Certified Mail 9059 7431

December 4, 2002

Julius M. Blanco
Marathon Ashland Petroleum, LLC
1304 Olin Avenue
Indianapolis, IN 46222-3294

Re: 089-16717-00231
First Minor Source Modification to:
Part 70 permit No.: T089-7400-00231

Dear Mr. Blanco:

Marathon Ashland Petroleum, LLC was issued Part 70 operating permit T089-7400-00231 on December 30, 1997 for a Bulk Petroleum Storage and Terminal. An application to modify the source was received on October 25, 2002. Pursuant to 326 IAC 2-7-10.5 the following emission unit is approved for construction at the source:

Addition of an internal floating roof with mechanical shoe seal to existing fixed cone storage tank 55-3.

The following construction conditions are applicable to the proposed project:

General Construction Conditions

1. The data and information supplied with the application shall be considered part of this source modification approval. Prior to any proposed change in construction which may affect the potential to emit (PTE) of the proposed project, the change must be approved by the Office of Air Quality (OAQ).

2. This approval to construct does not relieve the permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

3. Effective Date of the Permit
Pursuant to IC 13-15-5-3, this approval becomes effective upon its issuance.

4. Pursuant to 326 IAC 2-1.1-9 and 326 IAC 2-7-10.5(i), the Commissioner may revoke this approval if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

5. All requirements and conditions of this construction approval shall remain in effect unless modified in a manner consistent with procedures established pursuant to 326 IAC 2.

6. Pursuant to 326 IAC 2-7-10.5(l) the emission units constructed under this approval shall not be placed into operation prior to revision of the source's Part 70 Operating Permit to incorporate the required operation conditions.

The proposed operating conditions applicable to this emission unit are attached to this minor source modification approval. These proposed operating conditions shall be incorporated into the Part 70 operating permit as a significant permit modification in accordance with 326 IAC 2-7-12.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter call (219) 853-6306 and ask for Ronald Holder.

Sincerely,

Ronald L. Novak, Director
Hammond Department of Environmental Management
Air Pollution Control Division

Attachments
RH
cc: IDEM-OAQ – Permits Administration – Mindy Hahn

PART 70 MINOR SOURCE MODIFICATION

Indiana Department of Environmental Management
Office of Air Quality

and

Hammond Department of Environmental Management
Air Pollution Control Division

Marathon Ashland Petroleum, LLC
4206 Columbia Avenue
Hammond, Indiana 46327

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission unit described in Section A (Source Summary) of this approval.

This approval is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Minor Source Modification No.: 089-16717-00231	
Issued by:	Issuance Date: December 4, 2002
Ronald L. Novak, Director Hammond Department of Environmental Management	

TABLE OF CONTENTS

SECTION A SOURCE SUMMARY

This approval is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) and the Hammond Department of Environmental Management (HDEM). The information describing the emission units contained in conditions A.1 through A.2 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this approval pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a stationary Bulk Petroleum Storage and Terminal.

Responsible Official:	Noel R. Garza, Manager, Terminal, Transport, & Marine
Source Address:	4206 Columbia Avenue, Hammond, Indiana 46327
Mailing Address:	539 South Main Street, Findlay, OH 45840
SIC Code:	5171 – Petroleum Bulk Stations & Terminals
County Location:	Lake
County Status:	Attainment for Lead, CO and NO_2, and Non-Attainment for all other criteria pollutants including ozone
Source Status:	Part 70 Permit Program Major Source, under Emission Offset Rules

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

This stationary source is approved to construct and operate the following emission units and pollution control devices:

One (1) Petroleum Liquid Storage Tank, identified as Tank 55-3 with the following specifications:

Tank 55-3 has an internal floating roof equipped with a mechanical shoe seal for the storage of gasoline or less volatile petroleum products. The maximum design capacity of the tank is 2,154,894 gallons.

A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

This modification does not include any insignificant activities, as defined in 326 IAC 2-7-1(21).

A.4 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because it is a major source, as defined in 326 IAC 2-7-1(22).

SECTION D.1 FACILITY OPERATION CONDITIONS

One (1) Petroleum Liquid Storage Tank, identified as Tank 55-3 with the following specifications:

Tank 55-3 has an internal floating roof equipped with a mechanical shoe seal for the storage of gasoline or less volatile petroleum products. The maximum design capacity of the tank is 2,154,894 gallons.

Emission Limitations and Standards [326 IA C 2-7-5(1)]

D.1.1 Volatile Organic Compounds (VOC)

This internal floating roof storage vessel shall comply with the standards outlined in 326 IAC 12, 40 CFR 60.112b(a)(1) and 326 IAC 8-4-3(b).

D.1.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan is required for this facility and any control devices.

Compliance Determination Requirements

D.1.3 Monitoring - Testing and Procedures Equipment (Visual Inspection, Repair, and Notification)

(a) The internal floating roof storage vessel shall comply with the following testing and procedures requirements (visual inspections, repairs, notifications) of 326 IAC 12, 40 CFR 60.113b.

(b) Pursuant to 326 IAC 12, 40 CFR 60.113b, a visual inspection should be made of the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the vessel with VOL. For storage vessels equipped with a liquid-mounted or mechanical shoe primary seal, visual inspections should be performed annually. For vessels equipped with both primary and secondary seals, a visual inspection should be performed at least every five (5) years.

