INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

TO: Interested Parties / Applicant

DATE: February 10, 2009

RE: SemMaterials, L.P. / 085-27367-00066

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Notice of Decision: Approval - Registration

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 4-21.5-3-4(d) this order is effective when it is served. When served by U.S. mail, the order is effective three (3) calendar days from the mailing of this notice pursuant to IC 4-21.5-3-2(e).

If you wish to challenge this decision, IC 4-21.5-3-7 requires that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
(2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for considerations at any hearing; and
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FN-REGIS.dot 1/2/08

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Mr. TJ Williams
SemMaterials, L.P.
2820 East Durbin Street
Warsaw, Indiana 46580

February 10,2009

Re: Registration Revision
No. R 085-27367-00066

Dear Mr. Williams:

SemMaterials, L.P. was issued a Registration No. R 085-16440-00066 on December 10, 2002 for a stationary asphalt materials storage source located at 2820 East Durbin Street, Warsaw, Indiana 46580. On January 13, 2009, the Office of Air Quality (OAQ) received an application from the source requesting that the registration be updated to remove two tanks and to indicate the exact maximum capacity of the tanks.

Pursuant to 326 IAC 2-5.5~~-6~~, the registration is hereby revised as follows, with deleted language as ~~strikeouts~~ and new language **bolded**:

(1) The descriptions of tanks have been revised to reflect the contents and maximum capacity of each tank in Section A.1 and D.1 as follows.

(a) One (1) boiler, fueled by natural gas only, identified as B-1, heat capacity is ~~6.28~~ **5.02** mmBtu per hour. Stack height is 15 feet with a diameter of 24 inches.

(b) One (1) hot water heater, fueled by natural gas only, identified as WH-1, heat capacity is 3.0 mmBtu per hour. Two (2) stacks, each has a height of 13 feet and a diameter of 16 inches.

(c) One (1) hot oil heater, fueled by natural gas only, identified as HO-1, heat capacity is 8.4 mmBtu per hour. Stack height is 15 feet with a diameter of 24 inches.

(d) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-1, heat capacity is 1.25 mmBtu per hour. Stack height is 22 feet with a diameter of 10.75 inches.

(e) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-2, heat capacity is 1.72 mmBtu per hour. Stack height is 33 feet with a diameter of 10.75 inches.

(f) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-3, heat capacity is 1.72 mmBtu per hour. Stack height is 33 feet with a diameter of 10.75 inches.

(g) One (1) loading rack, product name is asphalt ~~emulsion~~, truck rack ~~annual~~ throughput is ~~93,440.0 Mgal~~ **18,000 gallons** per hour.

(h) One (1) loading rack, product name is **asphalt and** polymer modified asphalt, truck rack annual throughput is ~~16,700 Mgal~~ **18,000 gallons** per hour.

(i) Three (3) emulsion loading racks, identified as 1, 2, 3, each having a throughput of 18,000 gallons per hour.

(j) One (1) emulsion loading rack, identified as 4, having a throughput of ~~8,000~~ **12,000** gallons per hour.

(k) Storage Tanks:

(1) Tank 101: storing asphalt cement, **constructed in 1976,** with a storage capacity of ~~20,000~~ **20,080** gallons and annual throughput of ~~877,400~~ **1,547,800** gallons per year, with a diameter of 10.5 feet and height of 31.0 feet**, and a true vapor pressure less than 0.5 psi**.

(2) Tank 102: storing asphalt cement, **constructed in 1976,** with a storage capacity of ~~84,000~~ **82,751** gallons and annual throughput of ~~368,5100~~ **7,717,000** gallons per year, with a diameter of 29.67 feet and height of 16.0 feet**, and a true vapor pressure less than 1.0 psi**.

(3) Tank 103: storing asphalt cement, **constructed in 1976,** with a storage capacity of ~~84,000~~ **82,751** gallons and annual throughput of ~~3,685,100~~ **7,717,000** gallons per year, with a diameter of 29.67 feet and height of 16.0 feet**, and a true vapor pressure less than 1.0 psi**.

(4) Tank 104: storing asphalt cement, **constructed in 1992,** with a storage capacity of 168,000 gallons and annual throughput of ~~7,370,000~~ **13,343,000** gallons per year, with a diameter of 29.89 feet and height of 32.0 feet**, and a true vapor pressure less than 0.5 psi**.

(5) Tank 105: storing asphalt cement, **constructed in 1978,** with a storage capacity of ~~500,000~~ **489,002** gallons and annual throughput of ~~33,447,300~~ **38,847,000** gallons per year, with a diameter of 51.0 feet and height of 32.0 feet**, and a true vapor pressure less than 1.0 psi**.

(6) Tank 106: storing asphalt cement, **constructed in 1980,** with a storage capacity of ~~500,000~~ **489,002** gallons and annual throughput of ~~877,400~~ **38,847,000** gallons per year, with a diameter of 51.0 feet and height of 32.0 feet**, and a true vapor pressure less than 1.0 psi**.

(7) Tank 107: storing asphalt cement, **constructed in 1975,** with a storage capacity of ~~24,681~~ **24,614** gallons and annual throughput of ~~1,082,800~~ **1,955,000** gallons per year, with a diameter of 10.5 feet and height of 38.0 feet**, and a true vapor pressure less than 0.5 psi**.

(8) Tank 108: storing asphalt cement, **constructed in 2001,** with a storage capacity of 4,219,783 gallons, with a diameter of 134 feet and height of 40 feet**, and a true vapor pressure less than 0.5 psi**

(9) Tank 120: storing asphalt cement, **constructed in 1982,** with a storage capacity of ~~25,000~~ **24,614** gallons and annual throughput of ~~15,656,600~~ **15,434,300** gallons per year, with a diameter of 10.5 feet and height of 38.0 feet**, and a true vapor pressure less than 0.5 psi**..

~~(10) Tank 140: storing asphalt cement batch, with a storage capacity of 1,500 gallons and annual throughput of 1,043,800 gallons per year, with a diameter of 7.0 feet and height of 7.5 feet.~~
[Note: this tank is no longer in service]

~~(27)~~**(10) Tank 300: storing molten sulfur tank, constructed in 2004, with storage capacity of 5,264 gallons.**
[Note: this tank was moved from item (27)]

(11) Tank 150: storing asphalt cement batch, **constructed in 1982,** with a storage capacity of ~~24,000~~ **24,065** gallons and annual throughput of ~~16,700,400~~ **15,434,300** gallons per year, with a diameter of 16.0 feet and height of 16.0 feet**, and a true vapor pressure less than 0.5 psi**.

(12) Tank 201: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~42,000~~ **44,529** gallons and annual throughput of ~~5,250,200~~ **10,451,850** gallons per year, with a diameter of 15.39 feet and height of 32.0 feet**, and a true vapor pressure less than 1.0 psi**.

(13) Tank 202: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~42,000~~ **44,529** gallons and annual throughput of ~~5,250,200~~ **410,451,850** gallons per year, with a diameter of 15.39 feet and height of 32.0 feet**, and a true vapor pressure less than 1.0 psi**.

(14) Tank 203: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~42,000~~ **42,529** gallons and annual throughput of ~~5,250,200~~ **10,451,850** gallons per year, with a diameter of 15.39 feet and height of 32.0 feet**, and a true vapor pressure less than 1.0 psi**.

(15) Tank 204: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~42,000~~ **44,529** gallons and annual throughput of ~~5,250,200~~ **10,451,850** gallons per year, with a diameter of 15.39 feet and height of 32.0 feet**, and a true vapor pressure less than 1.0 psi**.

(16) Tank 205: storing asphalt emulsion **and cutback emulsion**, **constructed in 2003,** with a storage capacity of ~~63,000~~ **40,304** gallons and annual throughput of ~~7,875,300~~ **9,460,000** gallons per year, with a diameter of ~~21.5~~ **14.0** feet and height of ~~24.0~~ **35.0** feet**, and a true vapor pressure less than 0.5 psi**.

(17) Tank 206: storing asphalt emulsion **and cutback emulsion**, **constructed in 2003,** with a storage capacity of ~~63,000~~ **40,304** gallons and annual throughput of ~~7,875,300~~ **9,460,000** gallons per year, with a diameter of ~~21.5~~ **14.0** feet and height of ~~24.0~~ **35.0** feet**, and a true vapor pressure less than 0.5 psi**.

(18) Tank 207: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~63,000~~ **65,179** gallons and annual throughput of ~~7,875,300~~ **15,298,700** gallons per year, with a diameter of 21.5 feet and height of 24.0 feet**, and a true vapor pressure less than 1.0 psi**.

(19) Tank 208: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~63,000~~ **65,179** gallons and annual throughput of ~~7,875,300~~ **15,298,700** gallons per year, with a diameter of 21.5 feet and height of 24.0 feet**, and a true vapor pressure less than 1.0 psi**.

(20) Tank 209: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~124,000~~ **124,127** gallons and annual throughput of ~~15,500,500~~ **29,134,800** gallons per year, with a diameter of 29.67 feet and height of 24.0 feet**, and a true vapor pressure less than 1.0 psi**.

(21) Tank 210: storing asphalt emulsion, **constructed in 1975,** with a storage capacity of ~~124,000~~ **124,127** gallons and annual throughput of ~~15,500,500~~ **29,134,800** gallons per year, with a diameter of 29.67 feet and height of 24.0 feet**, and a true vapor pressure less than 1.0 psi**.

(22) Tank 211: storing asphalt emulsion, **constructed in 2008,** with a storage capacity of 42,300 gallons and annual throughput of ~~12,220,110~~ **9,928,800** gallons per year, with a diameter of 15.0 feet and height of 32 feet**, and a true vapor pressure less than 0.5 psi**.

(23) Tank 212: storing asphalt emulsion, **constructed in 1986,** with a storage capacity of ~~48,000~~ **48,129** gallons and annual throughput of ~~6,000,200~~ **11,296,800** gallons per year, with a diameter of 16.0 feet and height of 32.0 feet**, and a true vapor pressure less than 0.5 psi**.

(24) Tank 400: storing fuel oil, **constructed in 1975,** with a storage capacity of ~~20,135~~ **20,080** gallons and annual throughput of ~~14,016,000~~ **29,039,400** gallons per year, with a diameter of 10.5 feet and height of 31.0 feet**, and a true vapor pressure less than 0.5 psi**.

(25) Tank 401: storing LD-95, **constructed in 1975,** with a storage capacity of ~~10,410~~ **10,364** gallons, with a diameter of 10.5 feet and height of 16.0 feet.

(26) ~~Tank 410: storing asphalt emulsion, with a storage capacity of 20,135 gallons, with a diameter of 10.5 feet and height of 16.0 feet.~~
[Note: this tank is no longer in service]

~~(27)~~ ~~Tank 300: storing molten sulfur tank, with storage capacity of 5,264 gallons.~~
[Note: this tank was moved up to item (10) above]

(2) Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) applies to a tank which constructed or modified after July 23, 1984. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 (40,000 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (0.5 psi) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa (2.18 psi).

The requirements of 40 CFR 60, Subpart Kb are not applicable to all tanks for the following reasons:

(a) tanks 101, 107, 120, 150, and 400, each has a capacity greater than 19,813 gallons but less than 40,000 gallons, each was constructed or modified before 1984 and each has a true vapor pressure less than 2 psi.

(b) each of following tanks; 102, 103, 105, 106, 201, 202, 203, 204, 207, 208, 209, and 210 has a capacity greater than 40,000 gallons but each was constructed or modified before 1984, and
[Note: per source, the maximum capacity of each unit change was a result of re-calculating the capacity of each unit, no modification has been done to each unit.]

(b) each of the following tanks; 104, 108, 205, 206, 211 and 212 has a capacity greater than 40,000 gallons and each was constructed or modified after 1984, but each has a true vapor pressure less than 0.5 psi.

Therefore, the requirements of the New Source Performance Standard (Subpart Kb) have been deleted from Section D.1 as follows:

~~Emission Limitations and Standards [326 IAC 2-5.1-2(f)(1)] [326 IAC 2-5.5-4(a)(1)]~~

~~D.1.1 New Source Performance Standards (NSPS) for Performance for Volatile Organic Liquid Storage Vessels [40 CFR Part 60, Subpart Kb] [326 IAC 12-1]~~

~~Tank 104 is subject to the New Source Performance Standard, 326 IAC 12, (40 CFR Part 60.116(b)) Subpart Kb. This rule requires the source owner/operator to keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel.~~

(3) The requirements of 326 IAC 8-5-2 (Asphalt paving rules) applies to this source because the source manufactures and stores cutback asphalt or asphalt emulsion. Therefore, this provision was added to the Condition D.1.1 as follows:

D.1.1 Asphalt Paving [326 IAC 8-5-2]

The source shall not cause or allow the use of cutback asphalt or asphalt emulsion containing more than seven percent (7%) oil distillate by volume of emulsion as determined by ASTM D244-80a "Emulsific Asphalts" ASTM part 15, 1981 ASTM 1916 Race St., Philadelphia, PA 19103, Library of Congress Card Catalog #40-10712, for any paving application except as used for the following purposes:

(1) penetrating prime coating;
(2) stockpile storage; and
(3) application during the months of November, December, January, February, and March.

