

**ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM**

January 14, 2003

SUBJECT: Review of Application
Title V Operating Permit
Buckeye Pipeline Co., L.P.
520 Narrows Run Road
Moon Township, PA 15108

RE: Operating Permit File No. 0040
Bulk petroleum distribution terminal

TO: Sandra L. Etzel
Manager Engineering

FROM: Timothy J. Novack, P.E.

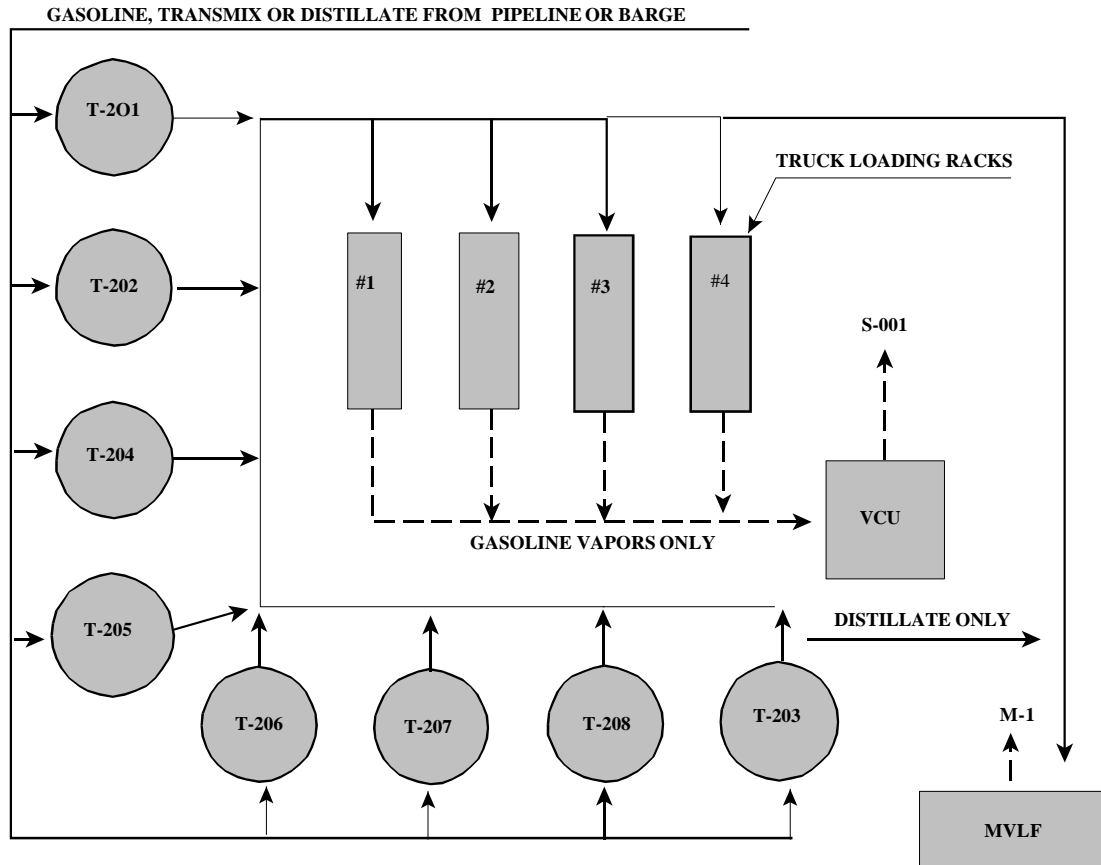
FACILITY DESCRIPTION:

Buckeye Pipeline Co., L.P., Moon Township Terminal is an aboveground bulk material storage tank distribution and pipeline breakout facility for petroleum products, with allowable facility throughput limitations for facility rack loading of 250,000,000 gallons/yr of gasoline, and 250,000,000 gallons/yr of distillate products. The terminal receives bulk petroleum products, such as gasoline and distillate oil from their distribution pipeline or by barge and stores them in one of eight aboveground storage tanks (ASTs). Petroleum liquids and distillate products are transferred from these ASTs, upon demand, via pipelines to the terminal's tank truck loading racks (TLR) and vapor combustion unit (VCU) for loading of tanker trucks. Distillate products may also be loaded onto barges at the terminal's marine vessel loading facility (MVLV), up to a maximum of 50,000,000 gallons/yr. The facility is a major source of volatile organic compounds (VOCs) and a minor source of total particulate matter (PM), particulate matter < 10 microns in dia. (PM-10), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO) and hazardous air pollutants (HAPs) as defined in section 2101.20 of Article XXI.

