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Calculation Cover Sheet

RIVER PROTECTION PROJECT-WASTE TREATMENT PLANT	JOB NO.: 24590
CALC NO. 24590-WTP-HAC-50-00001	GROUP E&NS
SUBJECT Estimated Organic Emissions from Process Cells	

CALCULATION STATUS DESIGNATION	☒ PRELIMINARY ☐ SUPERSEDED	☐ COMMITTED PRELIMINARY		☐ CONFIRMED ☐ VOIDED	
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Originator – John Sipkowski
Reviewer – Lee Bostic
Approver – Phil Peistrup

NO.	REASON FOR REVISION	TOTAL NO OF SHEETS	LAST SHEET NO	BY	CHECKED	APPROVED/ ACCEPTED	DATE
C	Preliminary Calculation. Complete revision based upon updated source data. Reformatted to include Excel tables as an appendix.	39	A-29	J. Sipkowski	L. Bostic	P. Peistrup	7/14/03
B	Preliminary Calculation. Table 1 from Version A deleted. The summary was revised accordingly.	47	47	J. Sipkowski	L. Bostic	P. Peistrup	10/3/02 7-15-03
A	Preliminary Calculation	48	48	J. Sipkowski	L. Bostic	P. Peistrup	8/22/02 7-15-03

RECORD OF REVISIONS

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

BY: John Sipkowski

DATE: July 9, 2003

SUBJECT: Estimated Organic Emissions from Process Cells

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Acronyms

EPA	US Environmental Protection Agency
HEPA	high efficiency particulate air (filter)
HLW	high-level waste
LAW	low-activity waste
PICs	products of incomplete combustion
SOCMI	synthetic organic chemical manufacturing industry
WAC	Washington Administrative Code
WTP	Hanford Tank Waste Treatment and Immobilization Plant

BY: John Sipkowski
DATE: July 9, 2003

SUBJECT: Estimated Organic Emissions from Process Cells

Summary

This calculation estimates the potential emission of organic compounds from ancillary equipment located within the Hanford Tank Treatment and Immobilization Plant (WTP) process cells. First, the release of organic compounds from ancillary equipment into the process cells was estimated. The release amount was then apportioned to each individual organic compound. Only a portion of the released organic material will result in uncontrolled emission. Particulate and particle-bound organics will be abated by the HEPA filters in the process cell offgas treatment system. The vapor phase will not be abated by the HEPA filters and will comprise the potential organic emissions from the process cells.

1 Introduction

This calculation estimates the potential emission of organic compounds from the WTP process cells as a result of treating the Hanford tank waste. The process cells will be operated under negative pressure with respect to atmospheric pressure, and the air from the process cells will be released to the atmosphere through a stack or flue. According to the Washington Administrative Code (WAC), WAC 173-400-030(32), fugitive emissions "means emissions which do not pass and which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening." Consequently, the Washington State Department of Ecology (Ecology) has agreed (CCN 023430) that fugitive emissions are not applicable to the WTP. However, Ecology requested that the WTP estimate the potential emission of organic compounds that are not abated by the WTP offgas treatment systems.

In response to that request, this calculation estimates the potential unabated emission of organic compounds from the WTP process cells. This estimate is based upon Environmental Protection Agency (EPA) guidance documents. The emission estimate was made using the following process:

- Estimate the annual release of organic material into the process cells from ancillary equipment for the pretreatment plant, the low-activity waste (LAW) vitrification plant, and the high-level waste (HLW) vitrification plant
- Determine the weight fraction of individual organic compounds in the streams being evaluated
- Apportion the annual release of organic material to the individual organic compounds
- Apply ventilation abatement to the applicable organic compounds

This process resulted in an estimate of the potential emission of each organic compound from the pretreatment plant, the LAW plant, and the HLW plant process cells given in Appendix A, Tables 7, 8, and 9, respectively.

The scope of this calculation is limited to providing an estimate of potential organic compound emission from process cells to support the WTP risk assessment process.

2 Release Calculation Methodology

Building ventilation and process offgases will be treated by abatement systems that employ best available control technology for criteria pollutants, radionuclides, and toxic air pollutants prior to discharge into the atmosphere through a stack or flue. Organic compounds may be released into the process cells from ancillary equipment. Process cell ventilation will be treated by high efficiency particulate air (HEPA)

filters that will abate particulate or particle bound organic compounds. Vapor phase organic compounds will not be abated by the HEPA filters and are considered in this calculation to be process cell organic emissions.

The following sections present the formula for estimating the release of organic compounds from ancillary equipment within process cells and describes adjustments to the formula based upon the design and operation of the WTP.

2.1 Release Calculation Formula

The estimated release of organic material from ancillary equipment was calculated using the EPA guidance document, *Protocol for Equipment Leak Emission Estimates* (EPA 1995). This guidance provides several different methods to determine releases. The guidance recommends using the method that best matches the type of process being evaluated and the data available on that process. Since the WTP is not in operation, actual release measurements are not available, thus average release factors, given in the guidance, were used for the calculation. The formula for estimating releases using the average release factors is:

$$E_{HO} = N \cdot R_{avg} \cdot WF_s \cdot H$$

Where:

E_{HO} = estimated annual release of organic compounds, kg/year
N = ancillary equipment count by equipment type
R_{avg} = average release factor by equipment type, kg/hour
H = hours of operation, hours/year
WF_S = weight fraction of organic material by waste stream

An explanation of each formula value is discussed in the following sections, and the calculations are presented in Appendix A, Table 1.

2.2 Count of Ancillary Equipment by Equipment Type

The EPA guidance (EPA 1995) determined that the following ancillary equipment types are sources of potential release:

- Valves
- Pump seals
- Compressor seals
- Pressure relief valves
- Connectors
- Agitator seals
- Open-ended lines
- Sampling connections

The potential to emit for each of these ancillary equipment types are discussed below as they pertain to the design and operation of the WTP.

Valves

Valves that contact the waste were included in the release estimate.

Pumps

Reverse flow diverter pumps were not considered in this calculation since these offgases will be captured in process vessel ductwork, treated by the offgas treatment train, and released from the plant stack. The resultant estimated emissions are already included in the *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant (*Emission Baseline Report) (24590-WTP-RPT-PO-03-008).

The WTP will also use conventional, centrifugal pumps. Centrifugal pumps that contact the waste will be equipped with double mechanical seals with an inert barrier fluid at greater pressure than the waste. It is assumed that there is no potential for releases from these pumps.

Compressors

The design of the WTP does not include compressors that contact the waste.

Pressure relief valves

Pressure relief valves on the process vessels and tanks were not considered sources of release in this calculation since all of the process vessels and tanks that manage the Hanford tank waste will operate under one to two inches of water gauge vacuum. The EPA guidance (EPA 1995) considers equipment under vacuum to be zero release.

Connections

Welded connections are considered to be zero release in the EPA guidance (EPA 1995). Other types of connectors such as gasketed flanged connections that contact the waste were included in this release estimate.

Agitator seals

Most of the process vessels that are agitated will use pulse jet mixers located within the vessels being agitated. Emissions from pulse jet mixers were not considered in this calculation since these offgases will be captured in the process vessel ductwork, treated by the offgas treatment train, and released from the plant stacks. The resultant estimated emissions are already included in the Emission Baseline Report (24590-WTP-RPT-PO-03-008).

Certain vessels will employ mechanical agitators that do employ a seal. These seals will be in the vapor space of the vessel, and the vessels will be under one to two inches of water gauge vacuum. The EPA guidance (EPA 1995) considers equipment under vacuum to be zero release.