No other Federal and State rules are applicable to these tanks. Please find enclosed the revised registration.

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, please contact Renee Traivaranon at (800) 451-6027, press 0 and ask for Renee Traivaranon or extension 4-5615 or dial (317) 234-5615.

Sincerely,

Iryn Calilung, Section Chief
Permits Branch
Office of Air Quality

IC/rt
Attachments
cc: File - Kosciusko County
Kosciusko County Health Department
Air Compliance Section
IDEM Northern Regional Office

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REGISTRATION
OFFICE OF AIR QUALITY

SemMaterials, L.P.
2820 East Durbin Street
Warsaw, Indiana 46580

Pursuant to 326 IAC 2-5.1 (Construction of New Sources: Registrations) and 326 IAC 2-5.5 (Registrations), (herein known as the Registrant) is hereby authorized to construct and operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this registration.

Registration No. 085-16440-00066	
Original signed by: Paul Dubenetzky Permits Branch Office of Air Quality	Issuance Date: December 10, 2002

First Registration Revision No. 085-16930-00066, issued on April 7, 2003
First Registration Notice-Only Change No. 085-18338-00066, issued on April 15, 2004
Second Registration Notice-Only Change No. 085-21276-00066, issued on July 7, 2005
Second Registration Revision No. 085-26171-00066, issued on March 17, 2008

Third Registration Revision No. 085-27367-00066	
Issued by: Iryn Calilung, Section Chief Permits Branch Office of Air Quality	Issuance Date: February 10, 2009

SECTION A SOURCE SUMMARY

This registration is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Registrant 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 Registrant to obtain additional permits pursuant to 326 IAC 2.

A.1 General Information

The Registrant owns and operates a stationary asphalt emulsion manufacturing and asphalt storage source.

Source Address:	2820 East Durbin Street, Warsaw, Indiana 46580
Mailing Address:	2820 East Durbin Street, Warsaw, Indiana 46580
General Source Phone Number:	(563) 584-1893
SIC Code:	2852
County Location:	Kosciusko County
Source Location Status:	Attainment for all criteria pollutants
Source Status:	Registration

A.2 Emission Units and Pollution Control Equipment Summary

This stationary source consists of the following emission units and pollution control devices:

(a) One (1) boiler, fueled by natural gas only, identified as B-1, heat capacity is 5.02 mmBtu per hour. Stack height is 15 feet with a diameter of 24 inches.

(b) One (1) hot water heater, fueled by natural gas only, identified as WH-1, heat capacity is 3.0 mmBtu per hour. Two (2) stacks, each has a height of 13 feet and a diameter of 16 inches.

(c) One (1) hot oil heater, fueled by natural gas only, identified as HO-1, heat capacity is 8.4 mmBtu per hour. Stack height is 15 feet with a diameter of 24 inches.

(d) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-1, heat capacity is 1.25 mmBtu per hour. Stack height is 22 feet with a diameter of 10.75 inches.

(e) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-2, heat capacity is 1.72 mmBtu per hour. Stack height is 33 feet with a diameter of 10.75 inches.

(f) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-3, heat capacity is 1.72 mmBtu per hour. Stack height is 33 feet with a diameter of 10.75 inches.

(g) One (1) loading rack, product name is asphalt, truck rack throughput is 18,000 gallons per hour.

(h) One (1) loading rack, product name is asphalt and polymer modified asphalt, truck rack annual throughput is 18,000 gallons per hour.

(i) Three (3) emulsion loading racks, identified as 1, 2, 3, each having a throughput of 18,000 gallons per hour.

(j) One (1) emulsion loading rack, identified as 4, having a throughput of 12,000 gallons per hour.

(k) Storage Tanks:

(1) Tank 101: storing asphalt cement, constructed in 1976, with a storage capacity of 20,080 gallons and annual throughput of 1,547,800 gallons per year, with a diameter of 10.5 feet and height of 31.0 feet, and a true vapor pressure less than 0.5 psi.

(2) Tank 102: storing asphalt cement, constructed in 1976, with a storage capacity of 82,751 gallons and annual throughput of 7,717,000 gallons per year, with a diameter of 29.67 feet and height of 16.0 feet, and a true vapor pressure less than 1.0 psi.

(3) Tank 103: storing asphalt cement, constructed in 1976, with a storage capacity of 82,751 gallons and annual throughput of 7,717,000 gallons per year, with a diameter of 29.67 feet and height of 16.0 feet, and a true vapor pressure less than 1.0 psi.

(4) Tank 104: storing asphalt cement, constructed in 1992, with a storage capacity of 168,000 gallons and annual throughput of 13,343,000 gallons per year, with a diameter of 29.89 feet and height of 32.0 feet, and a true vapor pressure less than 0.5 psi.

(5) Tank 105: storing asphalt cement, constructed in 1978, with a storage capacity of 489,002 gallons and annual throughput of 38,847,000 gallons per year, with a diameter of 51.0 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(6) Tank 106: storing asphalt cement, constructed in 1980, with a storage capacity of 489,002 gallons and annual throughput of 38,847,000 gallons per year, with a diameter of 51.0 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(7) Tank 107: storing asphalt cement, constructed in 1975, with a storage capacity of 24,614 gallons and annual throughput of 1,955,000 gallons per year, with a diameter of 10.5 feet and height of 38.0 feet, and a true vapor pressure less than 0.5 psi.

(8) Tank 108: storing asphalt cement, constructed in 2001, with a storage capacity of 4,219,783 gallons, with a diameter of 134 feet and height of 40 feet, and a true vapor pressure less than 0.5 psi.

(9) Tank 120: storing asphalt cement, constructed in 1982, with a storage capacity of 24,614 gallons and annual throughput of 15,434,300 gallons per year, with a diameter of 10.5 feet and height of 38.0 feet, and a true vapor pressure less than 0.5 psi.

(10) Tank 300: storing molten sulfur tank, constructed in 2004, with storage capacity of 5,264 gallons.

(11) Tank 150: storing asphalt cement batch, constructed in 1982, with a storage capacity of 24,065 gallons and annual throughput of 15,434,300 gallons per year, with a diameter of 16.0 feet and height of 16.0 feet, and a true vapor pressure less than 0.5 psi.

(12) Tank 201: storing asphalt emulsion, constructed in 1975, with a storage capacity of 44,529 gallons and annual throughput of 10,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(13) Tank 202: storing asphalt emulsion, constructed in 1975, with a storage capacity of 44,529 gallons and annual throughput of 410,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(14) Tank 203: storing asphalt emulsion, constructed in 1975, with a storage capacity of 42,529 gallons and annual throughput of 10,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(15) Tank 204: storing asphalt emulsion, constructed in 1975, with a storage capacity of 44,529 gallons and annual throughput of 10,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(16) Tank 205: storing asphalt emulsion and cutback emulsion, constructed in 2003, with a storage capacity of 40,304 gallons and annual throughput of 9,460,000 gallons per year, with a diameter of 14.0 feet and height of 35.0 feet, and a true vapor pressure less than 0.5 psi.

(17) Tank 206: storing asphalt emulsion and cutback emulsion, constructed in 2003, with a storage capacity of 40,304 gallons and annual throughput of 9,460,000 gallons per year, with a diameter of 14.0 feet and height of 35.0 feet, and a true vapor pressure less than 0.5 psi.

(18) Tank 207: storing asphalt emulsion, constructed in 1975, with a storage capacity of 65,179 gallons and annual throughput of 15,298,700 gallons per year, with a diameter of 21.5 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(19) Tank 208: storing asphalt emulsion, constructed in 1975, with a storage capacity of 65,179 gallons and annual throughput of 15,298,700 gallons per year, with a diameter of 21.5 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(20) Tank 209: storing asphalt emulsion, constructed in 1975, with a storage capacity of 124,127 gallons and annual throughput of 29,134,800 gallons per year, with a diameter of 29.67 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(21) Tank 210: storing asphalt emulsion, constructed in 1975, with a storage capacity of 124,127 gallons and annual throughput of 29,134,800 gallons per year, with a diameter of 29.67 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(22) Tank 211: storing asphalt emulsion, constructed in 2008, with a storage capacity of 42,300 gallons and annual throughput of 9,928,800 gallons per year, with a diameter of 15.0 feet and height of 32 feet, and a true vapor pressure less than 0.5 psi.

(23) Tank 212: storing asphalt emulsion, constructed in 1986, with a storage capacity of 48,129 gallons and annual throughput of 11,296,800 gallons per year, with a diameter of 16.0 feet and height of 32.0 feet, and a true vapor pressure less than 0.5 psi.

(24) Tank 400: storing fuel oil, constructed in 1975, with a storage capacity of 20,080 gallons and annual throughput of 29,039,400 gallons per year, with a diameter of 10.5 feet and height of 31.0 feet, and a true vapor pressure less than 0.5 psi.

(25) Tank 401: storing LD-95, constructed in 1975, with a storage capacity of 10,364 gallons, with a diameter of 10.5 feet and height of 16.0 feet.

SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-1.1-1]

Terms in this registration shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-1.1-1) shall prevail.

B.2 Effective Date of Registration [IC 13-15-5-3]

Pursuant to IC 13-15-5-3, this registration is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

B.3 Registration Revocation [326 IAC 2-1.1-9]

Pursuant to 326 IAC 2-1.1-9 (Revocation), this registration to operate may be revoked for any of the following causes:

(a) Violation of any conditions of this registration.

(b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this registration.

(c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this registration shall not require revocation of this registration.

(d) For any cause which establishes in the judgment of IDEM, the fact that continuance of this registration is not consistent with purposes of this article.

B.4 Prior Permits Superseded [326 IAC 2-1.1-9.5]

(a) All terms and conditions of permits established prior to Registration No. 085-16440-00066 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised, or

(3) deleted.

(b) All previous registrations and permits are superseded by this registration.

B.5 Annual Notification [326 IAC 2-5.1-2(f)(3)] [326 IAC 2-5.5-4(a)(3)]

Pursuant to 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3):

(a) An annual notification shall be submitted by an authorized individual to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this registration.

(b) The annual notice shall be submitted in the format attached no later than March 1 of each year to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality

100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, IN 46204-2251

(c) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

B.6 Source Modification Requirement [326 IAC 2-5.5-6(a)]

Pursuant to 326 IAC 2-5.5-6(a), an application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

B.7 Registrations [326 IAC 2-5.1-2(i)]

Pursuant to 326 IAC 2-5.1-2(i), this registration does not limit the source's potential to emit.

SECTION C SOURCE OPERATION CONDITIONS

Entire Source

Emission Limitations and Standards [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]

C.1 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this registration:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.2 Fugitive Dust Emissions [326 IAC 6-4]

The Registrant shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

SECTION D.1 OPERATION CONDITIONS

Facility Description [326 IAC 2-5.1-2(f)(2)] [326 IAC 2-5.5-4(a)(2)]:

(a) One (1) boiler, fueled by natural gas only, identified as B-1, heat capacity is 5.02 mmBtu per hour. Stack height is 15 feet with a diameter of 24 inches.

(b) One (1) hot water heater, fueled by natural gas only, identified as WH-1, heat capacity is 3.0 mmBtu per hour. Two (2) stacks, each has a height of 13 feet and a diameter of 16 inches.

(c) One (1) hot oil heater, fueled by natural gas only, identified as HO-1, heat capacity is 8.4 mmBtu per hour. Stack height is 15 feet with a diameter of 24 inches.

(d) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-1, heat capacity is 1.25 mmBtu per hour. Stack height is 22 feet with a diameter of 10.75 inches.

(e) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-2, heat capacity is 1.72 mmBtu per hour. Stack height is 33 feet with a diameter of 10.75 inches.

(f) One (1) direct-fire immersion heater, fueled by natural gas only, identified as IM-3, heat capacity is 1.72 mmBtu per hour. Stack height is 33 feet with a diameter of 10.75 inches.

(g) One (1) loading rack, product name is asphalt, truck rack throughput is 18,000 gallons per hour.

(h) One (1) loading rack, product name is asphalt and polymer modified asphalt, truck rack annual throughput is 18,000 gallons per hour.

(i) Three (3) emulsion loading racks, identified as 1, 2, 3, each having a throughput of 18,000 gallons per hour.

(j) One (1) emulsion loading rack, identified as 4, having a throughput of 12,000 gallons per hour.

(k) Storage Tanks:

(1) Tank 101: storing asphalt cement, constructed in 1976, with a storage capacity of 20,080 gallons and annual throughput of 1,547,800 gallons per year, with a diameter of 10.5 feet and height of 31.0 feet, and a true vapor pressure less than 0.5 psi.