The facility presently consists of the following emission units:

1. Loading racks of 4 bays with 17 multiple loading arms and one VCU.
2. Seven vertical internal floating roof ASTs ranging in size from 105,000 gallons to 4,620,000 gallons, four dedicated to gasoline storage and three dedicated to distillate storage. All gasoline tanks may store distillate as required by the facility.
3. One 4,620,000 gallon vertical, fixed roof AST for distillate storage
4. Six horizontal aboveground product additive storage tanks ranging in size from 275 gallons to 10,000 gallons.
5. One underground sump at 550 gallons.
6. One MVLV for distillate barge loading only.

Facility Process Diagram:



Storage Tank Data:

Tank I.D	Capacity (gal.)	Year built	Type	Controls	Normal storage
T-201	2,100,000	1977	Vertical above ground	Internal floating roof with liquid seal	Distillate @ ambient temperature
T-202	4,620,000	1977/95	Vertical above ground	Internal floating roof with liquid seal	Gasoline @ ambient temperature
T-203	4,620,000	1978	Vertical above ground	Pressure relief valves	Distillate @ ambient temperature
T-204	2,100,000	1978/95	Vertical above ground	Internal floating roof with liquid seal	Distillate @ ambient temperature
T-205	2,100,000	1978/95	Vertical above ground	Internal floating roof with liquid seal	Gasoline @ ambient temperature
T-206	4,620,000	1995	Vertical above ground	Internal floating roof with liquid seal	Gasoline @ ambient temperature
T-207	2,100,000	1995	Vertical above ground	Internal floating roof with mechanical shoe seal	Gasoline @ ambient temperature
T-208	105,000	1983	Vertical above ground	Internal floating roof with mechanical shoe seal	Distillate @ ambient temperature

FSII	10,000	1995	Horizontal above ground	None	JP-8 de-icer @ ambient
Stadis 450	275	1995	Horizontal above ground	None	Anti-static @ ambient
OGA 591	8,000	1995	Horizontal above ground	None	Additive @ ambient
T-240	224 bbl	1995	Horizontal above ground	None	Emergency relief @ ambient
T-223	8,000	2001	Horizontal above ground	None	Additive @ ambient
T-224	2,000	2001	Horizontal above ground	None	Red dye @ ambient

Loading Rack Data:

Maximum throughput: 105,000gal/hr gasoline and/or distillate
 No. of bays: Four
 No. of arms: Fifteen
 Arms/bay: Bay no.1- distillate, bay no.2 - three gasoline and four distillate, bay no.3 - three gasoline and three distillate, bay no.4 - three gasoline
 Controls: Vapor combustion unit (flare)

Vapor Recovery unit Data:

Make: John Zink, Co.
 Model: VC-ZTOF
 Design throughput: 5,800 gal/min
 Year installed: 1975
 Type: Vapor combustion unit (flair), enclosed, natural draft, air assisted, temperature controlled.
 Estimated Eff: 98%+
 Pilot: 21 scfh propane @ 4 psig or 54 scfh natural gas @ 7 psig, per pilot
 Max vapor flow: 642 scfm
 Estimated control eff: 98%+
 Capture efficiency: 98.47%
 Design outlet conc. 35 mg/l
 Instrumentation: John Zink Co., programmable logic controller

Fugitive emission sources:

Paved roads: Approximately 0.1 mile.
 Unpaved roads: Approximately 0.2 miles.
 Paved parking: Approximately 1,250 ft²

EMISSION SOURCES OF MINOR SIGNIFICANCE:

1. Paved and unpaved areas are a source of minor significance with negligible emissions of PM and PM-10 as per US EPA, AP-42, Section 13.2.1, Paved Roads, 10-97 & Section 13.2.2, Unpaved Roads, 9-98.
2. The six aboveground horizontal ASTs, ranging in size from 275 gallons to 10,000 gallons for additives have negligible emissions of VOCs and HAPs due to low vapor pressure.

