used for loading;

3. Whether the position being used for loading is controlled or uncontrolled;

4. The name of material loaded per position;

5. Throughputs of each material loaded per position;

6. The corresponding vapor pressures of the material loaded per position;

7. Emissions calculations from all controlled loading rack positions to demonstrate compliance with the lb/hour limit of Condition 3.A.1

8. Emissions calculations from all uncontrolled loading rack positions on a monthly and rolling 12 month period to demonstrate compliance with Condition 3.B.1

9. Emissions calculations per uncontrolled loading rack position on an hourly, monthly, and rolling 12-month period to demonstrate compliance with Conditions 3.B.2 and 3.B.3

B. For marine vessel loading operations, Kinder Morgan Liquid Terminals, LLC shall keep records of the following:

1. The name of material loaded;

2. Whether the loading is controlled or uncontrolled;

3. Throughputs of each material loaded;

4. True vapor pressures and verification that the material loaded has a RVP of less than 4.0;

5. Emission calculations on a monthly and rolling 12-month period to demonstrate compliance with Conditions 3.C.1.

C. Kinder Morgan Liquid Terminals, LLC shall monitor and maintain a file containing all the records and other data that are required to be collected to demonstrate compliance with VOC RACT requirements.

D. The records shall provide sufficient data and calculations to clearly demonstrate that the VOC RACT requirements are met.

E. Data of information required to determine compliance shall be recorded and maintained in a time frame consistent with the averaging period of the requirement.

F. Records shall be kept for at least five (5) years and shall be made available to AMS on request.

7. RACT Implementation Schedule

A. Upon issuance of this approval, Kinder Morgan Liquid Terminals, LLC shall begin immediate implementation of the measures necessary to comply with the approved RACT plan approval.

8. Revisions to any emission limitations incorporated in this RACT Approval will require resubmission as revision to the PA State Implementation Plan. The applicant shall bear the cost of public hearing and notification required for EPA approval as stipulated in 25 PA Code SS129.91(h).