(2) Tank 102: storing asphalt cement, constructed in 1976, with a storage capacity of 82,751 gallons and annual throughput of 7,717,000 gallons per year, with a diameter of 29.67 feet and height of 16.0 feet, and a true vapor pressure less than 1.0 psi.

(3) Tank 103: storing asphalt cement, constructed in 1976, with a storage capacity of 82,751 gallons and annual throughput of 7,717,000 gallons per year, with a diameter of 29.67 feet and height of 16.0 feet, and a true vapor pressure less than 1.0 psi.

(4) Tank 104: storing asphalt cement, constructed in 1992, with a storage capacity of 168,000 gallons and annual throughput of 13,343,000 gallons per year, with a diameter of 29.89 feet and height of 32.0 feet, and a true vapor pressure less than 0.5 psi.

(5) Tank 105: storing asphalt cement, constructed in 1978, with a storage capacity of 489,002 gallons and annual throughput of 38,847,000 gallons per year, with a diameter of 51.0 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(6) Tank 106: storing asphalt cement, constructed in 1980, with a storage capacity of 489,002 gallons and annual throughput of 38,847,000 gallons per year, with a diameter of 51.0 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(7) Tank 107: storing asphalt cement, constructed in 1975, with a storage capacity of 24,614 gallons and annual throughput of 1,955,000 gallons per year, with a diameter of 10.5 feet and height of 38.0 feet, and a true vapor pressure less than 0.5 psi.

(8) Tank 108: storing asphalt cement, constructed in 2001, with a storage capacity of 4,219,783 gallons, with a diameter of 134 feet and height of 40 feet, and a true vapor pressure less than 0.5 psi.

(9) Tank 120: storing asphalt cement, constructed in 1982, with a storage capacity of 24,614 gallons and annual throughput of 15,434,300 gallons per year, with a diameter of 10.5 feet and height of 38.0 feet, and a true vapor pressure less than 0.5 psi.

(10) Tank 300: storing molten sulfur tank, constructed in 2004, with storage capacity of 5,264 gallons.

(11) Tank 150: storing asphalt cement batch, constructed in 1982, with a storage capacity of 24,065 gallons and annual throughput of 15,434,300 gallons per year, with a diameter of 16.0 feet and height of 16.0 feet, and a true vapor pressure less than 0.2 psi.

(12) Tank 201: storing asphalt emulsion, constructed in 1975, with a storage capacity of 44,529 gallons and annual throughput of 10,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(13) Tank 202: storing asphalt emulsion, constructed in 1975, with a storage capacity of 44,529 gallons and annual throughput of 410,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(14) Tank 203: storing asphalt emulsion, constructed in 1975, with a storage capacity of 42,529 gallons and annual throughput of 10,451,850 gallons per year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(15) Tank 204: storing asphalt emulsion, constructed in 1975, with a storage capacity of 44,529 gallons and annual throughput of 10,451,850 gallons per

year, with a diameter of 15.39 feet and height of 32.0 feet, and a true vapor pressure less than 1.0 psi.

(16) Tank 205: storing asphalt emulsion and cutback emulsion, constructed in 2003, with a storage capacity of 40,304 gallons and annual throughput of 9,460,000 gallons per year, with a diameter of 14.0 feet and height of 35.0 feet, and a true vapor pressure less than 0.5 psi.

(17) Tank 206: storing asphalt emulsion and cutback emulsion, constructed in 2003, with a storage capacity of 40,304 gallons and annual throughput of 9,460,000 gallons per year, with a diameter of 14.0 feet and height of 35.0 feet, and a true vapor pressure less than 0.5 psi.

(18) Tank 207: storing asphalt emulsion, constructed in 1975, with a storage capacity of 65,179 gallons and annual throughput of 15,298,700 gallons per year, with a diameter of 21.5 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(19) Tank 208: storing asphalt emulsion, constructed in 1975, with a storage capacity of 65,179 gallons and annual throughput of 15,298,700 gallons per year, with a diameter of 21.5 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(20) Tank 209: storing asphalt emulsion, constructed in 1975, with a storage capacity of 124,127 gallons and annual throughput of 29,134,800 gallons per year, with a diameter of 29.67 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(21) Tank 210: storing asphalt emulsion, constructed in 1975, with a storage capacity of 124,127 gallons and annual throughput of 29,134,800 gallons per year, with a diameter of 29.67 feet and height of 24.0 feet, and a true vapor pressure less than 1.0 psi.

(22) Tank 211: storing asphalt emulsion, constructed in 2008, with a storage capacity of 42,300 gallons and annual throughput of 9,928,800 gallons per year, with a diameter of 15.0 feet and height of 32 feet, and a true vapor pressure less than 0.5 psi.

(23) Tank 212: storing asphalt emulsion, constructed in 1986, with a storage capacity of 48,129 gallons and annual throughput of 11,296,800 gallons per year, with a diameter of 16.0 feet and height of 32.0 feet, and a true vapor pressure less than 0.5 psi.

(24) Tank 400: storing fuel oil, constructed in 1975, with a storage capacity of 20,080 gallons and annual throughput of 29,039,400 gallons per year, with a diameter of 10.5 feet and height of 31.0 feet, and a true vapor pressure less than 0.5 psi.

(25) Tank 401: storing LD-95, constructed in 1975, with a storage capacity of 10,364 gallons, with a diameter of 10.5 feet and height of 16.0 feet.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-5.1-2(f)(1)] [326 IAC 2-5.5-4(a)(1)]

D.1.1 Asphalt Paving [326 IAC 8-5-2]

The source shall not cause or allow the use of cutback asphalt or asphalt emulsion containing more than seven percent (7%) oil distillate by volume of emulsion as determined by ASTM D244-80a "Emulsific Asphalts" ASTM part 15, 1981 ASTM 1916 Race St., Philadelphia, PA 19103, Library of Congress Card Catalog #40-10712, for any paving application except as used for the following purposes:

(1) penetrating prime coating;
(2) stockpile storage; and
(3) application during the months of November, December, January, February, and March.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE BRANCH

REGISTRATION
ANNUAL NOTIFICATION

This form should be used to comply with the notification requirements under 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3).

Company Name:	**SemMaterials, L.P.**
Address:	**2820 East Durbin Street**
City:	**Warsaw, Indiana 46580**
Phone Number:	**(563) 584-1893**
Registration No.:	**No. 085-16440-00066**

I hereby certify that **SemMaterials, L.P.** is :	☐ still in operation.
	☐ no longer in operation.
I hereby certify that **SemMaterials, L.P.** is :	☐ in compliance with the requirements of Registration No. 085-16440-00066.
	☐ not in compliance with the requirements of Registration No. 085-16440-00066.

Authorized Individual (typed):
Title:
Signature:
Phone Number:
Date:

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

Noncompliance:

Applendix A

SemMaterial, L.P.

R 085-27367-00066

SemMaterials, L.P.

POTENTIAL-TO-EMIT (PTE)

SOURCE	NOx	CO	PM	PM10	PM2.5	VOC	SO2	Lead	HAPs
Natural Gas Combustion	9.0649	7.6145	0.6889	0.6889	0.6889	0.4986	0.0544	0.0000	0.1711
Storage Tanks	-	-	0.1750	-	-	8.4127	-	-	0.1270
Loading	-	-	0.2977	-	-	14.3128	-	-	0.2335
Equipment Fugitives	-	-	0.0015	-	-	0.0728	-	-	0.0012
Road Fugitives	-	-	23.5988	4.6047	-	-	-	-	-
PLANT-WIDE TOTALS (TPY)	**9.06**	**7.61**	**24.76**	**5.29**	**0.58**	**23.30**	**5.44E-02**	**4.53E-05**	**5.33E-01**

SemMaterials, L.P.

AIR EMISSION ESTIMATIONS

US EPA Formulas from AP-42*

	Tank Identification	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**120**	**150**	**201**	**202**
Coef	Contents of Tank	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	CB	CB
Type	Tank Type (Vertical or Horizontal)	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Heat	Heated (Yes or No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Di	Diameter, ft	10.5	29.7	29.7	29.9	51.0	51.0	10.5	134.0	10.5	16.0	15.4	15.4
D	Effective Diameter, ft	10.5	29.7	29.7	29.9	51.0	51.0	10.5	134.0	10.5	16.0	15.4	15.4
Hs	Shell Height or Length, ft	31.0	16.0	16.0	32.0	32.0	32.0	38.0	40.0	38.0	16.0	32.0	32.0
Cn	Nominal Capacity, gal	20,079.9	82,751.4	82,751.4	167,966.4	489,002.2	489,002.2	24,614.0	4,219,782.8	24,614.0	24,064.7	44,529.5	44,529.5
Cg	Geometric Capacity, gal	20,080	82,751	82,751	167,966	489,002	489,002	24,614	4,219,783	24,614	24,065	44,529	44,529
Qg	Throughput, gallons/yr	1,595,157.3	7,717,142.5	7,717,142.5	13,343,354.9	38,846,648.9	38,846,648.9	1,955,354.1	###########	15,434,285.0	15,434,285.0	10,451,849.6	10,451,849.6
Hl	Average Liquid Height, ft (def. = Shell Height/2)	15.50	8.00	8.00	16.00	16.00	16.00	19.00	20.00	19.00	8.00	16.00	16.00
Hlx	Maximum Liquid Height, ft (def. = Shell Height)	31.0	16.0	16.0	32.0	32.0	32.0	38.0	40.0	38.0	16.0	32.0	32.0
Tr	Roof Type (Cone or Dome)	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone
Sr	Tank Roof Cone Slope, ft/ft (def. = 0.0625)	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Rr	Dome Tank Roof Radius, ft (def. = shell diameter)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hrd	Dome Tank Roof Height, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hro	Roof Outage, ft	0.109	0.309	0.309	0.311	0.531	0.531	0.109	1.396	0.109	0.167	0.160	0.160
Hvo	Vapor Space Outage, ft	15.61	8.31	8.31	16.31	16.53	16.53	19.11	21.40	19.11	8.17	16.16	16.16
Vv	Vapor Space Volume, ft^3	1352	5745	5745	11445	33770	33770	1655	301737	1655	1642	3006	3006
Tan	Daily Minimum Liquid Temperature, F	300.0	325.0	325.0	300.0	300.0	300.0	300.0	300.0	350.0	350.0	170.0	170.0
Tax	Daily Maximum Liquid Temperature, F	340.0	375.0	375.0	340.0	340.0	340.0	340.0	340.0	350.0	425.0	200.0	200.0
Taa	Daily Average Liquid Temperature, F	320.0	350.0	350.0	320.0	320.0	320.0	320.0	320.0	350.0	387.5	185.0	185.0
I	Daily Total Solar Insulation Factor, Btu/ft^2/day	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203
alpha	Tank Paint Solar Absorbence, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DTv	Daily Vapor Temperature Range, R	34.5	41.7	41.7	34.5	34.5	34.5	34.5	34.5	5.7	59.7	27.3	27.3
Tla	Daily Average Liquid Surf. Temperature, F	320.0	350.0	350.0	320.0	320.0	320.0	320.0	320.0	350.0	387.5	185.0	185.0
Tln	Daily Minimum Liquid Surf. Temperature, F	300.0	325.0	325.0	300.0	300.0	300.0	300.0	300.0	350.0	350.0	170.0	170.0
Tlx	Daily Maximum Liquid Surf. Temperature, F	340.0	375.0	375.0	340.0	340.0	340.0	340.0	340.0	350.0	425.0	200.0	200.0
Tb	Liquid Bulk Temperature	320.0	350.0	350.0	320.0	320.0	320.0	320.0	320.0	350.0	387.5	185.0	185.0
Ts	Type of Substance (Organic or Petroleum)	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC
Mv	Vapor Molecular Weight, lb/lbmol	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	109.3	109.3
Aa	Antoine's Coefficient A	75350.0600	75350.0600	75350.0600	75350.0600	75350.0600	75350.0600	75350.0600	75350.0600	75350.0600	75350.0600	NA	NA
Ab	Antoine's Coefficient B	9.0035	9.0035	9.0035	9.0035	9.0035	9.0035	9.0035	9.0035	9.0035	9.0035	NA	NA
Ac	Antoine's Coefficient C	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	NA	NA
Pva	Vapor Pressure at Avg. Liq. Surf. Temp., psia	0.01588	0.03449	0.03449	0.01588	0.01588	0.01588	0.01588	0.01588	0.03449	0.08419	0.03092	0.03092
Pvn	Vapor Pressure at Min. Liquid Surf. Temp., psia	0.0092	0.0181	0.0181	0.0092	0.0092	0.0092	0.0092	0.0092	0.0345	0.0345	0.0309	0.0309
Pvx	Vapor Pressure at Max. Liquid Surf. Temp., psia	0.0268	0.0631	0.0631	0.0268	0.0268	0.0268	0.0268	0.0268	0.0345	0.1905	0.0309	0.0309
Wv	Vapor Density, lb/ft^3	0.00020	0.00042	0.00042	0.00020	0.00020	0.00020	0.00020	0.00020	0.00042	0.00097	0.00049	0.00049
DPv	Daily Vapor Pressure range, psi	0.0177	0.0449	0.0449	0.0177	0.0177	0.0177	0.0177	0.0177	0.0000	0.1560	0.0000	0.0000
Pbp	Breather Vent Pressure Setting, psig (def. = 0.03) Heated & Open Vent Tanks (Pbp = 0.0)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pbv	Breather Vent Vacuum Setting, psig (def. = -0.03) Heated & Open Vent Tanks (Pbp = 0.0)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DPb	Breather Vent Pressure Setting Range, psi	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pa	Ambient Pressure, psia (def. = 14.7)	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Ke	Vapor Space Expansion Factor	0.0455	0.0547	0.0547	0.0455	0.0455	0.0455	0.0455	0.0455	0.0071	0.0815	0.0424	0.0424
Ks	Vented Vapor Saturation Factor	0.987	0.985	0.985	0.986	0.986	0.986	0.984	0.982	0.966	0.965	0.974	0.974
FRx	Maximum Fill Rate (gpm)	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0
N	Annual Turnovers	79.4	93.3	93.3	79.4	79.4	79.4	79.4	79.4	627.1	641.4	234.7	234.7
Kn	Turnover Factor	0.54	0.49	0.49	0.54	0.54	0.54	0.54	0.54	0.21	0.21	0.29	0.29
Kp	Working Loss Product Factor (def.=1)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
L_S	**Standing Storage Loss, lbs/yr**	**4.42**	**47.08**	**47.08**	**37.38**	**110.28**	**110.28**	**5.39**	**981.37**	**1.72**	**45.80**	**22.12**	**22.12**
L_W	**Working Loss, lbs/yr**	**34.47**	**324.99**	**324.99**	**288.34**	**839.45**	**839.45**	**42.25**	**7,243.92**	**285.50**	**693.39**	**247.54**	**247.54**
L_T	**Total Losses, lbs/yr**	**38.89**	**372.07**	**372.07**	**325.72**	**949.73**	**949.73**	**47.65**	**8,225.29**	**287.22**	**739.19**	**269.66**	**269.66**
L_{MH}	**Maximum Hourly Loss, lbs/hr**	**0.01**	**0.03**	**0.03**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.04**	**0.01**	**0.01**
EF_{SL}	Standing Loss EF, lb/1000 gal capacity	0.22	0.57	0.57	0.22	0.23	0.23	0.22	0.23	0.07	1.90	0.50	0.50
EF_{WL}	Working Loss EF, lb/1000 gal throughput	0.02	0.04	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.02
EF_{MH}	Maximum Loss EF, lb/1000 gal throughput	2.19	4.62	4.62	2.19	2.19	2.19	2.19	2.19	1.11	6.10	1.42	1.42