(c) Pursuant to 326 IAC 12, 40 CFR 60.115b(a)(3), if during the required annual visual inspection, the internal floating roof is not resting on the surface of the VOL, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric, the owner or operator shall repair the items or empty and remove the vessel from service within forty-five (45) days. Records of such incidents shall be maintained and a report shall be furnished to the department within thirty (30) days of the inspection. The report shall identify the following:

1) The vessel by identification number

2) The nature of the defects

3) The date the vessel was emptied or the nature of and date the repair was made.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.1.4 There are no compliance monitoring requirements for this facility.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.5 Record Keeping and Reporting Requirements (Tank Inspections)

(a) The internal floating roof storage vessel shall comply with the following record keeping and reporting requirements as outlined in 326 IAC 12, 40 CFR 60.115b(a)(2).

(b) Pursuant to 326 IAC 12, 40 CFR 60.115b(a)(2), a record of each inspection performed shall be maintained and shall identify the following:

1) The vessel inspected by identification number.

2) The date the vessel was inspected.

3) The observed condition of each component of the control equipment, including the following: seals, internal floating roof, and fittings.

D.1.6 Record Keeping and Reporting Requirements (Product Storage)

(a) The internal floating roof storage vessel shall comply with the following record keeping and reporting requirements as outlined in 326 IAC 12, 40 CFR 60.116b(c), Subpart Kb and 326 IAC 8-4-3(d).

(b) Pursuant to 326 IAC 12, 40 CFR 60.116b(c), Subpart Kb and 326 IAC 8-4-3(d), records of the petroleum liquid stored, the period of storage and the maximum true vapor pressure of that liquid as stored during the respective storage period shall be maintained for a minimum period of two (2) years and made available upon request by IDEM-OAM or HDEM.

D.1.7 Reporting Requirements

A report of any defects (the internal floating roof not resting on the surface of the VOL, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric) discovered shall be furnished to the department within thirty (30) days of the inspection. The report shall identify the vessel identification number, the nature of the defects, and the date the vessel was emptied or the nature of and date the repair was made.

Indiana Department of Environmental Management
Office of Air Quality

and

Hammond Department of Environmental Management
Air Pollution Control Division

Technical Support Document (TSD) for a Part 70
Minor Source Modification and Significant Permit Modification

Source Background and Description

Source Name:	**Marathon Ashland Petroleum, LLC**
Source Location:	4206 Columbia Avenue, Hammond, IN 46327-1487
County:	Lake
SIC Code:	5171 – Bulk Petroleum Storage and Terminal
Operation Permit No.:	**T089-7400-00231**
Operation Permit Issuance Date:	December 30, 1997
Minor Source Modification	**089-16717-00231**
Significant Permit Modification	**089-16719-00231**
Permit Reviewer:	Ronald Holder - HDEM

The Office of Air Quality (OAQ) has reviewed a minor source modification application from Marathon Ashland Petroleum, LLC, relating to the addition of an internal floating roof to an existing fixed cone storage tank identified as Tank 55-3.

History

On October 25, 2002, Marathon Ashland Petroleum, LLC submitted an application to the OAQ requesting to add an internal floating roof to storage tank 55-3 at their terminal in Hammond, Indiana. Marathon was issued a Part 70 permit (T089-7400-00231) on December 30, 1997.

Existing Approvals

The source was issued a Part 70 Operating Permit (T089-7400-00231) on December 30, 1997. The source has since received the following:

(a) First Administrative Amendment (089-9324-00231), issued on March 23, 1998;

(b) Second Administrative Amendment (089-11140-00231), issued on July 20, 1999;

(c) Third Administrative Amendment (089-13941-00231), issued on March 5, 2001; and

(d) Fourth Administrative Amendment (089-14613-00231), issued on August 17, 2001.

Enforcement Issue

There are no enforcement actions pending.

Stack (Tank) Summary (before and after the addition of the internal floating roof)

Stack (Tank) ID	Operation (Storage of)	Tank Height (feet)	Tank Diameter (feet)	Internal Floating Roof and Seal	Capacity (gallons)
55-3 (FCR)	Fuel Oil #2	48'	90'	none	2,242,212
55-3 (IF)	Gasoline	48'	90'	Mechanical Shoe	2,154,894
				Primary Seal	

Recommendation

The staff recommends to the Commissioner that a Minor Source Modification and Significant Permit Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on October 25, 2002.

Emission Calculations

See Appendix A of this document for detailed emissions calculations (two (2) pages). These calculations confirm the accuracy of the calculations submitted by the applicant.

Potential To Emit of Modification

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA."

This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Increase in Potential To Emit of Fixed Cone Roof Tank 55-3 due to the installation of Internal Float Pan and Mechanical Shoe Seal. Gasoline cannot be stored in a storage tank greater than 39, 000 gallons capacity unless there is an internal floating roof.

Pollutant	Potential To Emit (tons/year)
PM	0
PM-10	0
SO_2	0
VOC	4.25
CO	0
NO_x	0

HAPs	Potential To Emit (tons/year)
Total Combination of HAPs in gasoline (approximately 15%)	0.64

Justification for Modification

The Part 70 Operating permit is being modified through a Part 70 Minor Source Modification and Significant Permit Modification. The minor source modification is being performed pursuant to 326 IAC 2-7-10.5(d)(6); a modification that is subject to a new source performance standard (NSPS) and the source has acknowledged the requirement to comply with the NSPS; and 326 IAC 2-7-10.5(d)(10); for a source in Lake County with the potential to emit twenty-five (25) ton per year of VOC, any modification that would result in an increase greater than or equal to fifteen (15) pounds per day of VOC. The significant permit modification is being performed pursuant to 326 IAC 2-7-12(b)(1)(E) because the modification to the permit is considered to be a modification under a provision of Title I of the CAA.