3. The horizontal underground sump tank at 550 gallons has negligible emissions of VOCs and HAPs due to their underground placement, size and low vapor pressure.
5. The one emergency relief tank has no emissions of VOCs and HAPs under normal operations.
6. The one MVLF for distillate barge loading at a maximum throughput of 50,000,000 gal/yr has negligible emissions of VOCs and HAPs due to low vapor pressure of distillates.
8. Fugitive VOCs and HAPs from valves, pumps and flanges are negligible

MAXIMUM POTENTIAL EMISSIONS SUMMARY:

Pollutant	Loading Racks & VCU	Tanks Storage	Total
	tons/yr	tons/yr	tons/yr
VOCs	23.7	61.21	84.91
Total HAPs	3.00	7.33	10.33

A year is defined as any consecutive twelve month period

EMISSION CALCULATIONS:

Loading rack potential emissions:

Gasoline & Distillate VOC emissions:

1. The maximum allowable throughput for the loading racks is 250,000,000 gallons of gasoline and 250,000,000 of distillate in any consecutive 12 month period. The maximum short term loading rates for the racks is 105,000 gal/hr, being limited by the capacity of the racks.
2. The maximum allowable VOC emissions from the VRU are 12 mg/l as specified in Operating Permit 0065517-000-40101, dated May 9, 1995.
3. The estimated maximum fugitive emissions from the tanker trucks during gasoline loading is 9 mg/l calculated using 0.5% as the average leakage from a truck passing the 3-inch pressure decay test (USEPA, 1980: Bulk Gasoline Terminals - Background Information for Proposed Standards, Table C-4).

4. Maximum potential annual VOC emissions from gasoline truck loading:

$$250 \times 10^6 \text{ gal/yr} \times (12 \text{ mg/l} + 9 \text{ mg/l}) \times 8.346 \times 10^{-6} \text{ lb-l/mg-gal} = 43,816.5 \text{ lbs/yr} = \mathbf{21.91 \text{ tons/yr}}$$

$$250 \times 10^6 \text{ gal/yr} \times 12 \text{ mg/l} \times 8.346 \times 10^{-6} \text{ lb-l/mg-gal} = 25,038 \text{ lbs/yr} = \mathbf{12.52 \text{ tons/yr -VCU only}}$$

5. Maximum potential hourly VOC emissions from gasoline truck loading:

$$105,000 \text{ gal/hr} \times (12 \text{ mg/l} + 9 \text{ mg/l}) \times 8.346 \times 10^{-6} \text{ lb-l/mg-gal} = \mathbf{18.40 \text{ lbs/hr}}$$

$$105,000 \text{ gal/hr} \times 12 \text{ mg/l} \times 8.346 \times 10^{-6} \text{ lb-l/mg-gal} = \mathbf{10.52 \text{ lbs/hr-VCU only}}$$

6. Maximum potential annual VOC emissions from distillate truck loading:

$$12.46 \times [(1.0 \times 0.0045 \text{ psi} \times 130 \text{ lb/lb-mole}) / (510^{\circ}\text{R})] = 0.0142 \text{ lbs/1000 gal}$$

$$0.0143 \times (250,000,000 \text{ gal} / 1000 \text{ gal}) = \mathbf{1.79 \text{ tons/yr}}$$

7. Maximum potential hourly VOC emissions from distillate truck loading:

$$0.0142 \times (105,000 / 1000 \text{ gal}) = \mathbf{1.49 \text{ lbs/hr}}$$

Hap emissions:

1. The vapor weight fraction for each HAP in gasoline and distillate presented below were applied to the total VOC tpy and lbs/hr calculated above to calculate HAP emissions.

HAP	Vapor wt. Fraction %		Lbs/hr			Tons/yr		
	Gasoline	Distillate	Gasoline VRU Only	Gasoline Leakage	Distillate	Gasoline VRU Only	Gasoline Leakage	Distillate
VOCs	100.00	100.00	10.52	7.88	1.49	12.52	9.39	1.79
2,2,4-Trimethylpentane	0.953	0.327	0.10	0.08	0.005	0.12	0.09	0.006
Benzene	0.625	2.149	0.06	0.05	0.032	0.08	0.06	0.039
Biphenyl	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cresol	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cumene	0.015	0.194	0.00	0.00	0.003	0.00	0.00	0.004
Ethylbenzene	0.063	0.891	0.01	0.01	0.013	0.01	0.01	0.016
Hexane	4.427	22.822	0.46	0.35	0.340	0.53	0.42	0.408
MTBE	3.619	0.000	0.38	0.29	0.000	0.45	0.34	0.000
Naphthalene	<0.001	0.079	<0.001	<0.001	0.001	<0.001	<0.001	0.001
Phenol	<0.001	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Styrene	0.088	0.000	0.01	0.01	0.000	0.01	0.01	0.000
Toluene	0.842	6.003	0.09	0.07	0.089	0.11	0.08	0.107
Xylenes	0.235	2.910	0.02	0.02	0.044	0.03	0.02	0.052
Total HAPs	10.867	35.393	1.13	0.88	0.527	1.34	1.03	0.633