SemMaterials, L.P.

AIR EMISSION ESTIMATIONS

US EPA Formulas from AP-42*

	Tank Identification	**203**	**204**	**205**	**206**	**207**	**208**	**209**	**210**	**211**	**212**	**301**	**302**	**303**	**304**	**305**	**306**
Coef	Contents of Tank	CB	CB	CB	CB	CB	CB	CB	CB	CB	CB	NA	NA	NA	NA	NA	NA
Type	Tank Type (Vertical or Horizontal)	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Heat	Heated (Yes or No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Di	Diameter, ft	15.4	15.4	14.0	14.0	21.5	21.5	29.7	29.7	15.0	16.0	10.5	10.5	10.5	10.5	15.4	10.5
D	Effective Diameter, ft	15.4	15.4	14.0	14.0	21.5	21.5	29.7	29.7	15.0	16.0	10.5	10.5	10.5	10.5	15.4	10.5
Hs	Shell Height or Length, ft	32.0	32.0	35.0	35.0	24.0	24.0	24.0	24.0	32.0	32.0	31.0	31.0	31.0	31.0	32.0	16.0
Cn	Nominal Capacity, gal	44,529.5	44,529.5	40,303.7	40,303.7	65,179.1	65,179.1	124,127.2	124,127.2	42,301.2	48,129.4	20,079.9	20,079.9	20,079.9	20,079.9	44,529.5	10,363.8
Cg	Geometric Capacity, gal	44,529	44,529	40,304	40,304	65,179	65,179	124,127	124,127	42,301	48,129	20,080	20,080	20,080	20,080	44,529	10,364
Qg	Throughput, gallons/yr	10,451,849.6	10,451,849.6	9,459,976.3	9,459,976.3	15,298,684.7	15,298,684.7	29,134,815.1	29,134,815.1	9,928,838.1	11,296,811.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Hl	Average Liquid Height, ft (def. = Shell Height/2)	16.00	16.00	17.50	17.50	12.00	12.00	12.00	12.00	16.00	16.00	15.50	15.50	15.50	15.50	16.00	8.00
Hlx	Maximum Liquid Height, ft (def. = Shell Height)	32.0	32.0	35.0	35.0	24.0	24.0	24.0	24.0	32.0	32.0	31.0	31.0	31.0	31.0	32.0	16.0
Tr	Roof Type (Cone or Dome)	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone
Sr	Tank Roof Cone Slope, ft/ft (def. = 0.0625)	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Rr	Dome Tank Roof Radius, ft (def. = shell diameter)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hrd	Dome Tank Roof Height, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hro	Roof Outage, ft	0.160	0.160	0.146	0.146	0.224	0.224	0.309	0.309	0.156	0.167	0.109	0.109	0.109	0.109	0.160	0.109
Hvo	Vapor Space Outage, ft	16.16	16.16	17.65	17.65	12.22	12.22	12.31	12.31	16.16	16.17	15.61	15.61	15.61	15.61	16.16	8.11
Vv	Vapor Space Volume, ft^3	3006	3006	2716	2716	4438	4438	8510	8510	2855	3251	1352	1352	1352	1352	3006	702
Tan	Daily Minimum Liquid Temperature, F	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	40.5	40.5	40.5	40.5	40.5	40.5
Tax	Daily Maximum Liquid Temperature, F	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	58.5	58.5	58.5	58.5	58.5	58.5
Taa	Daily Average Liquid Temperature, F	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	49.5	49.5	49.5	49.5	49.5	49.5
I	Daily Total Solar Insulation Factor, Btu/ft^2/day	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203
alpha	Tank Paint Solar Absorbence, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DTv	Daily Vapor Temperature Range, R	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	18.7	18.7	18.7	18.7	18.7	18.7
Tla	Daily Average Liquid Surf. Temperature, F	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	49.5	49.5	49.5	49.5	49.5	49.5
Tln	Daily Minimum Liquid Surf. Temperature, F	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	40.5	40.5	40.5	40.5	40.5	40.5
Tlx	Daily Maximum Liquid Surf. Temperature, F	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	58.5	58.5	58.5	58.5	58.5	58.5
Tb	Liquid Bulk Temperature	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	185.0	49.5	49.5	49.5	49.5	49.5	49.5
Ts	Type of Substance (Organic or Petroleum)	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	ORGANIC	*	*	*	*	*	*
Mv	Vapor Molecular Weight, lb/lbmol	109.3	109.3	109.3	109.3	109.3	109.3	109.3	109.3	109.3	109.3	*	*	*	*	*	*
Aa	Antoine's Coefficient A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*	*	*	*	*	*
Ab	Antoine's Coefficient B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*	*	*	*	*	*
Ac	Antoine's Coefficient C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*	*	*	*	*	*
Pva	Vapor Pressure at Avg. Liq. Surf. Temp., psia	0.03092	0.03092	0.03092	0.03092	0.03092	0.03092	0.03092	0.03092	0.03092	0.03092	*	*	*	*	*	*
Pvn	Vapor Pressure at Min. Liquid Surf. Temp., psia	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	*	*	*	*	*	*
Pvx	Vapor Pressure at Max. Liquid Surf. Temp., psia	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	0.0309	*	*	*	*	*	*
Wv	Vapor Density, lb/ft^3	0.00049	0.00049	0.00049	0.00049	0.00049	0.00049	0.00049	0.00049	0.00049	0.00049	*	*	*	*	*	*
DPv	Daily Vapor Pressure range, psi	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	*	*	*	*	*	*
Pbp	Breather Vent Pressure Setting, psig (def. = 0.03) Heated & Open Vent Tanks (Pbp = 0.0)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pbv	Breather Vent Vacuum Setting, psig (def. = -0.03) Heated & Open Vent Tanks (Pbp = 0.0)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DPb	Breather Vent Pressure Setting Range, psi	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pa	Ambient Pressure, psia (def. = 14.7)	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Ke	Vapor Space Expansion Factor	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	*	*	*	*	*	*
Ks	Vented Vapor Saturation Factor	0.974	0.974	0.972	0.972	0.980	0.980	0.980	0.980	0.974	0.974	*	*	*	*	*	*
FRx	Maximum Fill Rate (gpm)	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	300.0	300.0	300.0	300.0	300.0	300.0
N	Annual Turnovers	234.7	234.7	234.7	234.7	234.7	234.7	234.7	234.7	234.7	234.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Kn	Turnover Factor	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Kp	Working Loss Product Factor (def.=1)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
L_S	**Standing Storage Loss, lbs/yr**	**22.12**	**22.12**	**19.94**	**19.94**	**32.87**	**32.87**	**63.02**	**63.02**	**21.01**	**23.92**	*	*	*	*	*	*
L_W	**Working Loss, lbs/yr**	**247.54**	**247.54**	**224.04**	**224.04**	**362.33**	**362.33**	**690.01**	**690.01**	**235.15**	**267.55**	*	*	*	*	*	*
L_T	**Total Losses, lbs/yr**	**269.66**	**269.66**	**243.99**	**243.99**	**395.19**	**395.19**	**753.03**	**753.03**	**256.16**	**291.47**	*	*	*	*	*	*
L_{MH}	**Maximum Hourly Loss, lbs/hr**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	*	*	*	*	*	*
EF_{SL}	Standing Loss EF, lb/1000 gal capacity	0.50	0.50	0.49	0.49	0.50	0.50	0.51	0.51	0.50	0.50	*	*	*	*	*	*
EF_{WL}	Working Loss EF, lb/1000 gal throughput	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	*	*	*	*	*	*
EF_{MH}	Maximum Loss EF, lb/1000 gal throughput	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	*	*	*	*	*	*

SemMaterials, L.P.