Tank 55-3 will be the only tank at this Marathon location "for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984". Therefore, it will be the only tank subject to the NSPS of Subpart Kb of 40 CFR 60. The permit modification will consist of moving Tank 55-3 from Section D.8 to a new Section D.4 in the Marathon Ashland Part 70 permit.

County Attainment Status

This source is located in Lake County. 40 CFR 81.315 – (Indiana) – 7/1/99

Pollutant	Status
PM-10	moderate non-attainment
SO_2	primary non-attainment
NO_2	attainment/unclassifiable
Ozone	severe non-attainment
CO	attainment
Lead	attainment

(a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC are considered when evaluating the rule applicability relating to the ozone standards. Lake County has been designated as severe non-attainment for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

(b) Lake County has been classified as non-attainment for particulates less than ten (10) microns in diameter (PM_{10}) and sulfur dioxide (SO_2). Therefore, these emissions were also reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

Source Status

Existing Source PSD or Emissions Offset Definition (emissions after controls, based upon 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/year)
PM	0
PM-10	0
SO_2	0
VOC	> 25
CO	0
NO_x	0
Single HAP	< 10
Combination of HAPs	< 25

(a) This existing source is not a major stationary source **(for the purposes of PSD)** because even though it is one of the 28 listed source categories **(326 IAC 2-2-1(y)(1)(Z))**, no attainment regulated pollutant is emitted at a rate of 100 tons per year or more.

(b) This existing source is a major stationary source **(for the purposes of Emission Offset)** because it has a potential to emit twenty-five (25) tons per year or more of volatile organic compounds (VOC) in a severe non-attainment ozone area **(326 IAC 2-3-1 (t)(2)).**

(c) These emissions are based on the 2001 emission statement submitted by the source.

Potential to Emit of Modification After Issuance

The table below summarizes the potential to emit, reflecting all limits, of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this Part 70 source modification.

	Potential to Emit (tons/year)						
Process/facility	PM	PM-10	SO_2	VOC	CO	NO_X	HAP(Pb)
Addition of Internal Floating							
Roof to Storage Tank 55-3	0	0	0	4.25	0	0	0.0
PSD and Emission Offset Significant Levels	25	15	40	40 *25	100	40	0.6 (lead)

*326 IAC 2-3-1(s) definition major modification, increase that is not de minimis in severe ozone nonattainment area.
*326 IAC 2-3-1(l) definition de minimis, increase of VOC that does not exceed twenty-five (25) tons per year.

This modification to an existing major stationary source is not major because the emissions increase is "de minimis" for this severe ozone nonattainment area. Therefore, pursuant to 326 IAC 2-3, the Emission Offset requirements do not apply.

Federal Rule Applicability

NSPS

Tank 55-3 will be subject to the New Source Performance Standards (NSPS) in 326 IAC 12, (40 CFR 60.112b, Subpart (Kb), for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) because "construction, reconstruction, or modification commenced after July 23, 1984." The installation of the internal floating roof is considered a modification because the potential to emit of VOC increases because the tank will qualify for gasoline storage whereas without the internal floating roof gasoline storage was not allowed.

a) This rule requires that volatile organic liquid storage vessels with a capacity equal to or greater than 151 cubic meters (39,000 gallons) containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa (0.75 psi) but less than 76.6 kPa (11 psi), shall be equipped with an internal floating roof with appropriate primary and/or secondary seals.

b) Marathon Ashland Petroleum, LLC is adding an internal floating roof to Tank 55-3. The tank will have an internal floating roof with a mechanical shoe seal, qualifying it to service gasoline and less volatile petroleum products. The source has acknowledged the NSPS requirements in their request for this modification.

c) Tank 55-3 will be the only tank at this Marathon location "for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984". Therefore, it will be the only tank subject to 40 CFR 60, Subpart Kb. The permit modification will

consist of moving Tank 55-3 from Section D.8 to a new Section D.4 in the Part 70 permit for this source.

NESHAPS

There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14 and 40 CFR Part 63) applicable to this proposed modification.

State Rule Applicability

326 IAC 2-6 (Emission Reporting)

Tank 55-3 will remain subject to 326 IAC 2-6 (Emission Reporting), because the source emits more than 10 tons/yr of VOC in Lake County. Pursuant to this rule, the source must annually submit an emission statement of the facility. The annual statement must be received by April 15 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

Marathon submits an annual emission statement that includes all petroleum liquid storage tanks.

326 IAC 8-4-3 (Petroleum Liquid Storage Facilities)

Tank 55-3 will be subject to the standards, record keeping, and reporting requirements of 326 IAC 8-4-3, which are similar to the New Source Performance Standards in 40 CFR 60, Subpart Kb.

These standards and requirements will be included in the new Section D of the Part 70 permit. Compliance with the above-mentioned NSPS will meet the requirements of 326 IAC 8-4-3.

326 IAC 8-9 (Volatile Organic Liquid Storage Vessels)

326 IAC 8-9-2(8) exempts this stationary vessel from the standards and requirements in 326 IAC 8-9 because the vessel is subject to the provisions of 40 CFR 60, Subpart Kb, New Source Performance Standards for Volatile Organic Liquid Storage.