Open-ended lines

The design of the WTP does not include open-ended lines.

Sampling systems

Sampling systems in the WTP will be closed-loop and are considered in the EPA guidance (EPA 1995) to be zero emission.

Thus, this calculation includes release calculations for valves and gasketed flanged type connectors that will contact the Hanford tank waste.

The ancillary equipment count by equipment type, N, is given in Appendix A, Table 1. The count of connectors that contact the Hanford tank waste was provided by Melter Systems (CCN 068046, CCN 068047) and the Pretreatment Jumper Group (CCN 068045). The count of valves was taken from the Plant Item List (PIL-4.08.06).

2.3 Average Release Factors

The EPA developed the average release factors through extensive measurements of actual processes in operation. This calculation used average release factors developed for the synthetic organic chemical manufacturing industry (SOCMI) since the processes proposed for the WTP are similar to the processes used in SOCMI.

The SOCMI average release factors for valves are based upon the type of service. The EPA guidance (EPA 1995) defines the types of service as:

- Gas/vapor – material in a gaseous state at operating conditions;
- Light liquid – material in a liquid state in which the sum of the concentrations of individual constituents with a vapor pressure over 0.3 kilopascals at 20° C is greater than or equal to twenty weight percent; or,
- Heavy liquid – not in gas/vapor service or light liquid service.

The release factor for heavy liquid service was used in this calculation since the *RPP-WTP Waste Feed Assessment* report (RPT-24590-EN00003) determined the total organic carbon content of the Hanford waste to be bounded at four weight percent.

The average release factor for connectors is the same regardless of the type of service. The average release factors, R_{avg}, applicable to the WTP are shown in Appendix A, Table 1.

2.4 Weight Fraction of Organic Material

The EPA guidance (EPA 1995) states that the weight fraction must be determined for each waste stream under evaluation. Four waste streams were evaluated for the calculation of ancillary equipment releases. These four waste streams are:

(1) The waste feed from receipt through the pretreatment evaporator process labeled the "pretreatment feed stream"
(2) The waste stream after the pretreatment evaporator labeled the "post-evaporator stream"
(3) The LAW concentrate through the LAW vitrification process labeled the "LAW stream"
(4) The HLW concentrate through the HLW vitrification process labeled the "HLW stream"

Section 3 addresses the determination of the weight fraction of the individual organic compounds in each of the four evaluated streams. The individual weight fractions were summed for each of the evaluated streams and entered onto Appendix A, Table 1 as the respective waste stream organic weight fraction, WF_S.

2.5 Hours of Operation

The calculation will use 8760 hours of operation which represents continuous operation for a year. The operating hours used is conservative since the average operational availability of the WTP is approximately 71% as determined in *LAW Vitrification Capacity and Availability Study* (24590-LAW-RPT-ENG-01-001). In addition, most of the transfer pipes will remain empty between transfers and will be flushed with water after transfer to prevent solids from settling in the line and to minimize corrosion.

2.6 Estimated Release of Organic Material

Appendix A, Table 1 gives the estimated release of organic material, E_{HO}, into the process cells of the pretreatment plant feed and post-evaporator streams, the LAW stream, and the HLW stream as a result of applying the average release calculation formula.

3 Weight Fraction of Individual Organic Compounds

The following sections discuss the determination of the weight fraction of each organic compound in each of the four evaluated streams.

3.1 Weight Fraction of Organic Compounds in the Pretreatment Feed Stream

The *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003) determined the upper bound concentration of individual organic compounds in the Hanford waste feed to the WTP. These concentrations are the starting point for the organic emissions calculations from the three production plants. The concentrations were given in milligrams per liter, mg/L. The formula given in the EPA guidance (1995) in section 2.1 to estimate the release of organic compounds requires the organic concentration to be expressed as a weight fraction. The milligrams per liter, mg/L, were converted to weight fractions, mg/kg, using the density, ρ, of the waste provided in the *RPP-WTP Waste Feed Assessment* (RPT-24590-EN00003). The values are given in Appendix A, Table 2. The individual weight fractions were summed in Appendix A, Table 2 to yield the waste stream organic weight fraction, WF_S, for the pretreatment feed stream and entered onto Appendix A, Table 1.

3.2 Weight Fraction of Organic Compounds in the Post-Evaporator, LAW, and HLW Streams

The Emission Baseline Report (24590-WTP-RPT-03-008) estimated the mass flow rate of fifty organic compounds in the waste using a computer model. The fifty organic compounds were selected as representative of the full spectrum of organic compounds in the waste. These fifty organic compounds were organized into thirty-five groups, termed Henry's Grouping, based upon the similarity of properties such as Henry's Law constant, molecular weight, vapor pressure, and solubility. The unmodeled organic compounds in the waste were assigned to one of the thirty-five groups based upon that compound's similar Henry's Grouping properties.

The model estimated the mass flow rate for each of the fifty organic compounds in the post-evaporator, the LAW, and the HLW streams shown in Appendix A, Tables 2, 3, and 4, respectively. Each unmodeled organic compound was then assigned, by stream, a mass flow rate associated with the appropriate Henry's Grouping. Some of the Henry's Groupings contain more than one modeled compound. In that case, the mass flow rates were averaged, and the average value was assigned to the unmodeled organic compounds in that Henry's Grouping. Appendix A, Table 6 shows the Henry's Grouping number and corresponding mass flow rate assigned to each organic compound, both modeled and unmodeled, in the post-evaporator stream; Appendix A, Table 8 shows the LAW stream; and Appendix A, Table 9 shows the HLW stream.

The formula given in the EPA guidance (1995) in section 2.1 to estimate the release of organic compounds requires the organic concentration to be expressed as a weight fraction. The mass flow rates were converted to weight fractions using the respective density for the three streams. The density used for this calculation is the density of the liquid phase of the waste stream being evaluated since the model apportioned the organic compounds to the liquid phase. A conversion factor was calculated to convert from mass flow rate to weight fraction according to the following formula:

$$\text{Conversion Factor} = Q_M \text{ g/s} \cdot 60 \text{ s/min} \cdot \text{min}/Q_V \cdot 35.315 \text{ ft}^3/1000\text{L} \cdot 1000 \text{ mg/g} \cdot 1/\rho \text{ kg/L}$$

Where:
Q_M = mass flow rate of the individual organic compound
Q_V = volumetric flow rate of the evaluated stream
ρ = density of the liquid phase of the evaluated stream

Appendix A, Table 6 shows the mass flow rate and conversion to a weight fraction for each of the organic compounds for the post-evaporator stream. The individual weight fractions were summed to yield the waste stream organic weight fraction, WF_S, for the post-evaporator stream. Appendix A, Table 8 presents the same information for the LAW stream, and Appendix A, Table 9 presents the same information for the HLW stream. The waste stream organic weight fractions, WF_S, for each of the evaluated streams was entered into Appendix A, Table 1.

4 Estimated Release of Organic Compounds

The *Human Health Risk Assessment Protocol* (EPA 1998) presents a method to speciate the release of organic compounds by multiplying the weight ratio of each individual organic compound by the total release from the waste streams being evaluated. This method was used to estimate the individual organic compound released into the WTP process cells for each of the evaluated streams.

The weight ratio for each organic compound for each stream was determined by dividing the individual organic compound weight fraction by the total weight fraction of all organic compounds in that stream.