AIR EMISSION ESTIMATIONS

US EPA Formulas from AP-42*

	Tank Identification	**340**	**341**	**400**	**401**	**410**	**500**	**501**	**520**	**521**	**530**	
Coef	Contents of Tank	NA	NA	DISTILLATE	NA	NA	NA	NA	NA	NA	NA	
Type	Tank Type (Vertical or Horizontal)	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	
Heat	Heated (Yes or No)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Di	Diameter, ft	10.5	10.5	10.5	10.5	10.5	8.0	8.0	5.3	6.0	10.5	
D	Effective Diameter, ft	10.5	10.5	10.5	10.5	10.5	8.0	8.0	5.3	6.0	10.5	
Hs	Shell Height or Length, ft	32.0	32.0	31.0	16.0	16.0	22.0	22.0	6.0	6.0	20.0	
Cn	Nominal Capacity, gal	20,727.6	20,727.6	20,079.9	10,363.8	10,363.8	8,272.2	8,272.2	971.6	1,269.0	12,954.8	
Cg	Geometric Capacity, gal	20,728	20,728	20,080	10,364	10,364	8,272	8,272	972	1,269	12,955	
Qg	Throughput, gallons/yr	#N/A	#N/A	29,039,400.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Hl	Average Liquid Height, ft (def. = Shell Height/2)	16.00	16.00	15.50	8.00	8.00	11.00	11.00	3.00	3.00	10.00	
Hlx	Maximum Liquid Height, ft (def. = Shell Height)	32.0	32.0	31.0	16.0	16.0	22.0	22.0	6.0	6.0	20.0	
Tr	Roof Type (Cone or Dome)	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	Cone	
Sr	Tank Roof Cone Slope, ft/ft (def. = 0.0625)	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	
Rr	Dome Tank Roof Radius, ft (def. = shell diameter)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hrd	Dome Tank Roof Height, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hro	Roof Outage, ft	0.109	0.109	0.109	0.109	0.109	0.083	0.083	0.055	0.063	0.109	
Hvo	Vapor Space Outage, ft	16.11	16.11	15.61	8.11	8.11	11.08	11.08	3.05	3.06	10.11	
Vv	Vapor Space Volume, ft^3	1395	1395	1352	702	702	557	557	66	87	875	
Tan	Daily Minimum Liquid Temperature, F	40.5	40.5	40.5	40.5	40.5	150.0	150.0	150.0	150.0	150.0	
Tax	Daily Maximum Liquid Temperature, F	58.5	58.5	58.5	58.5	58.5	200.0	200.0	200.0	200.0	200.0	
Taa	Daily Average Liquid Temperature, F	49.5	49.5	49.5	49.5	49.5	175.0	175.0	175.0	175.0	175.0	
I	Daily Total Solar Insulation Factor, Btu/ft^2/day	1203	1203	1203	1203	1203	1203	1203	1203	1203	1203	
alpha	Tank Paint Solar Absorbence, dimensionless	0.170	0.170	0.680	0.170	0.170	0.170	0.170	0.170	0.170	0.170	
DTv	Daily Vapor Temperature Range, R	18.7	18.7	35.9	18.7	18.7	41.7	41.7	41.7	41.7	41.7	
Tla	Daily Average Liquid Surf. Temperature, F	49.5	49.5	57.7	49.5	49.5	175.0	175.0	175.0	175.0	175.0	
Tln	Daily Minimum Liquid Surf. Temperature, F	40.5	40.5	48.7	40.5	40.5	150.0	150.0	150.0	150.0	150.0	
Tlx	Daily Maximum Liquid Surf. Temperature, F	58.5	58.5	66.7	58.5	58.5	200.0	200.0	200.0	200.0	200.0	
Tb	Liquid Bulk Temperature	49.5	49.5	52.6	49.5	49.5	175.0	175.0	175.0	175.0	175.0	
Ts	Type of Substance (Organic or Petroleum)	*	*	ORGANIC	*	*	*	*	*	*	*	
Mv	Vapor Molecular Weight, lb/lbmol	*	*	130.0	*	*	*	*	*	*	*	
Aa	Antoine's Coefficient A	*	*	5.7473	*	*	*	*	*	*	*	
Ab	Antoine's Coefficient B	*	*	1498.8920	*	*	*	*	*	*	*	
Ac	Antoine's Coefficient C	*	*	225.5890	*	*	*	*	*	*	*	
Pva	Vapor Pressure at Avg. Liq. Surf. Temp., psia	*	*	0.00609	*	*	*	*	*	*	*	
Pvn	Vapor Pressure at Min. Liquid Surf. Temp., psia	*	*	0.0045	*	*	*	*	*	*	*	
Pvx	Vapor Pressure at Max. Liquid Surf. Temp., psia	*	*	0.0082	*	*	*	*	*	*	*	
Wv	Vapor Density, lb/ft^3	*	*	0.00014	*	*	*	*	*	*	*	
DPv	Daily Vapor Pressure range, psi	*	*	0.0037	*	*	*	*	*	*	*	
Pbp	Breather Vent Pressure Setting, psig (def. = 0.03) Heated & Open Vent Tanks (Pbp = 0.0)	0.0000	0.0000	0.0300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Pbv	Breather Vent Vacuum Setting, psig (def. = -0.03) Heated & Open Vent Tanks (Pbp = 0.0)	0.0000	0.0000	-0.0300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
DPb	Breather Vent Pressure Setting Range, psi	0.0000	0.0000	0.0600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Pa	Ambient Pressure, psia (def. = 14.7)	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	
Ke	Vapor Space Expansion Factor	*	*	0.0654	*	*	*	*	*	*	*	
Ks	Vented Vapor Saturation Factor	*	*	0.995	*	*	*	*	*	*	*	
FRx	Maximum Fill Rate (gpm)	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	
N	Annual Turnovers	#N/A	#N/A	1446.2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Kn	Turnover Factor	#N/A	#N/A	0.19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Kp	Working Loss Product Factor (def.=1)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	**TOTALS**
L_S	**Standing Storage Loss, lbs/yr**	*	*	**4.58**	*	*	*	*	*	*	*	**1,760.46**
L_W	**Working Loss, lbs/yr**	*	*	**102.66**	*	*	*	*	*	*	*	**15,065.02**
L_T	**Total Losses, lbs/yr**	*	*	**107.24**	*	*	*	*	*	*	*	**16,825.49**
L_{MH}	**Maximum Hourly Loss, lbs/hr**	*	*	**0.00**	*	*	*	*	*	*	*	**0.31**
EF_{SL}	Standing Loss EF, lb/1000 gal capacity	*	*	0.23	*	*	*	*	*	*	*	
EF_{WL}	Working Loss EF, lb/1000 gal throughput	*	*	0.00	*	*	*	*	*	*	*	
EF_{MH}	Maximum Loss EF, lb/1000 gal throughput	*	*	0.28	*	*	*	*	*	*	*	

SemMaterials, L.P.

AIR EMISSION ESTIMATIONS

US EPA Formulas from AP-42*

	Tank Identification
Coef	Contents of Tank
Type	Tank Type (Vertical or Horizontal)
Heat	Heated (Yes or No)
Di	Diameter, ft
D	Effective Diameter, ft
Hs	Shell Height or Length, ft
Cn	Nominal Capacity, gal
Cg	Geometric Capacity, gal
Qg	Throughput, gallons/yr
Hl	Average Liquid Height, ft (def. = Shell Height/2)
Hlx	Maximum Liquid Height, ft (def. = Shell Height)
Tr	Roof Type (Cone or Dome)
Sr	Tank Roof Cone Slope, ft/ft (def. = 0.0625)
Rr	Dome Tank Roof Radius, ft (def. = shell diameter)
Hrd	Dome Tank Roof Height, ft
Hro	Roof Outage, ft
Hvo	Vapor Space Outage, ft
Vv	Vapor Space Volume, ft^3
Tan	Daily Minimum Liquid Temperature, F
Tax	Daily Maximum Liquid Temperature, F
Taa	Daily Average Liquid Temperature, F
I	Daily Total Solar Insulation Factor, Btu/ft^2/day
alpha	Tank Paint Solar Absorbence, dimensionless
DTv	Daily Vapor Temperature Range, R
Tla	Daily Average Liquid Surf. Temperature, F
Tln	Daily Minimum Liquid Surf. Temperature, F
Tlx	Daily Maximum Liquid Surf. Temperature, F
Tb	Liquid Bulk Temperature
Ts	Type of Substance (Organic or Petroleum)
Mv	Vapor Molecular Weight, lb/lbmol
Aa	Antoine's Coefficient A
Ab	Antoine's Coefficient B
Ac	Antoine's Coefficient C
Pva	Vapor Pressure at Avg. Liq. Surf. Temp., psia
Pvn	Vapor Pressure at Min. Liquid Surf. Temp., psia
Pvx	Vapor Pressure at Max. Liquid Surf. Temp., psia
Wv	Vapor Density, lb/ft^3
DPv	Daily Vapor Pressure range, psi
Pbp	Breather Vent Pressure Setting, psig (def. = 0.03) Heated & Open Vent Tanks (Pbp = 0.0)
Pbv	Breather Vent Vacuum Setting, psig (def. = -0.03) Heated & Open Vent Tanks (Pbp = 0.0)
DPb	Breather Vent Pressure Setting Range, psi
Pa	Ambient Pressure, psia (def. = 14.7)
Ke	Vapor Space Expansion Factor
Ks	Vented Vapor Saturation Factor
FRx	Maximum Fill Rate (gpm)
N	Annual Turnovers
Kn	Turnover Factor
Kp	Working Loss Product Factor (def.=1)
L_S	**Standing Storage Loss, lbs/yr**
L_W	**Working Loss, lbs/yr**
L_T	**Total Losses, lbs/yr**
L_{MH}	**Maximum Hourly Loss, lbs/hr**
EF_{SL}	Standing Loss EF, lb/1000 gal capacity
EF_{WL}	Working Loss EF, lb/1000 gal throughput
EF_{MH}	Maximum Loss EF, lb/1000 gal throughput

Total losses from fixed roof tanks (lb/yr) = Standing Storage Losses + Working Losses

Standing Storage Losses (lb/yr) = $365*V_V*W_V*K_E*K_S$

Where: V_V = vapor space volume, ft3

W_V = vapor density (lb/ft3)

K_E = vapor space expansion factor

K_S = vented vapor saturation factor

365 = constant, days per year

Working Losses (lb/yr) = $0.0010*M_V*P_{VA}*Q*K_N*K_P$

Where: molecular weight (lb/lbmole

P_{VA} = vapor pressure at daily average liquid surface temperature (psia)

Q = annual net throughput (bbl/yr)

K_N = turnover factor

K_P = working loss product factor

Standing Storage Losses (lb/yr) = $365*V_V*W_V*K_E*K_S$

Where: V_V = vapor space volume, ft3

W_V = vapor density (lb/ft3)

K_E = vapor space expansion factor

K_S = vented vapor saturation factor

365 = constant, days per year

Working Losses (lb/yr) = $0.0010*M_V*P_{VA}*Q*K_N*K_P$

Where: molecular weight (lb/lbmole

P_{VA} = vapor pressure at daily average liquid surface temperature (psia)

Q = annual net throughput (bbl/yr)

K_N = turnover factor

K_P = working loss product factor

Air Emissions for the aboveground storage tanks were estimated using the procedures described in Section 7.1.3.1 of the AP-42, Fifth Edition (revised September 1997) as approved by the U. S. Environmental Protection Agency.

** Equations for Fixed-Roof, Petroleum Products*
[U.S. EPA, "Compilation of Air Pollutant Emission Factors" (AP-42), September, 1997, section 7.1.3.1, equations 1-1, 1-2, 1-23]

SemMaterials, L.P.

Loading Emissions

	TRUCK LOADING				
			Emulsions		
PRODUCT NAME	**AC**	**PMAC**	**Non-Cutback**	**CB (Cutback Emulsion)**	
Product Specific Emission Factors:					
Loading Method (Mode of Operation):	Splash	Splash	Splash	Splash	
Saturation factor, S, from AP-42, Table 5.2-1:	1.45	1.45	1.45	1.45	
Temperature of the product being loaded (degrees F):	320	350	200	200	
Antoine's Coefficient A	75350.06	75350.06	75350.06	NA	
Antoine's Coefficient B	9.00346	9.00346	9.00346	NA	
Antoine's Coefficient C	0	0	0	NA	
True vapor pressure of the product being loaded (psia):	0.015880233	0.03449338	0.000352216	0.030918362	
Molecular weight of the product vapors (lb / lbmol):	105	105	105	109.25	
Loading Loss Emission Factor (lbs/mgal):	0.039	0.081	0.001	0.092	
Annual Throughput (gal/yr)*:	299,925,715	15,434,285	0	170,820,000	
VOC Emissions (lbs/yr):	11,583.81	1,246.85	0.00	15,794.97	
VOC Emissions (TPY):	5.79	0.62	0.00	7.90	**14.31 TOTAL**

* See Annual Throughput next page
Basis of Estimate: AP-42, Section 5.2, Equation (1)
Saturation Factor, S (from AP-42, Table 5.2-1)
Splash Loading, 1.45
Submerged Loading, 0.6
Submerged Loading Barges, 0.5

Note: Splash loading of AC and PMAC into trucks results in higher PTE of VOC than submerged loading of AC and PMAC into barges.

Assumption PM = 2.08% of VOC

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Facility Throughput

Estimate Based on a Comprehensive Potential-to-Emit

	Annual pte	Rationale for Annual Potential-To-Emit (PTE) Volume	Units	Logic
TRUCK UNLOADING				
AC Truck Unloaded (gal):	405,591,492	405,591,492	gal	AC demand based on product loading (Note 2)
Fuel Oil Unloaded (gal)	29,039,400	29,039,400	gal	Based on 17% of Cutback Emulsions
RAIL CAR UNLOADING				
AC Rail Car Unloaded (gal)	24,217,908	24,217,908	gal	6 railcars every other day (Note 1)
TRUCK LOADING				
Asphalt Cement (gal)	299,925,715	299,925,715	gal	2 racks; 3 trucks per hour per rack = 6 trucks per hour = 36,000 gal/hr minus PMAC volume
Asphalt Emulsion (gal)	0	0	gal	Assume all emulsion is Cutback Emulsion for worst case. Mill speed 19,500 gal per hr
CB (Cutback Emulsion) (gal)	170,820,000	170,820,000	gal	Assume all emulsion is Cutback Emulsion for worst case (Note 4)
PMAC (gal)	15,434,285	15,434,285	gal	1 rack; Limited by PMAC batch rate
COMBUSTION				
Natural Gas Usage-Heater (MMscf)	181.30	181	MMscf	See NG Combustion Tab

Methodology

(Note 1) Per Source, facility has 6 railcar unloading spots. A railcar takes 24 hours to heat up and 1 hour to pump empty. Bottleneck occurs because empty railcars are usually picked up the next day and replaced with new ones.