Compliance Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The compliance determination requirements applicable to this modification are as follows:

Internal Floating Roof Tank 55-3 shall comply with the visual inspection and repair requirements of 326 12, 40 CFR 60.113b and the record keeping and reporting requirements of 326 IAC 12, 40 CFR 60.115b. Marathon Ashland Petroleum, LLC shall also comply with the record keeping and reporting requirements of 326 IAC 12, 40 CFR 60.116b, and 326 IAC 8-4-3(d).

There are no compliance monitoring requirements for this tank.

Tank 55-3 will be the only tank at this Marathon location "for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984". Therefore, it will be the only tank subject to 40 CFR 60, Subpart Kb. The permit modification will consist of moving Tank 55-3 from Section D.8 to a new Section D.4 in the Part 70 permit for this source.

Minor Source Modification 089-16717-00231 and Significant Permit Modification 089-16719-00231
Part 70 Permit pages affected 1, 4, 5, 7, 36, 38-45.

The following changes were made to the Part 70 Permit T089-7400-00231. **Bold** indicates the items that were added and ~~strike-outs~~ indicate the items that were removed.

1. The cover page (page 1) was modified to add the issuance date of the first significant permit modification (089-16719-00231), and to show the affected pages.

2. On page 4 of 45, in the Table of Contents, Tank 55-3 replaces the Groundwater Treatment System in Section D.4 and the Groundwater Treatment System is moved to a new Section D.9 in order to be consistent with the order of emission units in Section A, Source Summary.

~~**D.4 FACILITY OPERATION CONDITIONS INSIGNIFICANT ACTIVITIES Groundwater Treatment System** 36~~

~~**Emission Limitations and Standards [326 IAC 2-7-5(1)]**~~
~~D.4.1 Volatile Organic Compounds (VOC)~~

~~**Compliance Determination Requirements**~~
~~D.4.2 Testing Requirements [326 IAC 2-7-6(1)]~~

~~**Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]**~~
~~D.4.3 Monitoring~~

~~**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**~~
~~D.4.4 Operating Records~~
~~D.4.5 Reporting Requirements~~

D.4 FACILITY OPERATION CONDITIONS - Storage Tank 55-3 37

Emission Limitations and Standards [326 IAC 2-7-5(1)]
D.4.1 Volatile Organic Compounds (VOC) [326 IAC 12, 40 CFR 60.112b] [326 IAC 8-4-3(b)]
D.4.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

Compliance Determination Requirements
D.4.3 Visual Inspection, Repair, & Notification [326 IAC 12, 40 CFR 60.113b]

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]
D.4.4 Monitoring

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]
D.4.5 Record Keeping and Reporting Requirements (Tank Inspections) [326 IAC 12, 40 CFR 60.115b]
D.4.6 Record Keeping and Reporting Requirements (Product Storage) [326 IAC 12, 40 CFR 60.116b]
D.4.7 Reporting Requirements [326 IAC 12, 40 CFR 60.115b]

3. On page 5 of 45, in the Table of Contents, Tank 55-3 was removed from Section D.8, Facility Operation Conditions, as follows:

D.8 FACILITY OPERATION CONDITIONS - INSIGNIFICANT ACTIVITIES - Tank No. ~~55-3,~~ 80-1, 80-9, 80-4, AA-1-3, AA-8-1, & AA-8-2

4. On page 5 of 45, in the Table of Contents, Section D.9 was added for the Groundwater Treatment System that was displaced from page 4 to maintain the order of emission units as presented in Section A, Source Summary.

D.9 FACILITY OPERATION CONDITIONS - INSIGNIFICANT ACTIVITIES - Groundwater Treatment System

Emission Limitations and Standards [326 IAC 2-7-5(1)]
D.9.1 Volatile Organic Compounds (VOC) [Hammond Air Quality Control Ordinance 3522 (as amended)]

Compliance Determination Requirements
D.9.2 Testing Requirements [326 IAC 2-7-6(1)]

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]
D.9.3 Monitoring

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]
D.9.4 Operating Records
D.9.5 Reporting Requirements

5. On page 7 of 45, in Section A, Source Summary, A.2, Emission Units and Pollution Control Equipment Summary, item (4) was added as follows to include Tank 55-3:

(4) One (1) Petroleum Liquid Storage Tank, identified as Tank 55-3 with the following specifications:

Tank 55-3 has an internal floating roof equipped with a mechanical shoe seal for the storage of gasoline or less volatile petroleum products. The maximum design capacity of the tank is 2,154,894 gallons.

6. On page 7 of 45, in Section A, Source Summary, A.3, Specifically Regulated Insignificant Activities, item (2)(b), Tank 55-3, was removed and the remaining tanks were re-designated as follows:

A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

This stationary source also includes the following insignificant activities which are specifically regulated, as defined in 326 IAC 2-7-1(21):

(1) Storage tanks with capacity less than or equal to 1,000 gallons and annual throughputs less than 12,000 gallons. This includes storage Tank No. AA-1-3, a fixed cone roof tank with a maximum design capacity of 462 gallons.

(2) The following storage tanks which emit less than one (1) ton per year of a single HAP and less than fifteen (15) pounds per day of VOC:

(a) Fixed-cone roof Kerosene storage tank No. 80-11 with a maximum design capacity of 3,360,000 gallons.

~~(b) Fixed-cone roof Kerosene storage tank No. 55-3 with a maximum design capacity of 2,154,894 gallons.~~

~~(c)~~ **(b)** Fixed-cone roof #2 fuel oil storage tank No. 80-1 with a maximum design capacity of 3,360,000 gallons.

~~(d)~~ **(c)** Fixed-cone roof #2 fuel oil storage tank No. 80-9 with a maximum design capacity of 3,277,596 gallons.