Gasoline, distillate & additive tanks potential emissions:

1. VOC emissions were calculated using the US EPA TANKS 4.0 program. HAP emissions were calculated by applying the vapor weight percent of each HAP to the total VOCs from each tank. RVP values change during the year and have been entered into the tanks program on a monthly basis. See Tanks 4.0 runs in operating permit application 0066.

2. Tank data and emissions:

Tank no.	Size	Max Turnovers	Contents	VOCs tons/yr
T-201	2,100,000 gal	86.3	distillate	0.28
T-202	4,620,000 gal	86.3	gasoline	4.38
T-203	4,620,000 gal	86.3	distillate	2.27
T-204	2,100,000 gal	86.3	distillate	0.28
T-205	2,100,000 gal	86.3	gasoline	2.23
T-206	4,620,000 gal	86.3	gasoline	4.39
T-207	2,100,000 gal	86.3	gasoline	2.17
T-208	105,000 gal	200.0	distillate	0.08
Total				16.246

3. Tank landing emissions: The facility is a consumer provider of gasoline and distillate products which are ordered in batch quantities. After every batch is processed through the facility the storage tank(s) must be landed to retrieve all of the customers product before receiving a new batch. See operating permit application 0066 for calculations for emissions. The number of tank landings per tank in the referenced application has been lowered to 15 for T-206, 90 for T-205 and 20 for T-202.

Tank	Gasoline tpy	Distillate tpy
T-201	----	0.10
T-202	11.13	----
T-204	----	0.14
T-205	22.16	----
T-206	8.01	----
T-207	2.58	----
T-208	----	0.01
Total	43.88	0.25

Haps from working & breathing losses (tons/yr)

HAP	Vapor wt. Fraction %		T-201	T-202	T-203	T-204	T-205	T-206	T-207	T-208	Total
	Gasoline	Distillate	Distillate	Gasoline	Distillate	Distillate	Gasoline	Gasoline	Gasoline	Distillate	
VOCs	100.00	100.00	0.28	4.38	2.27	0.28	2.23	4.39	2.17	0.08	16.08
2,2,4-Trimethylpentane	0.953	0.327	0.001	0.042	0.007	0.001	0.021	0.042	0.021	0.000	0.134
Benzene	0.625	2.149	0.006	0.027	0.049	0.006	0.014	0.027	0.014	0.002	0.145
Biphenyl	<0.001	<0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cresol	<0.001	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cumene	0.015	0.194	0.001	0.001	0.004	0.001	0.000	0.000	0.000	0.000	0.007
Ethylbenzene	0.063	0.891	0.002	0.003	0.020	0.002	0.001	0.003	0.001	0.001	0.034
Hexane	4.427	22.822	0.064	0.194	0.518	0.064	0.099	0.194	0.096	0.018	1.247
MTBE	3.619	0.000	0.000	0.158	0.000	0.000	0.081	0.159	0.078	0.000	0.476
Naphthalene	<0.001	0.079	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002
Phenol	<0.001	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Styrene	0.088	0.000	0.000	0.004	0.000	0.000	0.002	0.004	0.002	0.000	0.012
Toluene	0.842	6.003	0.017	0.037	0.136	0.017	0.019	0.037	0.018	0.005	0.286
Xylenes	0.235	2.910	0.008	0.010	0.066	0.008	0.005	0.010	0.005	0.002	0.114
Total HAPs	10.867	35.393	0.10	0.48	0.80	0.10	0.24	0.48	0.24	0.03	2.47

Haps from tank landing losses (tons/yr)