The estimated release of each individual organic compound for each stream, R_{IO}, was then determined by multiplying the estimated release for the stream, ER_O, from Appendix A, Table 1 times the individual organic compound weight ratio, WR_i. These calculations were made for the pretreatment feed stream, the post-evaporator stream, the LAW stream, and the HLW stream. The resulting estimated releases into the process cells are given in Appendix A, Tables 5, 6, 8, and 9, respectively.

5 Estimated Emission of Organic Compounds

This section discusses the calculation of the estimated emission of organic compounds from the WTP process cells.

5.1 Unabated Organic Compound Emissions

Only a portion of the organic compound released into the process cells will result in unabated emissions. Organic compounds that are particle-bound or particulate will be abated by the high-efficiency particulate air (HEPA) filters. The Emission Baseline Report (24590-WTP-RPT-03-008) separated the organic compounds into particle-bound or particulate, and vapor phase. According to the Emission Baseline Report (24590-WTP-RPT-03-008), HEPA filters will abate the particle-bound or particulate organic compounds at a decontamination factor of two hundred thousand. Therefore, particle-bound or particulate organic compounds were not considered as uncontrolled emissions in this calculation.

Vapor phase organic compounds released into the process cells will not be captured by the HEPA filters and will represent potential unabated emissions. Appendix A, Table 5 gives the estimated organic vapor emission, R_{VO}, from the pretreatment feed stream by listing the release of each vapor phase organic compound as an emission and each particle-bound or particulate organic compound as zero emission. This process is repeated for the post-evaporator stream in Appendix A, Table 6. The feed stream and post-evaporator stream releases are summed in Appendix A, Table 7 to give the estimated emission of organic compounds from the pretreatment process cells. Appendix A, Table 8 gives the estimated emission of organic compounds from the LAW process cells, and Appendix A, Table 9 gives the estimated emission of organic compounds from the HLW process cells.

5.2 Potential Emissions Not Considered

The Emission Baseline Report (24590-WTP-RPT-03-008) proposed that the temperature and conditions in the melters and thermal oxidation units are sufficient to generate products of incomplete combustion (PICs) that would be introduced into the offgas streams. The melter offgas containing the PICs will be treated by a melter submerged bed scrubber, which will recycle scrubber liquor back into the pretreatment process. However, the Emission Baseline Report (24590-WTP-RPT-03-008) predicted that PICs recycled to the pretreatment plant will be at concentrations orders-of-magnitude less than the constituent organic compounds. Thus, PICs were not included as emissions in this calculation.

6 References

6.1 Codes and Standards

EPA 1995. *Protocol for Equipment Leak Emission Estimates*, EPA-453/R-95-017. November 1995. US Environmental Protection Agency, Research Triangle Park, North Carolina, USA.

EPA 1998. *Human Health Risk Assessment Protocol*, EPA530-D-98-001A. July 1998. US Environmental Protection Agency, Research Triangle Park, North Carolina, USA.

WAC 173-400. *General Regulations for Air Pollution Sources*, as amended. Washington Administrative Code.

6.2 Project Documents

24590-LAW-RPT-ENG-01-001, Rev. 0, *LAW Vitrification Capacity and Availability Study.*

CCN 023430, Meeting Minutes from 9/6/2001 and 9/7/2001 Meeting with the following purpose: "Discuss Proposed Final Resolution of Remaining Open Comments on the Risk Assessment Work Plan, Item 27.

CCN 068045, E-mail message from Ian Tanner to John Sipkowski, 28 May 2003, "Jumper Breakdown for Environmental Risk Assessment."

CCN 068046, E-mail message from Steven Cross to John Sipkowski, 28 May 2003, "Jumper Counts – Slurry Carrying Jumpers."

CCN 068047, E-mail message from Connie Feuz to John Sipkowski, 4 June 2003, "Connector Count."

PIL-4.08.06, Plant Item List, September, 2001.

24590-WTP-RPT-PO-03-008, Rev. 0, *Integrated Emissions Baseline Report for the Hanford Tank Waste Treatment and Immobilization Plant.*

RPT-24590-EN00003, Rev. 0, *RPP-WTP Waste Feed Assessment.*

Appendix A

Excel Worksheets:

Table 1. Estimate of the Release of Organic Compounds from Ancillary Equipment A-1

Table 2. Post-Evaporator Concentration and Henry's Law Grouping A-2

Table 3. LAW Stream Concentration and Henry's Law Grouping A-3

Table 4. HLW Stream Concentration and Henry's Law Grouping A-4

Table 5. Estimate of Organic Emissions from the Pretreatment Feed Stream A-5

Table 6. Estimate of Organic Emissions from the Post-Evaporator Stream A-9

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells A-14

Table 8. Estimate of Organic Emissions from the LAW Process Cells A-20

Table 9. Estimate of Organic Emissions from the HLW Process Cells A-25

The *Protocol for Equipment Lead Emission Estimates* (EPA 1995) provides the following formula to calculate the estimated release of organic material from ancillary equipment.

$E_{HO} = N \times R_{avg} \times WF_S \times H$, where:

E_{HO} = estimated annual release, kg/year

N = ancillary equipment count by equipment type; equipment count was obtained form Melter Systems group, Area Plant Design, and the Plant Item List (PIL-4.08.06)

R_{avg} = average release factor by equipment type, (kg/hour); from *Protocol for Equipment Leak Emission Estimates* (EPA 1995)

WF_S = weight fraction of organic material = WFs from tables 5, 6, 8, and 9 for Pretreatment Feed Stream, Post-Evaporator Stream, LAW Stream, and HLW Stream respectively * 1/(1000*1000) to convert from mg/kg to kg/kg

$ER_O = E_{HO}$ kg/yr * 1000 gm/kg / (365 d/yr * 24 hr/d *60 min/hr * 60 s/min) where:

ER_O = waste stream organic release (gm/s) by equipment type

$ER_{O\text{-}PTF}$ = sum of Pretreatment Feed Stream estimated release = Sum ER_O by equipment type

$ER_{O\text{-}PE}$ = sum of Post-Evaporator Stream estimated release = Sum ER_O by equipment type

$ER_{O\text{-}LA}$ = sum of LAW Stream estimated release = Sum ER_O by equipment type

$ER_{O\text{-}HL}$ = sum of HLW Stream estimated release = Sum ER_O by equipment type

Table 1. Estimate of the Release of Organic Compounds from Ancillary Equipment. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

Plant	Waste Stream	Equipment Type	Count N	R_{avg} (kg/hour)	Waste Stream Organic Weight Fraction WF_S	Operating Hours H hr/yr	Estimated Annual Release E_{HO} (kg/yr)	Estimated Release ER_O (gm/s)
Pretreatment	Pretreatment Feed Stream	Valves	15	0.00023	0.0083839	8760	0.2534	8.04E-06
		Connectors	170	0.00183	0.0083839	8760	22.8482	7.25E-04
	Pretreatment Feed Stream Total $ER_{O\text{-}PTF}$ =							**7.33E-04**
	Post-Evaporator Stream	Valves	355	0.00023	0.0014825	8760	1.0604	3.36E-05
		Connectors	978	0.00183	0.0014825	8760	23.2426	7.37E-04
	Post-Evaporator Stream Total $ER_{O\text{-}PE}$ =							**7.71E-04**
LAW	LAW Stream	Valves	32	0.00023	0.002454995	8760	0.1583	5.02E-06
		Connectors	44	0.00183	0.002454995	8760	1.7316	5.49E-05
	LAW Stream Total $ER_{O\text{-}LA}$ =							**5.99E-05**
HLW	HLW Stream	Valves	26	0.00023	0.0010959	8760	0.0574	1.82E-06
		Connectors	48	0.00183	0.0010959	8760	0.8432	2.67E-05
	HLW Stream Total $ER_{O\text{-}HL}$ =							**2.85E-05**