~~(e)~~ **(d)** Fixed-cone roof #2 fuel oil storage tank No. 80-4 with a maximum design capacity of 3,360,000 gallons.

~~(f)~~ **(e)** Internal floating roof transmix storage tank No. T-5 with a maximum design capacity of 67,914 gallons. This tank is equipped with a mechanical shoe seal.

~~(g)~~ **(f)** Internal floating roof transmix storage tank No. T-13 with a maximum design capacity of 188,370 gallons. This tank is equipped with mechanical shoe seal.

~~(h)~~ **(g)** Horizontal fixed roof red dye additive storage tank No. AA-1-3 with a maximum design capacity of 462 gallons.

~~(i)~~ **(h)** Fixed-cone roof gasoline additive storage tank No. AA-8-1 with a maximum design capacity of 7,980 gallons.

~~(j)~~ **(i)** Fixed-cone roof gasoline additive storage tank No. AA-8-2 with a maximum design capacity of 7,980 gallons.

7. On page 36 of 45, Section D.4, Tank 55-3 replaces the Groundwater Treatment System as follows. The Groundwater Treatment System is moved to a new Section (D.9) in order to be consistent with the order of emission units in Section A, Source Summary.

Remove:

~~SECTION D.4 FACILITY OPERATION CONDITIONS~~

~~(4) One (1) Groundwater Treatment System including an air stripper with a maximum design rate of 1800 gallons per hour. The system is used to remove hydrocarbons on the terminal site.~~

~~Emission Limitations and Standards [326 IAC 2-7-5(1)]~~

~~D.4.1 Volatile Organic Compounds (VOC)~~

~~Pursuant to the Construction Permit No. 433 and Operation Permit No. 877, the total VOC emissions from the Groundwater Treatment System shall be limited to 1.562 pounds per hour and 6.843 tons per year.~~

~~Compliance Determination Requirements~~

~~D.4.2 Testing Requirements [326 IAC 2-7-6(1)]~~

~~A stack test shall be performed to determine the total VOC emissions from the Vapor Extraction System within twenty-four (24) months of issuance of this permit and repeated no less than once every 5 years thereafter. Testing shall be performed in accordance with 326 IAC 3-2.1 using methods acceptable to the Commissioner.~~

~~Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]~~

~~D.4.3 At minimum, the influent to and the effluent from the air stripper shall be sampled for total VOC once per calendar quarter.~~

~~Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]~~

~~D.4.4 The following process operating records shall be maintained:~~

~~(1) Daily operating hours of the air stripper and the vapor extraction system~~

~~(2) Daily throughput, in gallons, processed through the air stripping unit~~

~~D.4.5 Reporting Requirements~~
~~There are no reporting requirements for this facility.~~

Add:

SECTION D.4 FACILITY OPERATION CONDITIONS

One (1) Petroleum Liquid Storage Tank, identified as Tank 55-3 with the following specifications:

Tank 55-3 has an internal floating roof equipped with a mechanical shoe seal for the storage of gasoline or less volatile petroleum products. The maximum design capacity of the tank is 2,154,894 gallons.

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.4.1 Volatile Organic Compounds (VOC) [326 IAC 12, 40 CFR 60.112b and 326 IAC 8-4-3(b)]

Pursuant to 326 IAC 12, 40 CFR 60.112b and 326 IAC 8-4-3(b), Tank 55-3, in order to store gasoline:

a) Shall have a fixed roof in combination with an internal floating roof that shall be floating on the liquid surface at all times, except during initial fill and those intervals when the storage vessel is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible.

b) The internal floating roof shall be equipped the above-mentioned mechanical shoe seal or one of the equivalent closure devices as defined in accordance with 40 CFR 60.112b(a)(1)(ii).

D.4.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan of this permit, is required for this facility and any control devices.

Compliance Determination Requirements

D.4.3 Visual Inspection, Repair, and Notification [326 IAC 12, 40 CFR 60.113b]

(a) The internal floating roof storage vessel shall comply with the following testing and procedures requirements (visual inspections, repairs, notifications) of 326 IAC 12, 40 CFR 60.113b.

(b) Pursuant to 326 IAC 12, 40 CFR 60.113b, a visual inspection should be made of the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the vessel with VOL. For storage vessels equipped with a liquid-mounted or mechanical shoe primary seal, visual inspections should be performed annually. For vessels equipped with both primary and secondary seals, a visual inspection should be performed at least every five (5) years.

(c) Pursuant to 326 IAC 12, 40 CFR 60.115b(a)(3), if during the required annual visual inspection, the internal floating roof is not resting on the surface of the VOL, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric, the owner or operator shall repair the items or empty and remove the vessel from service within forty-five (45) days. Records of such incidents shall be maintained and a report shall be furnished to the department within thirty (30) days of the inspection. The report shall identify the following:

1) The vessel by identification number

2) The nature of the defects

3) The date the vessel was emptied or the nature of and date the repair was made.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.4.4 There are no compliance monitoring requirements for this facility.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.4.5 Record Keeping and Reporting Requirements (Tank Inspections) [326 IAC 12, 40 CFR 60.115b]

(a) The internal floating roof storage vessel shall comply with the following record keeping and reporting requirements as outlined in 326 IAC 12, 40 CFR 60.115b(a)(2).

(b) Pursuant to 326 IAC 12, 40 CFR 60.115b(a)(2), a record of each inspection performed shall be maintained and shall identify the following:

1) The vessel inspected by identification number.

2) The date the vessel was inspected.