The railcar unloading (gal/yr) = approximately 22,000 lbs/day/railcar * 365 day/year * 1/2 * 6 railcars

AC truck unload (gal/yr) = AC truck load(gal) + [CB truck load(gal)*67%VOC]+PMAC truck load - AC rail car unload = 299925715+(170820000*.67) + 15434285 -24217908

Note 2 -- Per Source, facility has 4 truck AC unloading spots. Average pump rate is 350 gpm. With equipment hookup times, assume 3 trucks per hour per rack, at 6,000 gallons per truck. Total unloading capacity is 12 trucks per hour = 72,000 gal/hr.

AC Truck loading (gal/yr) = 2 racks * 3 truck per hour per rack * 6,000 gals per hour per truck * 8760 hour/yr minus PMAC truck loading = 2*3*6000*8760 - 15434285

Note 3 -- Per source, PMAC batch rate is 18,500 gallons every 10.5 hours. Breakdown as follows - 1.5 hrs to fill, 2.0 hrs to add polymer, 4.0 hrs to dissolve polymer, 2.0 hrs to transfer out, 1 hr react with sulfur. Therefore, PMAC truck loading (gal/yr) = 18,500 gal/10.5 hr * 8760 hr/yr.

Per source, CB truck loading (gal/yr) = mill spreed 19500 gal/hr * 8760 hr/yr.

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Fugitive VOC Emissions

Source Description	Source Count	Service	Emission Factor[c] (kg/hr/component)	Emission Factor[c] (lb/day/component)	VOC %	lbs/hr	lbs/day	lbs/yr	tons/yr
Connector	0	heavy oil (<20 API Gravity)	0.0000075	0.000396828	100.00%	0	0	0	0
Flange	1000	heavy oil (<20 API Gravity)	0.00000039	2.06351E-05	100.00%	0.00086	0.0206	7.511	0.00375558
Open-ended line	0	heavy oil (<20 API Gravity)	0.00014	0.007407456	100.00%	0	0	0	0
Other[a]	0	heavy oil (<20 API Gravity)	0.000032	0.001693133	100.00%	0	0	0	0
Pump[d]	50	heavy oil (<20 API Gravity)	0.0000763	0.004037064	100.00%	0.00841	0.2019	73.47	0.036737278
Valve	400	heavy oil (<20 API Gravity)	0.0000084	0.000444447	100.00%	0.00741	0.1778	64.71	0.032355768
					Totals:	**0.01668**	**0.4003**	**145.7**	**0.072848626**

[a]The "other" equipment type was derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents.
This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

[b]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[c]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production and off shore facilities.

[d]Not enough data was available to develop the indicated emission factor.
The factor was derived using the average ratio of light to heavy crude oil factors for all other components.

[e]Gas service is assumed to be 90% Methane and the remianing 10% is assumed to be VOC's.

Basis:
All Pipeline valves (3" and larger), flanges (3" and larger), compressor seals, and pumps.
All fugitive emissions from components less than 3 inches were assumed to be negligible.
Emission Factors were taken from "Average Emission Factors for Oil and Gas Production Operations"
The operation time used for the facility is: 24 hrs/day x 7 days/wk x 52 wks/yr OR 8760 hrs/yr

Note:
These calculations are taken from a copy of EPA "Protocol for Equipment Leak Emission Estimates" released in November 1995 for Oil & Gas Production.
These calculations serve as an estimate of the actual emissions and not emission limits (potential to emit).

Example Calculation:
VOC Emissions (lbs/hr) = (source count) x (VOC content, %) / (100) x (emission factor lbs/day/source) / (24 hrs/day)

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Paved Roadway Emissions

Input Data			Units	Source
	Total Volume Received:	434,630,892	gal	Date Entry tab
	Total Volume Shipped:	486,180,000	gal	Date Entry tab
	Total Volume Through Plant:	920,810,892	gal	Date Entry tab
	Average Truck Size (mgal):	6.5	mgal	
	Average distance traveled (miles/vehicle):	0.48	miles/vehicle	Facility Traffic Flow
	Trucks Per Year	141,663.21		
W	Vehicle Weight (tons):	26.50	tons	Average of 40 tons full and 13 tons empty
VMT	Vehicle miles traveled per year	67,998.34	miles	

Factor Calculation	PM	PM 10	PM 2.5
k - Particle size empirical constant, (dimensionless) (Table 13.2-1.1)	0.082	0.016	0.002
sL - Road Surface Silt Loading (g/m2)			
Based on December 10, 2002 Review (085-16640-00066)	0.4	0.4	0.4
W - Mean vehicle weight (tons):	26.5	26.5	26.5
N = Days in averaging period	365	365	365
E = k (sL/2)^0.65 (W/3)^1.5*(1-P/4N) (Equation 1)			
Size-specific emission factor, dry, (lb/VMT) (pg 13.2.1.3 Eq 1)	0.76	0.15	0.02
P = Number of days with at least 0.01 in of rain (Fig 13.2.2-1)	120	120	120
Emission factor adjusted for moisture, lb/VMT (pg 13.2.2-5)	**0.69**	**0.14**	**0.02**

Emissions Calculations

Annual Emissions	PM	PM 10	PM 2.5	
Emission Factor, lb/VMT (use moisture adjusted factor)	0.69	0.14	0.02	
Vehicle Miles Traveled, mile/yr	67,998	67,998	67,998	
Uncontrolled Emissions, lb/year (E x VMT)	47,198	9,209	1,151	
Uncontrolled Emissions, ton/year	**23.60**	**4.60**	**0.58**	
Control Type Claimed: None	0%	0%	0%	*Estimated Efficiency*
Estimated Emissions, lbs/year (E x VMT)	47,198	9,209	1,151	
Estimated Emissions, ton/year	**23.60**	**4.60**	**0.58**	
Maximum estimated hourly emission, lbs/hr (assume an 8hr day)	0.07	0.01	0.00	

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Natural Gas Combustion Emissions

Heater / Boiler ID	Manufacturer	Input Burner Size (MMBtu)	Maximum Potential Fuel Use (MMscf/yr)	Percent Usage*	Actual Fuel Use (MMscf/yr)	Date of Construction/ Modification	Basis fo Max Heat Input	NSPS Dc Source	NSPS Requirements
Steam Boiler	CB720-150	5.02	43.11294118	23.8%	43.11	1958	Boiler Plate	NA	Exempt, less than 10MmmBtu/hr
Industrial Water Heater	WGB-3000-S	3	25.76470588	14.2%	25.76	1987	Burner Plate	NA	Exempt, less than 10MmmBtu/hr
Hot Oil Heater	AHE-650	8.4	72.14117647	39.8%	72.14	2000	Owners Manual	NA	Exempt, less than 10MmmBtu/hr
TK105 Direct Fire Heater	T90-79-1	1.72	14.77176471	8.1%	14.77	1979	Burner Plate	NA	Exempt, less than 10MmmBtu/hr
TK106 Direct Fire Heater	T-329-79-1	1.72	14.77176471	8.1%	14.77	1979	Burner Plate	NA	Exempt, less than 10MmmBtu/hr
TK150 Direct Fire Heater	T-532-82-1	1.25	10.73529412	5.9%	10.74	1983	Burner Plate	NA	Exempt, less than 10MmmBtu/hr

* Percent Usage is caclulated assuming that all heaters operate an equal number of hours

TOTAL HEAT INPUT

Fuel Type	Natural Gas	
Total Heat Input	21.11	MMBtu/hr
Higher Heating Value of Fuel	1,020.0	Btu/scf
	Total	
Maximum Potential Fuel Use	181.30	MMscf/yr
Actual Fuel Use	181.30	MMscf/yr
Hours of Operation	8,760	hrs/yr

Combustion Products	Emission Factor		Emission Rate				Basis of Estimate
Criteria Pollutants							
Nitrogen Oxides	100	lbs/MMscf	2.069607843	lbs/hr	9.064882353	tpy	AP-42, Table 1.4-1 (7/98)
Carbon Monoxide	84	lbs/MMscf	1.738470588	lbs/hr	7.614501176	tpy	AP-42, Table 1.4-1 (7/98)
Particulate Matter	7.6	lbs/MMscf	0.157290196	lbs/hr	0.688931059	tpy	AP-42, Table 1.4-1 (7/98)
Non-methane VOC	5.5	lbs/MMscf	0.113828431	lbs/hr	0.498568529	tpy	AP-42, Table 1.4-1 (7/98)
Sulfur Dioxide	0.6	lbs/MMscf	0.012417647	lbs/hr	0.054389294	tpy	AP-42, Table 1.4-1 (7/98)
Lead	0.0005	lbs/MMscf	1.0348E-05	lbs/hr	4.53244E-05	tpy	AP-42, Table 1.4-1 (7/98)
Federal HAPs - Listed							
Arsenic	0.0002	lbs/MMscf	4.13922E-06	lbs/hr	1.81298E-05	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Benzene	0.0021	lbs/MMscf	4.34618E-05	lbs/hr	0.000190363	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Beryllium	0.000012	lbs/MMscf	2.48353E-07	lbs/hr	1.08779E-06	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Cadmium	0.0011	lbs/MMscf	2.27657E-05	lbs/hr	9.97137E-05	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Chromium	0.0014	lbs/MMscf	2.89745E-05	lbs/hr	0.000126908	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Cobalt	0.000084	lbs/MMscf	1.73847E-06	lbs/hr	7.6145E-06	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Dichlorobenzene	0.0012	lbs/MMscf	2.48353E-05	lbs/hr	0.000108779	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Formaldehyde	0.075	lbs/MMscf	0.001552206	lbs/hr	0.006798662	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Hexane	1.8	lbs/MMscf	0.037252941	lbs/hr	0.163167882	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Manganese	0.00038	lbs/MMscf	7.86451E-06	lbs/hr	3.44466E-05	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Mercury	0.00026	lbs/MMscf	5.38098E-06	lbs/hr	2.35687E-05	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Naphthalene	0.00061	lbs/MMscf	1.26246E-05	lbs/hr	5.52958E-05	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Nickel	0.0021	lbs/MMscf	4.34618E-05	lbs/hr	0.000190363	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Selenium	0.000024	lbs/MMscf	4.96706E-07	lbs/hr	2.17557E-06	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Toluene	0.0034	lbs/MMscf	7.03667E-05	lbs/hr	0.000308206	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Federal HAPs - POM/PAH							
2-Methylnaphthalene	0.000024	lbs/MMscf	4.96706E-07	lbs/hr	2.17557E-06	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
3-Methylchloranthrene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
7,12-Dimethylbenz(a)anthracene	0.000016	lbs/MMscf	3.31137E-07	lbs/hr	1.45038E-06	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Acenaphthene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Acenaphthylene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Anthracene	0.0000024	lbs/MMscf	4.96706E-08	lbs/hr	2.17557E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Benzo(a)anthracene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Benzo(a)pyrene	0.0000012	lbs/MMscf	2.48353E-08	lbs/hr	1.08779E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Benzo(b)fluoranthene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Benzo(g,h,i)perylene	0.0000012	lbs/MMscf	2.48353E-08	lbs/hr	1.08779E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Benzo(k)fluoranthene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Chrysene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Dibenzo(a,h)anthracene	0.0000012	lbs/MMscf	2.48353E-08	lbs/hr	1.08779E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Fluoranthene	0.000003	lbs/MMscf	6.20882E-08	lbs/hr	2.71946E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Fluorene	0.0000028	lbs/MMscf	5.7949E-08	lbs/hr	2.53817E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Indeno(1,2,3-cd)pyrene	0.0000018	lbs/MMscf	3.72529E-08	lbs/hr	1.63168E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Phenanthrene	0.000017	lbs/MMscf	3.51833E-07	lbs/hr	1.54103E-06	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
Pyrene	0.000005	lbs/MMscf	1.0348E-07	lbs/hr	4.53244E-07	tpy	AP-42, Tables 1.4-3 and 1.4-4 (7/98)
		Total POM	1.83E-06	lbs/hr	8.00E-06	tpy	
		Total HAP	3.91E-02	lbs/hr	1.71E-01	tpy	

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.