CF_{PE} = 60 sec/min x 1/ Q_V ft^3/min x 35.315 ft^3/1000 L x 1000 mg/L x ρ kg/L = Concentration mg/kg
CF_{PE} = Conversion Factor
Q_V = Volumetric Flow Rate from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet FEP03 = 1.19E+00 ft^3/min
ρ = Density from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet FEP03 = 1.50E+00 kg/L
Note: Un-rounded values for Q_V and ρ rom Sheet FET03 were used for the calculations.
CF_{PE} = 1190.702384

Q_M = Compound Mass Flow Rate from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet FEP03
WF_i = Weight Fraction = Q_M * CF_{PE}
Average Weight Fraction WF_a = average WF_i for Henry's Law Group

Table 2. Post-Evaporator Concentration and Henry's Law Grouping. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

Compound CAS#	Organic Compounds	Compound Mass Flow Rate Q_M g/s	Individual Organic Weight Fraction. WF_i mg/kg	Henry's Law Grouping HL	Henry's Law Group Average Organic Weight Fraction. WF_a mg/kg
100-21-0	p-Phthalic acid	4.82E-02	5.74E+01	1	5.74E+01
88-89-1	Picric acid	5.99E-02	7.13E+01	2	7.13E+01
144-62-7	Oxalic acid	4.83E-03	5.75E+00	3	5.75E+00
75-12-7	Formamide	4.80E-02	5.72E+01	4	5.72E+01
60-35-5	Acetamide	1.05E-02	1.24E+01	5	1.24E+01
87-86-5	Pentachlorophenol	4.63E-02	5.51E+01	6	5.51E+01
126-73-8	Tributyl phosphate	3.81E-02	4.54E+01	7	4.54E+01
108-95-2	Phenol	3.00E-02	3.57E+01	8	3.49E+01
84-66-2	Diethyl phthalate	2.24E-02	2.67E+01	8	3.49E+01
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	3.55E-02	4.23E+01	8	3.49E+01
62-75-9	N-Nitroso-N,N-dimethylamine	1.94E-02	2.31E+01	9	2.31E+01
122-39-4	N,N-Diphenylamine	1.33E-03	1.58E+00	10	8.11E-01
8001-35-2	Toxaphene	3.50E-05	4.17E-02	10	8.11E-01
4170-30-3	2-Butenaldehyde (2-Butenal)	4.69E-04	5.58E-01	11	1.90E+00
58-90-2	2,3,4,6-Tetrachlorophenol	2.34E-03	2.78E+00	11	1.90E+00
98-86-2	Acetophenone	1.98E-03	2.36E+00	11	1.90E+00
57-14-7	1,1-Dimethylhydrazine	1.63E-03	1.94E+00	12	1.94E+00
120-12-7	Anthracene	2.62E-04	3.12E-01	13	2.49E-01
75-05-8	Acetonitrile	1.56E-04	1.86E-01	13	2.49E-01
208-96-8	Acenaphthylene	8.79E-05	1.05E-01	14	1.05E-01
132-64-9	Dibenzofuran	2.88E-05	3.43E-02	15	3.43E-02
106-93-4	Ethylene dibromide (Dibromethane)	2.80E-06	3.33E-03	16	1.33E-03
76-44-8	Heptachlor	3.29E-07	3.92E-04	16	1.33E-03
91-20-3	Naphthalene	2.25E-07	2.68E-04	16	1.33E-03
120-82-1	1,2,4-Trichlorobenzene	1.08E-07	1.29E-04	17	1.29E-04
118-74-1	Hexachlorobenzene	6.76E-09	8.05E-06	18	8.05E-06
10061-01-5	cis-1,3-Dichloropropene	2.16E-08	2.57E-05	19	1.06E-05
108-88-3	Toluene	1.94E-09	2.31E-06	19	1.06E-05
71-43-2	Benzene	3.19E-09	3.80E-06	19	1.06E-05
79-01-6	Trichloroethylene	6.57E-10	7.82E-07	20	7.31E-07
87-68-3	Hexachlorobutadiene	5.70E-10	6.79E-07	20	7.31E-07
127-18-4	Perchloroethylene (tetrachloroethylene)	1.20E-10	1.43E-07	21	1.43E-07
56-23-5	Carbon tetrachloride	3.25E-11	3.86E-08	22	3.86E-08
106-99-0	1,3-Butadiene	1.78E-12	2.12E-09	23	2.12E-09
110-82-7	Cyclohexane	2.13E-13	2.53E-10	24	2.53E-10
108-87-2	Methylcyclohexane	9.07E-15	1.08E-11	25	1.08E-11
106-97-8	Butane	8.13E-16	9.68E-13	26	9.68E-13
110-54-3	n-Hexane	1.23E-16	1.47E-13	27	1.47E-13
111-84-2	n-Nonane	1.86E-17	2.22E-14	28	2.22E-14
76-15-3	Chloropentafluoroethane	4.19E-18	4.99E-15	29	4.99E-15
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	1.16E-04	1.38E-01	30	3.21E-01
50-32-8	Benzo(a)pyrene	4.23E-04	5.04E-01	30	3.21E-01
84-74-2	Dibutyl phthalate	1.29E-02	1.53E+01	31	1.53E+01
218-01-9	Chrysene	4.88E-03	5.81E+00	32	3.47E+00
58-89-9	gamma-BHC (Lindane)	1.73E-05	2.06E-02	32	3.47E+00
603-34-9	Triphenylamine	3.84E-03	4.57E+00	32	3.47E+00
129-00-0	Pyrene	2.21E-03	2.63E+00	33	1.33E+00
60-57-1	Dieldrin	1.86E-05	2.21E-02	33	1.33E+00
309-00-2	Aldrin	7.54E-06	8.98E-03	34	8.98E-03
1336-36-3	Polychlorinated biphenyls (PCBs)	5.01E-05	5.97E-02	35	5.97E-02

CF_{LA} = 60 sec/min x 1/ Q_V ft^3/min x 35.315 ft^3/1000 L x 1000 mg/L x ρ kg/L = Concentration mg/kg
CF_{LA} = Conversion Factor
Q_V = Volumetric Flow Rate from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet TCP03 = 4.24E-01 ft^3/min
ρ = Density from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet TCP03 = 1.76E+00 kg/L
Note. Un-rounded values for Q_V and ρ rom Sheet TCP03 were used for the calculations.
CF_{LA} = 2835.87806

Q_M = Compound Mass Flow Rate from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet FEP03
WF_i = Weight Fraction = Q_M * CF_{LA}
Average Weight Fraction WF_a = average WF_i for Henry's Law Group

Table 3. LAW Stream Concentration and Henry's Law Grouping. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