3) The observed condition of each component of the control equipment, including the following: seals, internal floating roof, and fittings.

D.4.6 Record Keeping and Reporting Requirements (Product Storage) [326 IAC 12, 40 CFR 60.116b]

(a) The internal floating roof storage vessel shall comply with the following record keeping and reporting requirements as outlined in 326 IAC 12, 40 CFR 60.116b(c), Subpart Kb and 326 IAC 8-4-3(d).

(b) Pursuant to 326 IAC 12, 40 CFR 60.116b(c), Subpart Kb and 326 IAC 8-4-3(d), records of the petroleum liquid stored, the period of storage and the maximum true vapor pressure of that liquid as stored during the respective storage period shall be maintained for a minimum period of two (2) years and made available upon request by IDEM-OAQ or HDEM.

D.4.7 Reporting Requirements [326 IAC 12, 40 CFR 60.115b]

A report of any defects (the internal floating roof not resting on the surface of the VOL, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric) discovered shall be furnished to the department within thirty (30) days of the inspection. The report shall identify the vessel identification number, the nature of the defects, and the date the vessel was emptied or the nature of and date the repair was made.

8. On page 38 of 45, in Section D.6, Facility Operation Conditions – Insignificant Activities, item (2)(g) in the facility description box, is changed to (2)(f) as follows due to the removal of Tank 55-3 from that part of Section A:

(2)~~(g)~~**(f)** A petroleum liquid storage tank, identified as Tank No. T -13. The tank has an internal floating roof with a mechanical shoe seal. Maximum design capacity is 188,370 gallons for storage of transmix with a true vapor pressure of 2.3 psi at 49 °F.

9. On page 39 of 45, in Section D.7, Facility Operation Conditions – Insignificant Activities, item (2)(f) in the facility description box, is changed to (2)(e) as follows due to the removal of Tank 55-3 from that part of Section A:

(2)~~(f)~~**(e)** A petroleum liquid storage tank, identified as Tank No. T-5. The tank has an internal floating roof with a mechanical shoe seal. Maximum design capacity is 67,914 gallons for storage of transmix with a true vapor pressure of 2.3 psi at 49 °F.

10. On page 40 of 45, in Section D.8, Facility Operation Conditions – Insignificant Activities, item (2)(b), Tank 55-3, was removed and the remaining tanks were re-designated as follows:

~~Seven (7)~~ **Six (6)** petroleum liquid storage tanks, identified as Tank Nos. ~~55-3,~~ 80-1 80-9, 80-4, AA-1-3, AA-8-1, and AA-8-2. Tank specifications are as follows: ~~(2)(b) Tank No. 55-3 has a fixed cone roof and a maximum design capacity of 2,154,894 gallons for storage of Jet kerosene with a true vapor pressure of 0.005 psi at 49 °F.~~ (2)~~(c)~~ **(b)** Tank No. 80-1 has a fixed cone roof and a maximum design capacity of 3,360,000 gallons for storage of No. 2 Fuel Oil with a true vapor pressure of 0.005 psi at 49 °F. (2)~~(d)~~ **(c)** Tank No. 80-9 has a fixed roof and a maximum design capacity of 3,277,596 gallons for storage of No. 2 Fuel Oil with a true vapor pressure of 0.005 psi at 49 °F. (2)~~(e)~~ **(d)** Tank No. 80-4 has a fixed cone roof and a maximum design capacity of 3,360,000 gallons for storage of No. 2 Fuel Oil with a true vapor pressure of 0.005 psi at 49 °F. (2)~~(h)~~ **(g)** Tank No. AA-1-3 is a horizontal fixed roof tank with a maximum design capacity of 462 gallons for storage of Red Dye Additive with a true vapor pressure of 0.06 psia. (2)~~(i)~~ **(h)** Tank No. AA-8-1 has a fixed roof and a maximum design capacity of 7,980 gallons for storage of Gasoline Additive with a true vapor pressure of 2.4 psia. (2)~~(j)~~ **(i)** Tank No. AA-8-2 has a fixed roof and a maximum design capacity of 7,980 gallons for storage of Gasoline Additive with a true vapor pressure of 2.4 psia.

11. On page 41 of 45, the Groundwater Treatment System, formerly Section D.4, is moved to this new Section D.9 and a typographical error is corrected in order to be consistent with the order of emission units in Section A, Source Summary.

Add:

SECTION D.9 FACILITY OPERATION CONDITIONS

~~(4)~~ (3) One (1) Groundwater Treatment System including an air stripper with a maximum design rate of 1800 gallons per hour. The system is used to remove hydrocarbons on the terminal site.

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.9.1 Volatile Organic Compounds (VOC) [Hammond Air Quality Ordinance 3522 (as amended)]

Pursuant to the Construction Permit No. 433 and Operation Permit No. 877, the total VOC emissions from the Groundwater Treatment System shall be limited to 1.562 pounds per hour and 6.843 tons per year.

Compliance Determination Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.9.2 Testing Requirements [326 IAC 2-7-6(1)]

A stack test shall be performed to determine the total VOC emissions from the Vapor Extraction System within twenty-four (24) months of issuance of this permit and repeated no less than once every 5 years thereafter. Testing shall be performed in accordance with 326 IAC 3-2.1 using methods acceptable to the Commissioner.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.9.3 At minimum, the influent to and the effluent from the air stripper shall be sampled for total VOC once per calendar quarter.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.9.4 The following process operating records shall be maintained:

(1) Daily operating hours of the air stripper and the vapor extraction system

(2) Daily throughput, in gallons, processed through the air stripping unit

D.9.5 Reporting Requirements [326 IAC 2-7-5(3)]
There are no reporting requirements for this facility.