Methodology

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

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Hazardous Air Pollutant (HAP) Emissions from Asphalt Products (AP-42 11.1 [12/00])

Asphalt Storage	**TPY VOC**	**TPY PM10***
Storage Tanks	8.412742868	0.174985052
Asphalt Loading and Processing		
Equipment Fugitives	0.072848626	0.001515251
Loading	14.31281016	0.297706451
Reclaim Tank	0	0

*** assume that organic PM10 is 2.08% of total VOC**

	Speciation Profile for Loadout and Yard Emissions	Speciation Profile for Asphalt Storage Tank Emissions	HAP Emissions from Storage	HAP Emissions from Equipment	HAP Emissions from Loading	HAP Emissions from Reclaim Vessel	Total HAP Emissions from Loading & Yard Emissions	Total HAP Emissions	Total HAP Emissions
			lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	tons/yr
Federal HAPs - Listed	**Compound/VOC**	**Compound/VOC**							
1,1,1-Trichloroethane	ND	ND							
2-Butanone	0.049%	0.039%	6.561939437	0.071391654	14.02655396	0	14.09794561	**20.65988505**	**0.010329943**
Benzene	0.052%	0.032%	5.384155435	0.075762571	14.88532257	0	14.96108514	**20.34524057**	**0.01017262**
Bromomethane	0.0096%	0.0049%	0.824448801	0.013986936	2.748059551	0	2.762046487	**3.586495288**	**0.001793248**
Carbon Disulfide	0.013%	0.016%	2.692077718	0.018940643	3.721330642	0	3.740271284	**6.432349002**	**0.003216175**
Chloroethane	0.000%	0.004%	0.673019429	0.000305964	0.060113803	0	0.060419767	**0.733439196**	**0.00036672**
Chloromethane	0.015%	0.023%	3.869861719	0.021854588	4.293843048	0	4.315697636	**8.185559355**	**0.00409278**
Cumene	0.11%	ND		0.160266977	31.48818235	0	31.64844933	**31.64844933**	**0.015824225**
Ethylbenzene	0.28%	0.038%	6.39368458	0.407952306	80.1517369	0	80.5596892	**86.95337378**	**0.043476687**
Formaldehyde	0.088%	0.69%	116.0958516	0.128213582	25.19054588	0	25.31875946	**141.414611**	**0.070707306**
Hexane	0.15%	0.10%	16.82548574	0.218545878	42.93843048	0	43.15697636	**59.98246209**	**0.029991231**
Isooctane	0.002%	0.000%	0.052159006	0.002622551	0.515261166	0	0.517883716	**0.570042722**	**0.000285021**
Methylene Chloride	ND	0.00027%	0.045428811						**0**
MTBE	ND	ND							**0**
Naphthalene	1.25%	1.82%	6.36945588	0.037881286	7.442661283	0	7.480542569	**13.84999845**	**0.006924999**
Phenol	1.18%	ND		0.035759934	7.025872251	0	7.061632185	**7.061632185**	**0.003530816**
Styrene	0.0073%	0.0054%	0.90857623	0.010635899	2.089670283	0	2.100306183	**3.008882412**	**0.001504441**
Tetrachloroethene	0.008%	ND		0.011218688	2.204172765	0	2.215391453	**2.215391453**	**0.001107696**
Toluene	0.21%	0.062%	10.43180116	0.305964229	60.11380267	0	60.4197669	**70.85156806**	**0.035425784**
Trichloroethene	ND	ND							**0**
Xylene (m & p)	0.41%	0.20%	33.65097147	0.597358733	117.3650433	0	117.962402	**151.6133735**	**0.075806687**
Xylene (o)	0.080%	0.057%	9.590526869	0.116557802	22.90049626	0	23.01705406	**32.60758093**	**0.01630379**
Federal HAPs - POM/PAH	**Compound/Organic PM**	**Compound/Organic PM**							
2-Methylnaphthalene	2.380%	5.270%	18.44342444	0.072125968	14.17082708	0	14.24295305	**32.68637749**	**0.016343189**
Acenaphthene	0.260%	0.470%	1.644859486	0.007879307	1.548073547	0	1.555952854	**3.20081234**	**0.001600406**
Acenaphthylene	0.028%	0.014%	0.048995814	0.000848541	0.166715613	0	0.167564154	**0.216559968**	**0.00010828**
Anthracene	0.070%	0.130%	0.454961134	0.002121352	0.416789032	0	0.418910384	**0.873871518**	**0.000436936**
Benzo(a)anthracene	0.019%	0.056%	0.195983258	0.000575796	0.113128452	0	0.113704247	**0.309687505**	**0.000154844**
Benzo(a)pyrene	0.0023%	ND		6.97016E-05	0.013694497	0	0.013764198	**0.013764198**	**6.8821E-06**
Benzo(b)fluoranthene	0.0076%	ND		0.000230318	0.045251381	0	0.045481699	**0.045481699**	**2.27408E-05**
Benzo(e)pyrene	0.002%	0.010%	0.03324716	6.97016E-05	0.013694497	0	0.013764198	**0.047011358**	**2.35057E-05**
Benzo(g,h,i)perylene	0.002%	ND		5.75796E-05	0.011312845	0	0.011370425	**0.011370425**	**5.68521E-06**
Benzo(k)fluoranthene	0.002%	ND		6.66711E-05	0.013099084	0	0.013165755	**0.013165755**	**6.58288E-06**
Chrysene	0.103%	0.210%	0.734937217	0.003121418	0.61327529	0	0.616396708	**1.351333925**	**0.000675667**
Dibenzo(a,h)anthracene	0.00037%	ND		1.12129E-05	0.002203028	0	0.002214241	**0.002214241**	**1.10712E-06**
Fluoranthene	0.050%	0.150%	0.524955155	0.001515251	0.297706451	0	0.299221703	**0.824176858**	**0.000412088**
Fluorene	0.770%	1.010%	3.534698043	0.023334872	4.58467935	0	4.608014222	**8.142712266**	**0.004071356**
Indeno(1,2,3-cd)pyrene	0.00047%	ND		1.42434E-05	0.002798441	0	0.002812684	**0.002812684**	**1.40634E-06**
Perylene	0.02%	0.03%	0.104991031	0.000666711	0.130990839	0	0.131657549	**0.23664858**	**0.000118324**
Phenanthrene	0.81%	1.80%	6.299461859	0.024547073	4.822844511	0	4.847391585	**11.14685344**	**0.005573427**
Pyrene	0.15%	0.44%	1.539868455	0.004545754	0.893119354	0	0.897665108	**2.437533563**	**0.001218767**
	Total HAPs from Asphalt Emissions (lb/yr):		**253.9298269**	**2.377021691**	**467.0213025**	**0**	**469.3983241**	**723.2827222**	**0.361641361**
	Total HAPs from Asphalt Emissions (TPY):		**0.126964913**	**0.001188511**	**0.233510651**	**0**	**0.234699162**	**0.361641361**	

ND = Measured data below detection limits.

Example Calculation - Volatile Organic HAPs

Benzene Emissions due to Asphalt Storage Emissions:

$E_{BS} = VOC_S * B_S$

Where,

E_{BS} = Benzene emissions due to asphalt storage emissions

VOC_S = VOC emissions due to asphalt storage = 12.67 ton/yr

B_S = Speciation profile for benzene (storage) = 0.032%

E_{BS} = 12.67 ton/yr * 0.032% * 2,000 lb/ton = **12.94 lb/yr**

Example Calculation - Polycyclic Aromatic Hydrocarbons (PAH)

Acenaphthene due to Asphalt Storage

Organic PM10 will be estimated assuming that 2.08% of total VOC is organic PM10

$E_{BS} = VOC_S * B_S$ * % organic PM10

Where,

E_{BS} = Acenaphthene emissions due to asphalt storage emissions

VOC_S = VOC emissions due to asphalt storage = 12.67 ton/yr

B_S = Speciation profile for Acenaphthene (storage) = 0..470%

% organic PM10 = 2.08

E_{BS} = 12.67 ton/yr * 0.470% * 2.08% * 2,000 lb/ton = **2.98 lb/yr**

Warsaw, IN
NSPS Subpart K/Ka/Kb Tanklist

Tank ID	Contents	Coefficient to Use	Dia. (ft)	Height (ft)	Pet. Liq. "yes" or "no"	VOL "yes" or "no"	Maximum Capacity (gal)	Year Built	Maximum True Vapor Pressure (psia)	NSPS Appl.	Requirements & Comments
101	Asphalt	AC	10.50	31.00	yes	yes	20,080	1976	0.0268	-	
102	Reaction Tank	AC	29.67	16.00	yes	yes	82,751	1976	0.0631	-	
103	Reaction Tank	AC	29.67	16.00	yes	yes	82,751	1976	0.0631	-	
104	Asphalt	AC	29.89	32.00	yes	yes	167,966	1992	0.0268	Kb	Less than 0.5 psi
105	Asphalt	AC	51.00	32.00	yes	yes	489,002	1978	0.0268	-	
106	Asphalt	AC	51.00	32.00	yes	yes	489,002	1980	0.0268	-	
107	Asphalt	AC	10.50	38.00	yes	yes	24,614	1975	0.0268	-	
108	Asphalt	AC	134.00	40.00	yes	yes	4,219,783	2001	0.0268	Kb	Less than 0.5 psi
120	PMAC Preheat Tank	AC	10.50	38.00	yes	yes	24,614	1982	0.0345	-	
150	PMAC Mix Tank	AC	16.00	16.00	yes	yes	24,065	1982	0.1905	-	
201	Asphalt Emulsion & Cutback Emulsion	CB	15.39	32.00	yes	yes	44,529	1975	0.0309	-	
202	Asphalt Emulsion & Cutback Emulsion	CB	15.39	32.00	yes	yes	44,529	1975	0.0309	-	
203	Asphalt Emulsion & Cutback Emulsion	CB	15.39	32.00	yes	yes	44,529	1975	0.0309	-	
204	Asphalt Emulsion & Cutback Emulsion	CB	15.39	32.00	yes	yes	44,529	1975	0.0309	-	
205	Asphalt Emulsion & Cutback Emulsion	CB	14.00	35.00	yes	yes	40,304	2003	0.0309	Kb	Less than 0.5 psi
206	Asphalt Emulsion & Cutback Emulsion	CB	14.00	35.00	yes	yes	40,304	2003	0.0309	Kb	Less than 0.5 psi
207	Asphalt Emulsion & Cutback Emulsion	CB	21.50	24.00	yes	yes	65,179	1975	0.0309	-	
208	Asphalt Emulsion & Cutback Emulsion	CB	21.50	24.00	yes	yes	65,179	1975	0.0309	-	
209	Asphalt Emulsion & Cutback Emulsion	CB	29.67	24.00	yes	yes	124,127	1975	0.0309	-	
210	Asphalt Emulsion & Cutback Emulsion	CB	29.67	24.00	yes	yes	124,127	1975	0.0309	-	
211	Asphalt Emulsion & Cutback Emulsion	CB	15.00	32.00	yes	yes	42,301	2008	0.0309	Kb	Less than 0.5 psi
212	Asphalt Emulsion & Cutback Emulsion	CB	16.00	32.00	yes	yes	48,129	1986	0.0309	Kb	Less than 0.5 psi

Warsaw, IN
NSPS Subpart K/Ka/Kb Tanklist

Tank ID	Contents	Coefficient to Use	Dia. (ft)	Height (ft)	Pet. Liq. "yes" or "no"	VOL "yes" or "no"	Maximum Capacity (gal)	Year Built	Maximum True Vapor Pressure (psia)	NSPS Appl.	Requirements & Comments
300	Molton Sulfur	NA	8.00	14.00	no	no	5,264	2004	#N/A	-	
301	Crude Tall Oil	NA	10.50	31.00	no	yes	20,080	1975	*	-	
302	Crude Tall Oil	NA	10.50	31.00	no	yes	20,080	1975	*	-	
303	Tall Oil / MQB	NA	10.50	31.00	no	yes	20,080	1975	*	-	
304	Tall Oil / MQB	NA	10.50	31.00	no	yes	20,080	1975	*	-	
305	Tall Oil / MQB	NA	15.39	32.00	no	yes	44,529	1975	*	-	
306	Vinsol 5011	NA	10.50	16.00	no	yes	10,364	1975	*	-	
340	Caustic	NA	10.50	32.00	no	yes	20,728	1975	*	-	
341	Caustic	NA	10.50	32.00	no	yes	20,728	1975	*	-	
342	Phosporic Acid	NA	8.00	16.00	no	yes	6,016	2007	#N/A	-	
400	#2 Fuel Oil	DISTILLATI	10.50	31.00	no	yes	20,080	1975	0.0082	-	
401	LD-95	NA	10.50	16.00	no	yes	10,364	1975	*	-	
410	MT for 6 years	NA	10.50	16.00	no	no	10,364	1982	*	-	
500	Soap Solution	NA	8.00	22.00	no	yes	8,272	1975	*	-	
501	Soap Solution	NA	8.00	22.00	no	yes	8,272	1975	*	-	
520	Soap Solution	NA	5.25	6.00	no	yes	972	1975	*	-	
521	Soap Solution	NA	6.00	6.00	no	yes	1,269	1975	*	-	
530	Water	NA	10.50	20.00	no	no	12,955	1978	*	-	

Coefficients: AC - Asphalt Cement**; AE -** Asphalt Emulsion**; CB** - Cutback Emulsion**; DISTILLATE** - No.1 or No.2 Fuel Oil

SemMaterials, L.P.