Compound CAS#	Organic Compounds	Compound Mass Flow Rate Q_m g/s	Individual Organic Weight Fraction. WF_i mg/kg	Henry's Law Grouping HL	Henry's Law Group Average Organic Weight Fraction. WF_a mg/kg
100-21-0	p-Phthalic acid	2.73E-02	77.48	1	7.75E+01
88-89-1	Picric acid	3.64E-01	1032.27	2	1.03E+03
144-62-7	Oxalic acid	2.73E-03	7.73	3	7.73E+00
75-12-7	Formamide	2.72E-02	77.05	4	7.71E+01
60-35-5	Acetamide	5.81E-03	16.47	5	1.65E+01
87-86-5	Pentachlorophenol	2.50E-02	70.99	6	7.10E+01
126-73-8	Tributyl phosphate	1.67E-02	47.44	7	4.74E+01
108-95-2	Phenol	1.04E-02	29.37	8	3.48E+01
84-66-2	Diethyl phthalate	5.83E-03	16.54	8	3.48E+01
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	2.06E-02	58.53	8	3.48E+01
62-75-9	N-Nitroso-N,N-dimethylamine	2.42E-03	6.86	9	6.86E+00
122-39-4	N,N-Diphenylamine	9.65E-05	0.27	10	1.38E-01
8001-35-2	Toxaphene	9.31E-07	0.00	10	1.38E-01
4170-30-3	2-Butenaldehyde (2-Butenal)	1.28E-05	0.04	11	1.24E-01
58-90-2	2,3,4,6-Tetrachlorophenol	6.86E-05	0.19	11	1.24E-01
98-86-2	Acetophenone	4.94E-05	0.14	11	1.24E-01
57-14-7	1,1-Dimethylhydrazine	3.45E-05	0.10	12	9.79E-02
120-12-7	Anthracene	9.40E-07	0.00	13	2.71E-03
75-05-8	Acetonitrile	9.73E-07	0.00	13	2.71E-03
208-96-8	A	1.13E-07	0.00	14	3.20E-04
132-64-9	Dibenzofuran	5.68E-09	0.00	15	1.61E-05
106-93-4	Ethylene dibromide (Dibromethane)	1.12E-11	0.00	16	1.06E-08
76-44-8	Heptachlor	0.00E+00	0.00	16	1.06E-08
91-20-3	Naphthalene	0.00E+00	0.00	16	1.06E-08
120-82-1	1,2,4-Trichlorobenzene	0.00E+00	0.00	17	0.00E+00
118-74-1	Hexachlorobenzene	0.00E+00	0.00	18	0.00E+00
10061-01-5	cis-1,3-Dichloropropene	0.00E+00	0.00	19	0.00E+00
108-88-3	Toluene	0.00E+00	0.00	19	0.00E+00
71-43-2	Benzene	0.00E+00	0.00	19	0.00E+00
79-01-6	Trichloroethylene	0.00E+00	0.00	20	0.00E+00
87-68-3	Hexachlorobutadiene	0.00E+00	0.00	20	0.00E+00
127-18-4	Perchloroethylene (tetrachloroethylene)	0.00E+00	0.00	21	0.00E+00
56-23-5	Carbon tetrachloride	0.00E+00	0.00	22	0.00E+00
106-99-0	1,3-Butadiene	0.00E+00	0.00	23	0.00E+00
110-82-7	Cyclohexane	0.00E+00	0.00	24	0.00E+00
108-87-2	Methylcyclohexane	0.00E+00	0.00	25	0.00E+00
106-97-8	Butane	0.00E+00	0.00	26	0.00E+00
110-54-3	n-Hexane	0.00E+00	0.00	27	0.00E+00
111-84-2	n-Nonane	0.00E+00	0.00	28	0.00E+00
76-15-3	Chloropentafluoroethane	0.00E+00	0.00	29	0.00E+00
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	3.42E-05	0.10	30	2.39E-01
50-32-8	Benzo(a)pyrene	1.34E-04	0.38	30	2.39E-01
84-74-2	Dibutyl phthalate	2.02E-03	5.73	31	5.73E+00
218-01-9	Chrysene	2.64E-04	0.75	32	4.21E-01
58-89-9	gamma-BHC (Lindane)	5.41E-07	0.00	32	4.21E-01
603-34-9	Triphenylamine	1.81E-04	0.51	32	4.21E-01
129-00-0	Pyrene	4.99E-05	0.14	33	7.11E-02
60-57-1	Dieldrin	2.65E-07	0 00	33	7.11E-02
309-00-2	Aldrin	1 30E-08	0.00	34	3.67E-05
1336-36-3	Polychlorinated biphenyls (PCBs)	6.02E-11	0.00	35	1.71E-07

CF_{HL} = 60 sec/min x 1/ Q_V ft^3/min x 35.315 ft^3/1000 L x 1000 mg/L x 1 ρ kg/L = Concentration mg/kg
CF_{HL} = Conversion Factor
Q_V = Volumetric Flow Rate from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet HLP09 = 7.65E-01 ft^3/min
ρ = Density from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet HLP09 = 1.04E+00 kg/L
Note Un-rounded values for QV and ρ from Sheet HLP09 were used for the calculations.
CF_{HL} = 2652.33539

Q_M = Compound Mass Flow Rate from the Emission Baseline Report (24590-WTP-RPT-PO-03-008), Sheet FEP03
WF_i = Weight Fraction = Q_M * CF_{HL}
Average Weight Fraction WF_a = average WF_i for Henry's Law Group

Table 4. HLW Stream Concentration and Henry's Law Grouping. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

Compound CAS#	Organic Compounds	Compound Mass Flow Rate Q_m g/s	Individual Organic Weight Fraction. WF_i mg/kg	Henry's Law Grouping HL	Henry's Law Group Average Organic Weight Fraction. WF_a mg/kg
100-21-0	p-Phthalic acid	7.49E-03	19.87	1	1.99E+01
88-89-1	Picric acid	9.30E-03	24.68	2	2.47E+01
144-62-7	Oxalic acid	7.51E-04	1.99	3	1.99E+00
75-12-7	Formamide	7.48E-03	19.85	4	1.98E+01
60-35-5	Acetamide	1.66E-03	4.40	5	4.40E+00
87-86-5	Pentachlorophenol	7.54E-03	20.00	6	2.00E+01
126-73-8	Tributyl phosphate	7.59E-03	20.14	7	2.01E+01
108-95-2	Phenol	7.39E-03	19.59	8	2.21E+01
84-66-2	Diethyl phthalate	6.97E-03	18.48	8	2.21E+01
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	1.07E-02	28.29	8	2.21E+01
62-75-9	N-Nitroso-N,N-dimethylamine	1.09E-02	28.81	9	2.88E+01
122-39-4	N,N-Diphenylamine	1.14E-03	3.02	10	1.57E+00
8001-35-2	Toxaphene	4.52E-05	0.12	10	1.57E+00
4170-30-3	2-Butenaldehyde (2-Butenal)	8.77E-04	2.33	11	7.83E+00
58-90-2	2,3,4,6-Tetrachlorophenol	4.09E-03	10.85	11	7.83E+00
98-86-2	Acetophenone	3.89E-03	10.32	11	7.83E+00
57-14-7	1,1-Dimethylhydrazine	3.65E-03	9.67	12	9.67E+00
120-12-7	Anthracene	1.23E-03	3.28	13	2.48E+00
75-05-8	Acetonitrile	6.35E-04	1.69	13	2.48E+00
208-96-8	Acenaphthylene	3.94E-04	1.05	14	1.05E+00
132-64-9	Dibenzofuran	9.06E-05	0.24	15	2.40E-01
106-93-4	Ethylene dibromide (Dibromethane)	2.33E-06	0.01	16	3.04E-03
76-44-8	Heptachlor	7.72E-07	0.00	16	3.04E-03
91-20-3	Naphthalene	3.32E-07	0.00	16	3.04E-03
120-82-1	1,2,4-Trichlorobenzene	2.66E-08	0.00	17	7.06E-05
118-74-1	Hexachlorobenzene	1.22E-09	0.00	18	3.23E-06
10061-01-5	cis-1,3-Dichloropropene	1.66E-09	0.00	19	1.55E-06
108-88-3	Toluene	2.73E-11	0.00	19	1.55E-06
71-43-2	Benzene	6.36E-11	0.00	19	1.55E-06
79-01-6	Trichloroethylene	4.37E-12	0.00	20	1.03E-08
87-68-3	Hexachlorobutadiene	3.44E-12	0.00	20	1.03E-08
127-18-4	Perchloroethylene (tetrachloroethylene)	2.48E-13	0.00	21	6.57E-10
56-23-5	Carbon tetrachloride	2.75E-14	0.00	22	7.29E-11
106-99-0	1,3-Butadiene	2.11E-16	0.00	23	5.60E-13
110-82-7	Cyclohexane	1.24E-24	0.00	24	3.30E-21
108-87-2	Methylcyclohexane	0.00E+00	0.00	25	0.00E+00
106-97-8	Butane	0.00E+00	0.00	26	0.00E+00
110-54-3	n-Hexane	0.00E+00	0.00	27	0.00E+00
111-84-2	n-Nonane	0.00E+00	0.00	28	0.00E+00
76-15-3	Chloropentafluoroethane	0 00E+00	0.00	29	0.00E+00
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	3 15E-05	0.08	30	1.97E-01
50-32-8	Benzo(a)pyrene	1.17E-04	0.31	30	1.97E-01
84-74-2	Dibutyl phthalate	7.33E-03	19.45	31	1.94E+01
218-01-9	Chrysene	5.79E-03	15.36	32	9.24E+00
58-89-9	gamma-BHC (Lindane)	1.99E-05	0.05	32	9.24E+00
603-34-9	Triphenylamine	4.65E-03	12.32	32	9.24E+00
129-00-0	Pyrene	4.82E-03	12.79	33	6.44E+00
60-57-1	Dieldrin	3.51E-05	0.09	33	6.44E+00
309-00-2	Aldrin	3.35E-05	0.09	34	8.88E-02
1336-36-3	Polychlorinated biphenyls (PCBs)	7.98E-05	0.21	35	2.12E-01