12. The record keeping and reporting forms on pages 41 through 45 were moved to 44 through 48 and the permit was re-paginated due to the addition of Section D.9.

All other sections of the permit and their corresponding conditions shall remain unchanged and in effect.

Conclusion

The construction of this proposed modification (addition of an internal floating roof to Tank 55-3) shall be subject to the conditions of the attached proposed Part 70 Minor Source Modification **089-16717-00231** and Significant Permit Modification **089-16719-00231**.

Hammond Department of Environmental Management
Emission Inventory System Update (EIS)
Storage of Organic Liquids ... AP-42 ... Section 7

Tank 55-3 - Current Service - Vertical Fixed Roof Tank with Fuel Oil #2

Minor Source Modification 089-16717-00231 and Significant Permit Modification 089-16719-00231

General Information:

Company Name	**Marathon Ashland Petroleum, LLC**	
Year of Data	**review**	
Plant ID #	089-00231	

Tank Information:

Tank ID #	**55-3**	
Tank Shell Diameter	90	feet
Tank Shell Height	48	feet
Tank Capacity (max liquid)	2,242,212	gallons

Product Information:

Product Stored	Fuel Oil #2	
*Vapor Molecular Weight	130.0	lb/lb-mole
*True Vapor Pressure @ 60° F	0.0074	psia - @ 60° F
*True Vapor Pressure @ 40° F	0.0031	psia - @ 40° F
Annual Product Throughput	36,480,789	gallons/yr
Average Annual Liquid Height	23	feet

(If unknown, use half of tank shell height.)

*This product information available in the AP-42, Section 7.
*if tank is not white, or if it contains crude oils - see calculations

Ls = Standing Storage Losses =	0.1795	Tons/yr
Lw = Working Losses =	0.4178	Tons/yr
Lt = Ls + Lw = Total Losses =	**0.5973**	**Tons/yr**

RH 10/28/02

See AP-42, Section 7, for clarification of the following calculations:

Ls = Standing Storage Losses = 365*(Vv)*(Wv)*(Ke)*(Ks)

Hr = tank roof height = Sr*Rs = 0.0625*(D/2) =	2.813	feet
Hro = roof outage = Hr/3 =	0.938	feet
Hl = liquid height (1/2 tank height if unknown) =	23.000	feet
Hs = tank shell height =	48.000	feet
Hvo = vapor space outage = Hs - Hl + Hro =	25.938	feet
D = tank diameter =	90.000	feet
Vv =Tank Vapor Space Volume = (π/4)*(D^2)*(Hvo) =	165007.245	cft
Mv = vapor molecular weight (Tables 7.1-2 & 3)	130.0	lb/lb-mole
Pva = vapor pressure at TLa (Tables 7.1-2 & 3)	0.0074	psia @ 50-60°F
TLa = daily average liquid surface temperature°R	510.843	°R
as calculated for Chicago area using AP-42, Section 7		
Wv = Vapor Density = (Mv*Pva)/(10.731*TLa) =	0.0001755	lb/cft
ΔTa = daily ambient temp range (Chgo area) =	19.00	°R
∂ = tank paint solar absorptance (Table 7.1-7)=	0.17	dimensionless
***(this factor (∂) will change for non-white tanks)**		
I = daily total solar insolation factor (Chgo) =	1215	Btu/sqft•day
ΔTv = daily vapor temp range =		
= 0.72*(ΔTa) + 0.028*(∂)*(I) =	19.4634	°R
TLa = daily average liquid surface temp °R	510.843	°R
ΔPv = daily vpr pres range = Pv@60-Pv@40 =	0.0043	psia
ΔPb = breather vent pressure setting range =	0.06	psig
Pa = atmospheric pressure =	14.7	psia
Pva = vapor pressure at TLa (Tables 7.1-2 & 3)	0.0074	psia
Ke = Vapor Space Expansion Factor =		
(ΔTv/TLa) + (ΔPv-ΔPb)/(Pa-Pva) =	0.034310	dimensionless
Ks = Vented Vapor Saturation Factor =		
1/(1+ 0.053*Pva*Hvo) =	0.989930	dimensionless

Ls = Standing Storage Losses, lb/yr

Ls = 365*(Vv)*(Wv)*(Ke)*(Ks)

Ls = 358.974 lb/yr

See AP-42, Section 7, for clarification of the following calculations:

Lw = Working Losses = 0.0010*(Mv)*(Pva)*(Q)*(Kn)*(Kp)

Q = annual net thruput, bbl/yr - (42 gal/bbl) =	868,590.2	bbl/yr
VLx = tank max liquid volume - (7.481 gal/cft)	299,720.9	cft
N = # of turnovers per year = 5.614*Q/VLx =	16.3	dimensionless
Kn = turnover factor, =1 unless N>36	1.0000	dimensionless
Kp = working loss product factor =	1.00	dimensionless

*** Kp = 0.75 for crude oils,**
1.0 for all other products

Lw = Working Losses, lb/yr

Lw = 0.0010*(Mv)*(Pva)*(Q)*(Kn)*(Kp)

Lw = 835.584 lb/yr

The End

Hammond Department of Environmental Management
Emission Inventory System Update (EIS)
Storage of Organic Liquids ... AP-42 ... Section 7