HAP	Vapor wt. Fraction %		T-201	T-202	T-203	T-204	T-205	T-206	T-207	T-208	Total
	Gasoline	Distillate	Distillate	Gasoline	Distillate	Distillate	Gasoline	Gasoline	Gasoline	Distillate	
VOCs	100.00	100.00	0.10	11.13	0.00	0.14	22.16	8.01	2.58	0.01	44.13
2,2,4-Trimethylpentane	0.953	0.327	0.000	0.106	0.000	0.001	0.211	0.076	0.025	0.000	0.419
Benzene	0.625	2.149	0.002	0.069	0.000	0.003	0.138	0.050	0.016	0.000	0.278
Biphenyl	<0.001	<0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cresol	<0.001	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cumene	0.015	0.194	0.000	0.002	0.000	0.000	0.003	0.001	0.000	0.000	0.006
Ethylbenzene	0.063	0.891	0.001	0.009	0.000	0.001	0.014	0.005	0.002	0.000	0.032
Hexane	4.427	22.822	0.023	0.493	0.000	0.032	0.981	0.355	0.114	0.002	2.000
MTBE	3.619	0.000	0.000	0.403	0.000	0.000	0.802	0.290	0.093	0.000	1.588
Naphthalene	<0.001	0.079	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Phenol	<0.001	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Styrene	0.088	0.000	0.000	0.010	0.000	0.000	0.019	0.007	0.002	0.000	0.038
Toluene	0.842	6.003	0.006	0.094	0.000	0.008	0.187	0.067	0.022	0.001	0.385
Xylenes	0.235	2.910	0.003	0.026	0.000	0.004	0.052	0.019	0.006	0.000	0.110
Total HAPs	10.867	35.393	0.04	1.21	0.000	0.049	2.41	0.87	0.28	0.003	4.86

OPERATING PERMIT APPLICATION COMPONENTS:

1. Updated Operating Permit Application No. 0066, dated September 14, 2000

TESTING REQUIREMENTS:

The permittee shall test the loading process and VCU for compliance with the requirements of this permit, Section 60.503 of 40 CFR 60, subpart XX and section 2105.13 of Article XXI, every five years or after a modification to the loading racks or VCU. Testing shall be conducted according to the procedures of Section 60.503 of 40 CFR 60, subpart XX and section 2105.13 of Article XXI and shall follow the requirements of section 2108.02 of Article XXI.

APPLICABLE REQUIREMENTS:

Article XXI, Requirements for Issuance:

The requirements of Article XXI, Parts B and C for the issuance of major operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

40 CFR PART 64, Compliance Assurance Monitoring:

The requirements of 40 CFR Part 64, Compliance Assurance Monitoring, were found to be applicable to this facility and will be implemented and incorporated into this permit upon the first renewal.

40 CFR PART 60, subpart K, Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978:

No storage tanks at this facility are subject to this standard due to the age of the tanks, age of any modifications or sizes.

40 CFR PART 60, subpart Ka, Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 11, 1978, and Prior to July 23, 1984:

No storage tanks at this facility are subject to this standard due to the age of the tanks, age of any modifications or sizes.

40 CFR PART 60, subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984:

Tanks T-202, T-205, T-206 and T-207 are subject to this subpart when in gasoline or transmix service. Tanks T-201, T-203, T-204 and T-208 are subject to record keeping requirements only, due to low vapor pressure of distillate material. See the Operating Permit No. 0066 for specific regulatory provisions.

40 CFR 60, Subpart XX, Standards of Performance for Bulk Gasoline Terminals:

The total of all gasoline loading racks at the facility are affected units under subpart XX. See the Operating Permit No. 0066 for specific regulatory provisions.

Article XXI, 2105.13 Gasoline Loading Facilities:

This section is applicable to the facility. See the Operating Permit No. 0066 for specific regulatory provisions.

METHOD OF COMPLIANCE DETERMINATION:

Compliance with the emission standards set in this permit will be demonstrated by compliance with the above applicable regulations, testing of the VCU and loading racks every five years, monitoring of the proper operation of the flame indicator and no visible emissions from the unit on a daily basis, along with record keeping and reporting requirements. See the Operating Permit No. 0066 for specific compliance methods, record keeping and reporting requirements for the facility.

RECOMMENDATIONS:

The facility is in compliance with all applicable regulations of Article XXI and it is recommended that the Operating Permit No. 0040 be issued.