C_O = organic concentration; values are from the RPP-WTP Waste Feed Assessment (RPT-24590-EN00003)
ρ = density; values are from RPP-WTP Waste Feed Assessment (RPT-24590-EN00003)
$WF_i = C_O / \rho$
WF_i = the weight fraction of the individual organic compound
WF_S = Sum WF_i
WR_i = the ratio of the individual organic compound weight fraction to the sum of the individual weight fraction = WFi / WF_S
WR_S = Sum WR_i
$R_{IO} = WR_i * ER_{O\text{-}PTF}$; $ER_{O\text{-}PTF}$ is from Table 1
R_{VO} = vapor emissions; R_{VO} is "0" if the compound is a particle or is particle-bound
P = particle; cell has an "X" if the compound is a particle or is particle-bound

Table 5. Estimate of Organic Emissions from the Pretreatment Feed Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compounds	Organic Conc. C_O mg/L	Density ρ kg/L	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
100-00-5	p-Nitrochlorobenzene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
100-21-0	p-Phthalic acid	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
100-25-4	1,4-Dinitrobenzene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
100-41-4	Ethyl benzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
100-42-5	Styrene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
10061-01-5	cis-1,3-Dichloropropene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
10061-02-6	trans-1,3-Dichloropropene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
101-55-3	4-Bromophenylphenyl ether	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
101-84-8	Diphenyl ether	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
106-35-4	3-Heptanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
106-42-3	p-Xylene (Dimethyl benzene)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
106-46-7	1,4-Dichlorobenzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
106-88-7	1,2-Epoxybutane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
106-93-4	Ethylene dibromide (Dibromethane)	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
106-97-8	Butane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
106-99-0	1,3-Butadiene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
107-02-8	Acrolein	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
107-05-1	3-Chloropropene (Allyl chloride)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
107-06-2	1,2-Dichloroethane (Ethylene chloride)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
107-12-0	Propionitrile	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
107-13-1	Acrylonitrile	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
107-18-6	2-Propene-1-ol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
107-31-3	Formic acid, methyl ester	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
107-66-4	Dibutylphosphate	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
107-87-9	2-Pentanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-03-2	1-Nitropropane	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
108-05-4	Vinyl acetate	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-20-3	Bis(isopropyl)ether	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-38-3	m-Xylene (Dimethyl benzene)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-39-4	m-Cresol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-87-2	Methylcyclohexane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-88-3	Toluene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-90-7	Chlorobenzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-93-0	Cyclohexanol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-94-1	Cyclohexanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
108-95-2	Phenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
109-66-0	n-Pentane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
109-99-9	Tetrahydrofuran	39.6	1.35	29.3	3.50E-03	2.57E-06	2.57E-06	
110-12-3	5-Methyl-2-hexanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
110-43-0	2-Heptanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
110-54-3	n-Hexane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
110-62-3	n-Valeraldehyde	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
110-82-7	Cyclohexane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
110-83-8	Cyclohexene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
110-86-1	Pyridine	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
111-65-9	n-Octane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
111-76-2	Ethylene glycol monobutyl ether	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
111-84-2	n-Nonane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
117-84-0	n-Dioctyl phthalate	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
118-74-1	Hexachlorobenzene	1.8	1.35	1.3	1.60E-04	1.20E-07	1.20E-07	