Tank Throughput Determinations

Tank Turnovers

tank ID	tank volume (gal)	% of total volume	total throughput (mgal)	throughput per tank (mgal)	Logic
Base AC Storage					
101	20,080	0.37%	429,809	1,595	Total AC Volume is Apportioned by Tank Size
104	167,966	3.10%	429,809	13,343	
105	489,002	9.04%	429,809	38,847	
106	489,002	9.04%	429,809	38,847	
107	24,614	0.45%	429,809	1,955	
108	4,219,783	77.99%	429,809	335,222	
Asphalt Emulsion & Cutback Emulsion					
201	44,529	6.12%	170,820	10,452	Emulsion Throughput Apportioned Based on Tank Size
202	44,529	6.12%	170,820	10,452	
203	44,529	6.12%	170,820	10,452	
204	44,529	6.12%	170,820	10,452	
205	40,304	5.54%	170,820	9,460	
206	40,304	5.54%	170,820	9,460	
207	65,179	8.96%	170,820	15,299	
208	65,179	8.96%	170,820	15,299	
209	124,127	17.06%	170,820	29,135	
210	124,127	17.06%	170,820	29,135	
211	42,301	5.81%	170,820	9,929	
212	48,129	6.61%	170,820	11,297	
PMAC - Mix Tanks					
120	24,614	100.00%	15,434	15,434	Preheat 100%
102	82,751	50.00%	15,434	7,717	Reaction 50%
103	82,751	50.00%	15,434	7,717	Reaction 50%
150	24,065	100.00%	15,434	15,434	Mix Tank 100%
No.2 Fuel Oil					
400	20,280	100.00%	29,039	29,039	

Determination of Vapor Pressure of CB (Cutback Emulsion) at 200 °F

Parent Material: **CB (Cutback Emulsion)**

Constituent	Antoine's Coefficients			Pure VP[1], psi @ Temp, °F	Component %	MW (g/g-mole)	g-moles in 100 g	Molar Ratio	Partial Pressure [2] (psi) @ Temp (°F)
	A	B	C	200.00					200.00
Asphalt	75350.06	9.00346	0	0.000352213	83.00%	105	0.79047619	0.85805169	0.000302217
Distillate (No. 1 or 2)	5.747300	1,498.8920	225.5890	0.215685165	17.00%	130	0.13076923	0.14194831	0.030616145
					100.00%	**109.25**	**0.92124542**	**1**	**0.030918362**

Determination of Vapor Pressure of NA at 0 °F

Parent Material: **NA**

Constituent	Antoine's Coefficients			Pure VP[1], psi @ Temp, °F	Component %	MW (g/g-mole)	g-moles in 100 g	Molar Ratio	Partial Pressure [2] (psi) @ Temp (°F)
	A	B	C	0.00					0.00
Asphalt	75350.06	9.00346	0	7.41E-09	100.00%	105	0.95238095	1	7.41E-09
Distillate (No. 1 or 2)	5.747300	1,498.8920	225.5890	0.000662106	0.00%	130	0	0	0
					100.00%	**105.00**	**0.95238095**	**1**	**7.41E-09**

Determination of Vapor Pressure of NA at 0 °F

Parent Material: **NA**

Constituent	Antoine's Coefficients			Pure VP[1], psi @ Temp, °F	Component %	MW (g/g-mole)	g-moles in 100 g	Molar Ratio	Partial Pressure [2] (psi) @ Temp (°F)
	A	B	C	0.00					0.00
Asphalt	75350.06	9.00346	0	7.41E-09	100.00%	105	0.95238095	1	7.41E-09
Distillate (No. 1 or 2)	5.747300	1,498.8920	225.5890	0.000662106	0.00%	130	0	0	0
					100.00%	**105.00**	**0.95238095**	**1**	**7.41E-09**

NOTES:

1. The pure vapor pressure were determined using Antoine's Equation, as follows:

   Antoine's Equation: $\log(Pv) = A - B / (T + C)$, where:

   Pv = Vapor Pressure, mmHg
   T = Temperature, C
   A, B, C, = Constants

2. Calculated based on Raoult's Law, as follows: (Pure VP, mmHg) x (Wt'ed Avg. g-moles), where Wt'ed Avg. = (g-moles in 100 g) / S(g-moles in 100 g) and (g-moles in 100g) = (100 g / (MW, g/g-mole) x (%, by wt.).

Phosphoric Acid Emissions (100%)

Tank			
Diameter (ft)	8	**5.00**	= Tanks Turnovers
Height (ft)	16	30,078.94	= Througput (gallons/year)
Volume (cu. ft)	804.25	5.00	= Number of Tank Turnovers
Volume (gallons)	6015.79	4,021.25	= Volume Displaced (cu.ft.)
		104.00	= Temperature of Tank (F)
		0.1200	= 100% concentration Pv at Tank Temp From Table Below (mmHg)
		0.0023	= Pv (psia)
		10.73	= R [(psia)*(cu.ft.)/(lb-mol)*(T+460)]
		98.00	= MW of Phosphoric Acid
		1.59	= Phosphoric Acid Emissions (lbs) = (MW*P*V)/(R*T+460)

Assumptions
- Saturated Vapor
- No pressure control on tank

40.0 = Temp (C)

Concentration	Temperature, ° C					
H_3PO_4 %	**20.00**	**30.00**	**40.00**	**60.00**	**80.00**	**100.00**
0.00	17.60	31.80	55.30	150.00	355.00	760.00
5.00	17.50	31.50	54.50	147.00	352.00	755.00
10.00	17.30	31.00	54.20	146.00	350.00	753.00
20.00	17.00	30.00	53.00	141.00	341.00	735.00
30.00	16.30	28.90	50.50	136.00	327.00	705.00
50.00	13.00	23.10	40.30	108.00	257.00	575.00
75.00	5.65	10.00	17.50	47.00	111.00	240.00
85.00	2.16	3.95	6.95	19.70	48.80	111.00
100.00	0.0285	0.0595	0.1200	0.4300	1.3300	3.6500

Vapor Press in mm Hg

Equation for less than 100% Phosphoric Acid

104 = Tank Temp (F)
40.0 = Tank Temp (C)
50.00% = Phosphoric Acid (%)

18 = MW Water

Antoine's Coef. Water

A	B	C
8.07131	1730.63	233.426

Actuals
238,315.40 = Throughput Phosphoric (lbs)
125,429.16 = Throughput Water (lbs)

	(lb-mol)	(mol frac)	(Pure Pv)	(Part Pv)
Phosphoric	2,431.8	0.2587	**0.120**	0.0310
Water	6,968.3	0.7413	55.19	40.9145
Total	9,400.1	1.0000		40.9455

0.41 = Phosphoric Acid Emissions (lbs)

Example at 50% and 40 C
-0.0119 = Table Pv (at concentration and temp) - Pure Water Pv (at same conc. and temp)
-8.15 = Phosphoric Acid Emissions (lbs)
This approach assumes difference between table Pv and Pure Water is from Phosphoric Acid.

Alternative documentation demonstrating a lack of PPA emissions for utilized concentrations and storage temperatures.

Determination of vapor pressure on polyphosphorus acids. Mikhailin, A. D.; Markova, M. L.; Shirokova, T. A. USSR. Trudy NIUIFa (1968), No. 1(209), 102-9. From: Ref. Zh., Khim. 1969, Abstr. No. 22L118. CODEN: TUISA3 ISSN: 0372-2503. Journal written in Russian. CAN 74:116172 AN 1971:116172 CAPLUS
Abstract
The satd. vapor pressure was detd. for 4 polyphosphoric acid concns.: 99.99; 105.82; 111.53 and 114.17% based on H3PO4. Partial pressure of water and P2O5 vapors is detd. on polyphosphoric acid as a function of temp. and acid concn. Only water vapors are found at 100 and 200° in the vapor phase on polyphosphoric acids; an insignificant amt. of H3PO4 appeared only at 300-400°. With increase of P2O5 in the acid, the partial pressure of water and H3PO4 vapors decreased indicating the great chem. affinity of polyphosphoric acid for water

The Vapor Pressure of Water Over Phosphoric Acids
Fontana, B.J., 1950
"It should first be noted that separate experiments established that no appreciable amounts of acid were present in the vapor phase over even the most concentrated acid at the highest temperature employed. The measurements correspond then only to the vapor pressure of water over phosphoric acid."

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Meteorological Data - (Tanks 4.0)

City (for which Meteorological Data is provided)	South Bend, IN	
Average Barometric Pressure	14.33	psia
Average Daily Minimum Ambient Temperature, F	45.53	F
Average Daily Maximum Ambient Temperature, F	58.52	F
Daily Average Temperature, F	49.52	F
Daily Total Solar Insulation Factor, Btu/ft^2/day	1202.9	Btu/ft^2/day

Product Density, Antoine Coefficients, & Vapor Molecular Weight

			Source:
Asphalt Cement & Polymer-Modified Asphalt Cement			
Coefficient Name:	**AC**		
Density:	8.4	lbs/gal	EPA AP-42, Ch.11 (Hot Mix Asphalt Plants)
Vapor Molecular Weight:	105	lb/lb-mol	EPA AP-42, Ch.11 (Hot Mix Asphalt Plants)
A=	75350.06		EPA AP-42, Ch.11 (Hot Mix Asphalt Plants)
B=	9.00346		
C=	0		
Asphalt Emulsions			
Coefficient Name:	**AE**		
Density:	7.9	lbs/gal	
Vapor Molecular Weight:	105	lb/lb-mol	EPA AP-42, Ch.11 (Hot Mix Asphalt Plants)
A=	75350.06		EPA AP-42, Ch.11 (Hot Mix Asphalt Plants)
B=	9.00346		EPA AP-42, Ch.11 (Hot Mix Asphalt Plants)
C=	0		
#1 and #2 Fuel Oils			
Coefficient Name:	**DISTILLATE**		From Tanks 4.0
Density:	7.9	lbs/gal	
Vapor Molecular Weight:	130	lb/lb-mol	
A=	5.7473		
B=	1498.892		
C=	225.589		
#6 Fuel Oil/Residual/SC Basestock			
Coefficient Name:	**RES**		See SemMaterials Vapor Pressure MEMO
Density:	7.9	lbs/gal	
Vapor Molecular Weight:	130	lb/lb-mol	
A=	4.2709		
B=	1276.034		
C=	160.458		
Asphalt Extenders, No. 4 Fuel Oil, Brezlube			
Coefficient Name:	**EXT**		See SemMaterials Vapor Pressure MEMO
Density:	7.9	lbs/gal	
Vapor Molecular Weight:	130	lb/lb-mol	
A=	4.2709		
B=	1276.034		
C=	160.458		
Cutback and Cutback Emulsions			
Coefficient Name:	**CB**		See SemMaterials Vapor Pressure MEMO
Density:	0	lbs/gal	See Cutback Coeffecients-13 Tab
Vapor Molecular Weight:	0	lb/lb-mol	
A=	0		
B=	0		
C=	0		

SemMaterials, L.P.

Railcar Heating Emission Calcs

1. Basis

Using the Ideal Gas Law, PV=nRT, the volume change realized when the worse case VOC product (Asphalt Cement) is heated at atmospheric pressure. The calculated mass is adjusted for the vapor pressure of asphalt cement in the vapor phase.

PL * V = n * R * T

Symbol	Description	Value	Units	Formula
PM =	atm or operating pressure of mixture	14.326	psi	given
PL =	vapor pressure of pure chemical	0.00915132	psi	PL = (10^((-0.05223*A/T)+B))*0.019337
MW =	vapor molec. wt.	105	lb/lb-mole	given
R =	gas constant	10.726	psi*ft3/lb-mole-R	constant
T2 =	temp of heated prod.	320	degrees F	given
T1 =	temp of incoming prod.	200	degrees F	given
V =	change in volume,	calculated	cubic feet	V = (V2-V1)*density
n=	moles	calculated	moles	n = PL*V/R*T
Y =	mole fraction of chemical in vapor phase	calculated	no units	Y = PL/PM
m =	VOC mass of pure chemical	calculated	lbs.	m =PM*V*MW/(R*T)
mL =	VOC mass lost from mixture	calculated	lbs.	mL = m * (PL/PM)

2. Operating Data and Calculations

1100.813995 = Actual RC heated per year

Railcar Dimensions

110 = diameter (in)
44.8 = length (ft)
22,117 = geometric capacity (gal)
22,000 = nominal capacity (gal)

15.61534174 = vapor space volume at atmospheric conditions prior to heating (cubic feet)

18.45449478 = vapor space volume at atmospheric conditions after heating (cubic feet)

2.839153044 = Change in Volume, V (cubic feet)

0.510470506 = VOC mass of pure chemical in vapor space, m (lbs/RC)

0.000326084 = VOC mass loss from mix in vapor space, mL (lbs/RC)

3. Emissions Summary

0.358957917 = lbs per year
0.000179479 = tons per year