Tank 55-3 - Proposed Service - Internal Float Roof Tank with Gasoline

Minor Source Modification 089-16717-00231 and Significant Permit Modification 089-16719-00231

General Information:

Company Name	**Marathon Ashland Petroleum, LLC**	
Year of Data	**review**	
Plant ID #	089-0231	

Tank Information:

Tank ID #	**55-3**	
Tank Shell Diameter	90	feet
Tank Shell Height	48	feet
*Tank Shell Type (Welded or Riveted)	Welded	
*Tank Deck Type (Welded or Bolted)	Welded	
*Tank Rim Seal Type	Mechanical Shoe	
Tank Capacity (max liquid)	2,154,894	gallons

Product Information: **

Product Stored	gasoline	
Vapor Molecular Weight	67.0	lb/lb-mole
True Vapor Pressure @ 60° F.	6.0	psia - @ 60° F
Average Organic Liquid Density	5.6	lb/gal
Annual Product Throughput	129,293,640	gallons/yr

*if this information changes, see calculations
if tank contains crude oil, see calculations
**This product information available in the AP-42, Section 7.

Lr =	Rim Seal Loss =	1.179	Tons/yr
Lwd =	Withdrawal Loss =	0.145	Tons/yr
Lf =	Deck Fitting Losses =	2.964	Tons/yr
Ld =	Deck Seam Loss =	0.000	Tons/yr
Lt = Lr + Lwd + Lf = Total Loss =		**4.287**	**Tons/yr**

RH 10/28/02

See AP-42, Section 7, for clarification of the following calculations:

* asterisked items change with rim seal information (see AP-42, Section 7)

Rim Seal Loss:

*	Kr = seal factor (see Table 7.1-14) =	3.0	lb-mole/ft•yr
	P* = vapor pres. function - Equation (3-3) =	0.130385	dimensionless
	D = tank diameter =	90	feet
	Mv = vapor molecular weight (Table 7.1-3)	67.00	lb/lb-mole
crude?	Kc = product factor, Kc = 0.4 for crude oils, Kc = 1 for all other organic liquids	1.0	

Lr = Rim Seal Loss = (Kr)*(P*)*(D)*(Mv)*(Kc) = 2358.658 lb/yr

Withdrawal Loss:

Q = annual throughput, (42 gal/bbl) =	3078420	bbl/yr
WL = ave. organic liquid density (Table 7.1-3) =	5.6	lb/gal
D = tank diameter =	90	feet
Nc = number of columns =	6	
C = shell clingage factor, (see Table 7.1-10) =	0.0015	bbl/1000 sqft
C = 0.006 for crude oil		

Lwd =

Withdrawal Loss = (0.943*Q*C*WL/D)(1+Nc/D) = 289.005 lb/yr

Deck Fitting Loss:

Ff = total deck fitting loss factor (Table 7.1-16) =	678.5	lb-mole/yr
(go to cell G47)		
P*,Mv, and Kc as defined in above calculations		

Lf = Deck Fitting Losses = (Ff)*(P*)*(Mv)*(Kc) = 5927.220 lb/yr

Deck Seam Loss:

Kd = deck seam loss per unit seam length factor=	0.00	lb/mole/ft-yr
(0.0 for welded deck, 0.34 for bolted deck)		
Sd = deck seam length factor =	0.2	ft/sqft
D,P*,Mv, and Kc are as defined above		

Ld =

Deck Seam Loss = (Kd)*(Sd)*(D^2)*(P*)*(Mv)*(Kc)= 0.000 lb/yr

Tanks with welded decks do not have deck seam losses

The End

Appendix A

Kr
VMP = 6.7
LMP = 3.0
VMP w/sec = 2.5
LMP w/sec = 1.6
MechShoe = 3.0
MS w/sec = 1.6

Appendix A

Summary of Internal Float Roof Tank Deck Fitting Loss Factors
for typical numbers based on tank diameter, see AP-42, Table 7.1-16
if tank-specific data is unavailable use Figures 7.1-24 and 25

Deck Fitting Type	Quantity	Factor	Total
Access Hatch:			
Bolted Cover, Gasketed	0	1.6	0
Unbolted Cover, Gasketed	0	11	0
Unbolted Cover, Ungasketed	1	25	25
Automatic Gauge Float Well:			
Bolted Cover, Gasketed	0	5.1	0
Unbolted Cover, Gasketed	0	15	0
Unbolted Cover, Ungasketed	1	28	28
Column Well:			
Builtup Column - Sliding cover, Gasketed	0	33	0
Builtup Column - Sliding Cover, Ungasketed	6	47	282
Pipe Column - Flexible Fabric Sleeve Seal	0	10	0
Pipe Column - Sliding Cover, Gasketed	0	19	0
Pipe Column - Sliding Cover, Ungasketed	0	32	0
Ladder Well:			
Sliding Cover, Gasketed	0	56	0
Sliding Cover, Ungasketed	1	76	76
Roof Leg or Hanger Well:			
Adjustable	28	7.9	221.2
Fixed	0	0	0
Sample Pipe or Well:			
Slotted Pipe - Sliding Cover, Gasketed	0	44	0
Slotted Pipe - Sliding Cover, Ungasketed	0	57	0
Sample Well - Slit Fabric Seal, (10% open area)	1	12	12
Stub Drain, 1" diameter	28	1.2	33.6
Vacuum Breaker:			
Weighted Mechanical Actuation, Gasketed	1	0.7	0.7
Weighted Mechanical Actuation, Ungasketed	0	0.9	0
Total Deck Fitting Loss Factor (Ff) =			**678.5**