Table 5. Estimate of Organic Emissions from the Pretreatment Feed Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compounds	Organic Conc. C_O mg/L	Density ρ kg/L	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
120-12-7	Anthracene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
120-82-1	1,2,4-Trichlorobenzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
120-83-2	2,4-Dichlorophenol	84.8	1 35	62.8	7.49E-03	5.49E-06	5.49E-06	
121-44-8	Triethylamine	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
121-69-7	Dimethylaniline	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
122-39-4	N,N-Diphenylamine	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
123-19-3	4-Heptanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
123-38-6	n-Propionaldehyde	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
123-51-3	3-Methyl-1-butanol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
123-86-4	Acetic acid n-butyl ester	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
123-91-1	1,4-Dioxane	50.9	1.35	37.7	4.50E-03	3.30E-06	3.30E-06	
126-73-8	Tributyl phosphate	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
127-18-4	Perchloroethylene (tetrachloroethylene)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
127-19-5	N,N-Dimethylacetamide	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
129-00-0	Pyrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
1321-64-8	Pentachloronaphthalene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
1321-65-9	Trichloronaphthalene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
132-64-9	Dibenzofuran	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
1335-87-1	Hexachloronaphthalene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
1335-88-2	Tetrachloronaphthalene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
1336-36-3	Polychlorinated biphenyls (PCBs)	29.4	1.35	21.8	2.60E-03	1.91E-06	0.00E+00	X
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
141-79-7	4-Methyl-3-penten-2-one	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
142-82-5	n-Heptane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
144-62-7	Oxalic acid	8.5	1.35	6.3	7.50E-04	5.50E-07	5.50E-07	
156-60-5	trans-1,2-Dichloroethylene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
1582-09-8	Trifluralin	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
1634-04-4	Methyl tert-butyl ether	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
1836-75-5	Nitrofen	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
189-55-9	Dibenzo[a,i]pyrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
189-64-0	Dibenzo[a,h]pyrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
191-24-2	Benzo(g,h,i)perylene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
191-30-0	Benzo[a,i]pyrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
192-65-4	Dibenzo[a,e]pyrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
193-39-5	Indeno(1,2,3-cd)pyrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
205-82-3	Benzo(j)fluoranthene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
205-99-2	Benzo(b)fluoranthene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
206-44-0	Fluoranthene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
207-08-9	Benzo(k)fluoranthene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
208-96-8	Acenaphthylene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
218-01-9	Chrysene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
2234-13-1	Octachloronaphthalene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
224-42-0	Dibenz[a,j]acridine	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
226-36-8	Dibenz[a,h]acridine	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
2385-85-5	Mirex	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
25551-13-7	Trimethyl benzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
26140-60-3	Terphenyls	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
27154-33-2	Trichlorofluoroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
287-92-3	Cyclopentane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
309-00-2	Aldrin	1	1.35	0.7	9.00E-05	7.00E-08	0.00E+00	X
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	0.3	1.35	0.2	3.00E-05	2.00E-08	2.00E-08	
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	0.3	1.35	0.2	3.00E-05	2.00E-08	0.00E+00	X
319-86-8	Delta-BHC	0.3	1.35	0.2	3.00E-05	2.00E-08	0.00E+00	X
3697-24-3	5-Methylchrysene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
3825-26-1	Ammonium perfluorooctanoate	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
4170-30-3	2-Butenaldehyde (2-Butenal)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
465-73-6	Isodrin	0.6	1.35	0.4	5.00E-05	4.00E-08	4.00E-08	
50-00-0	Formaldehyde	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
50-29-3	4,4-DDT	0.6	1.35	0.4	5.00E-05	4.00E-08	0.00E+00	X
50-32-8	Benzo(a)pyrene	1.1	1.35	0.8	1.00E-04	7.00E-08	0.00E+00	X
53-70-3	Dibenzo(a,h)anthracene	0.1	1.35	0.1	1.00E-05	1.00E-08	0.00E+00	X
540-59-0	1,2-Dichloroethylene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	

Table 5. Estimate of Organic Emissions from the Pretreatment Feed Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compounds	Organic Conc. C_O mg/L	Density ρ kg/L	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
540-84-1	2,2,4-Trimethylpentane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
541-73-1	1,3-Dichlorobenzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
56-23-5	Carbon tetrachloride	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
563-80-4	3-Methyl-2-butanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
56-49-5	3-Methylcholanthrene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
56-55-3	Benzo(a)anthracene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
57-14-7	1,1-Dimethylhydrazine	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
58-89-9	gamma-BHC (Lindane)	0.3	1.35	0.2	3.00E-05	2.00E-08	0.00E+00	X
58-90-2	2,3,4,6-Tetrachlorophenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
591-78-6	2-Hexanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
59-50-7	4-Chloro-3-methylphenol	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
59-89-2	N-Nitrosomorpholine	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
602-87-9	5-Nitroacenaphthene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
60-29-7	Ethyl ether	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
603-34-9	Triphenylamine	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
60-34-4	Methylhydrazine	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
60-35-5	Acetamide	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
60-57-1	Dieldrin	0.6	1.35	0.4	5.00E-05	4.00E-08	0.00E+00	X
621-64-7	Di-n-Propylnitrosamine	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
624-83-9	Methyl isocyanate	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
627-13-4	Nitric acid, propyl ester	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
62-75-9	N-Nitroso-N,N-dimethylamine	158.4	1.35	117.3	1.40E-02	1.03E-05	1.03E-05	
630-20-6	1,1,1,2-Tetrachloroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
64-17-5	Ethyl alcohol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
64-18-6	Formic acid	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
64-19-7	Acetic acid	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
67-56-1	Methyl alcohol (Methanol)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
67-63-0	2-Propyl alcohol (Isopropanol)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
67-64-1	2-Propanone (Acetone)	101.8	1.35	75.4	8.99E-03	6.59E-06	6.59E-06	
67-66-3	Chloroform	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
67-72-1	Hexachloroethane	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
684-16-2	Hexafluoroacetone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
71-23-8	n-Propyl alcohol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
71-36-3	n-Butyl alcohol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
71-43-2	Benzene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
72-20-8	Endrin	0.6	1.35	0.4	5.00E-05	4.00E-08	0.00E+00	X
72-43-5	Methoxychlor	2.8	1.35	2.1	2.50E-04	1.80E-07	0.00E+00	X
72-54-8	4,4-DDD	0.6	1.35	0.4	5.00E-05	4.00E-08	0.00E+00	X
72-55-9	4,4-DDE	0.6	1.35	0.4	5.00E-05	4.00E-08	0.00E+00	X
74-83-9	Bromomethane (Methyl bromide)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
74-87-3	Chloromethane (Methyl chloride)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
74-97-5	Bromochloromethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
74-99-7	Methylacetylene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
75-00-3	Chloroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-01-4	Vinyl chloride (1-Chloroethene)	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
75-05-8	Acetonitrile	26.6	1.35	19.7	2.35E-03	1.72E-06	1.72E-06	
75-07-0	Acetaldehyde	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
75-09-2	Dichloromethane (Methylene chloride)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-12-7	Formamide	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
75-15-0	Carbon disulfide	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-21-8	Ethylene oxide (Oxirane)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-27-4	Bromodichloromethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-34-3	1,1-Dichloroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-43-4	Dichlorofluoromethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-45-6	Chlorodifluoromethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-50-3	Trimethylamine	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-52-5	Nitromethane	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
75-55-8	2-Methylaziridine	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
75-61-6	Difluorodibromomethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-63-8	Trifluorobromomethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-65-0	2-Methyl-2-propanol	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-69-4	Trichlorofluoromethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	

Table 5. Estimate of Organic Emissions from the Pretreatment Feed Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compounds	Organic Conc. C_O mg/L	Density ρ kg/L	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
75-71-8	Dichlorodifluoromethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
75-99-0	2,2-Dichloropropionic acid	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
76-03-9	Trichloroacetic acid	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
76-15-3	Chloropentafluoroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
76-44-8	Heptachlor	1.8	1.35	1.3	1.60E-04	1.20E-07	1.20E-07	
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
78-87-5	1,2-Dichloropropane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
78-92-2	1-Methylpropyl alcohol (2-Butanol)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
79-00-5	1,1,2-Trichloroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
79-01-6	Trichloroethylene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
79-09-4	Propionic acid	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
79-10-7	2-Propenoic acid	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
79-20-9	Methyl acetate	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
79-34-5	1,1,2,2-Tetrachloroethane	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
8001-35-2	Toxaphene	0.7	1.35	0.5	6.00E-05	4.00E-08	0.00E+00	X
82-68-8	Pentachloronitrobenzene (PCBN)	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
83-32-9	Acenaphthene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
84-66-2	Diethyl phthalate	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
84-74-2	Dibutyl phthalate	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
85-01-8	Phenanthrene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
85-68-7	Butylbenzyl phthalate	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
86-73-7	Fluorene	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
87-68-3	Hexachlorobutadiene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
87-86-5	Pentachlorophenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
88-06-2	2,4,6-Trichlorophenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
88-72-2	2-Nitrotoluene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
88-75-5	2-Nitrophenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
88-89-1	Picric acid	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
91-20-3	Naphthalene	2.8	1.35	2.1	2.50E-04	1.80E-07	1.80E-07	
91-22-5	Quinoline	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
91-58-7	2-Chloronapthalene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
92-52-4	1,1`-Biphenyl	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
92-93-3	4-Nitrobiphenyl	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
93-72-1	Silvex (2,4,5-TP)	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
93-76-5	2,4,5-T	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
94-75-7	2,4-D and esters (160C typed)	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
95-13-6	Indene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
95-47-6	o-Xylene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
95-48-7	o-Cresol (2-Methylphenol)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
95-49-8	2-Chlorotoluene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
95-57-8	2-Chlorophenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
95-95-4	2,4,5-Trichlorophenol	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
96-22-0	3-Pentanone	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	84.8	1.35	62.8	7.49E-03	5.49E-06	0.00E+00	X
98-51-1	p-tert-Butyltoluene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
98-82-8	Cumene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
98-83-9	alpha-Methylstyrene	18.7	1.35	13.9	1.65E-03	1.21E-06	1.21E-06	
98-86-2	Acetophenone	84.8	1 35	62.8	7.49E-03	5.49E-06	5.49E-06	
98-95-3	Nitrobenzene	84.8	1.35	62.8	7.49E-03	5.49E-06	5.49E-06	
			Weight Fraction Sum = WF_S =	8383.9				
			Weight Ratio Sum = WR_S =		1.0			
			Pretreatment Feed Stream Sum = $ER_{O\text{-}PTF}$ =			7.33E-04		
			Pretreatment Feed Stream Vapor Organic Release Sum = R_{VOS} =				5.11E-04	

HL = Henry's Law Groupings; values for HL are from the Emission Baseline Report (23590-WTP-RPT-PO-03-008)
WF_i = the weight fraction of the individual organic compound; values are assigned from Table 2 based on HL
WF_S = Sum WF_i
WR_i = the ratio of the individual organic compound weight fraction to the sum of the individual weight fraction = WFi / WF_S
WR_S = Sum WR_i
R_{IO} = WR_i * ER_{O-PE}; ER_{O-PE} is from Table 1
R_{VO} = vapor emissions; R_{VO} is "0" if the compound is a particle or is particle-bound
R_{VOS} = Sum R_{VOi}
P = particle; cell has an "X" if the compound is a particle or is particle-bound

Table 6. Estimate of Organic Emissions from the Post-Evaporator Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
100-00-5	p-Nitrochlorobenzene	10	8.11E-01	5.47E-04	4.00E-07	4.00E-07	
100-21-0	p-Phthalic acid	1	5.74E+01	3.87E-02	2.98E-05	2.98E-05	
100-25-4	1,4-Dinitrobenzene	6	5.51E+01	3.72E-02	2.86E-05	0.00E+00	X
100-41-4	Ethyl benzene	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
100-42-5	Styrene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
10061-01-5	cis-1,3-Dichloropropene	19	2.57E-05	0.00E+00	0.00E+00	0.00E+00	
10061-02-6	trans-1,3-Dichloropropene	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
101-55-3	4-Bromophenylphenyl ether	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
101-84-8	Diphenyl ether	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
106-35-4	3-Heptanone	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
106-42-3	p-Xylene (Dimethyl benzene)	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
106-46-7	1,4-Dichlorobenzene	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
106-88-7	1,2-Epoxybutane	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
106-93-4	Ethylene dibromide (Dibromethane)	16	3.33E-03	2.20E-06	2.00E-09	2.00E-09	
106-97-8	Butane	26	9.68E-13	0.00E+00	0.00E+00	0.00E+00	
106-99-0	1,3-Butadiene	23	2.12E-09	0.00E+00	0.00E+00	0.00E+00	
107-02-8	Acrolein	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
107-05-1	3-Chloropropene (Allyl chloride)	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
107-06-2	1,2-Dichloroethane (Ethylene chloride)	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
107-12-0	Propionitrile	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
107-13-1	Acrylonitrile	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
107-18-6	2-Propene-1-ol	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
107-31-3	Formic acid, methyl ester	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
107-66-4	Dibutylphosphate	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
107-87-9	2-Pentanone	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
108-03-2	1-Nitropropane	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
108-05-4	Vinyl acetate	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
108-20-3	Bis(isopropyl)ether	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
108-38-3	m-Xylene (Dimethyl benzene)	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
108-39-4	m-Cresol	9	2.31E+01	1.56E-02	1.20E-05	1.20E-05	
108-87-2	Methylcyclohexane	25	1.08E-11	0.00E+00	0.00E+00	0.00E+00	
108-88-3	Toluene	19	2.31E-06	0.00E+00	0.00E+00	0.00E+00	
108-90-7	Chlorobenzene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
108-93-0	Cyclohexanol	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
108-94-1	Cyclohexanone	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
108-95-2	Phenol	8	3.57E+01	2.41E-02	1.86E-05	1.86E-05	
109-66-0	n-Pentane	26	9.68E-13	0.00E+00	0.00E+00	0.00E+00	
109-99-9	Tetrahydrofuran	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
110-12-3	5-Methyl-2-hexanone	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
110-43-0	2-Heptanone	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
110-54-3	n-Hexane	27	1.47E-13	0.00E+00	0.00E+00	0.00E+00	
110-62-3	n-Valeraldehyde	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
110-82-7	Cyclohexane	24	2.53E-10	0.00E+00	0.00E+00	0.00E+00	
110-83-8	Cyclohexene	22	3.86E-08	0.00E+00	0.00E+00	0.00E+00	

Table 6. Estimate of Organic Emissions from the Post-Evaporator Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
110-86-1	Pyridine	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
111-65-9	n-Octane	28	2.22E-14	0.00E+00	0.00E+00	0.00E+00	
111-76-2	Ethylene glycol monobutyl ether	9	2.31E+01	1.56E-02	1.20E-05	1.20E-05	
111-84-2	n-Nonane	28	2.22E-14	0.00E+00	0.00E+00	0.00E+00	
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
117-84-0	n-Dioctyl phthalate	32	3.47E+00	2.34E-03	1.80E-06	0.00E+00	X
118-74-1	Hexachlorobenzene	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
120-12-7	Anthracene	13	3.12E-01	2.11E-04	1.62E-07	1.62E-07	
120-82-1	1,2,4-Trichlorobenzene	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
120-83-2	2,4-Dichlorophenol	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
121-44-8	Triethylamine	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
121-69-7	Dimethylaniline	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
122-39-4	N,N-Diphenylamine	10	1.58E+00	1.07E-03	8.21E-07	8.21E-07	
123-19-3	4-Heptanone	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
123-38-6	n-Propionaldehyde	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
123-51-3	3-Methyl-1-butanol	12	1.94E+00	1.31E-03	1.01E-06	1.01E-06	
123-86-4	Acetic acid n-butyl ester	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
123-91-1	1,4-Dioxane	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
126-73-8	Tributyl phosphate	7	4.54E+01	3.06E-02	2.36E-05	2.36E-05	
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
127-18-4	Perchloroethylene (tetrachloroethylene)	21	1.43E-07	0.00E+00	0.00E+00	0.00E+00	
127-19-5	N,N-Dimethylacetamide	5	1.24E+01	8.39E-03	6.47E-06	6.47E-06	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	32	3.47E+00	2.34E-03	1.80E-06	1.80E-06	
129-00-0	Pyrene	33	2.63E+00	1.78E-03	1.37E-06	0.00E+00	X
1321-64-8	Pentachloronaphthalene	14	1.05E-01	7.06E-05	5.44E-08	0.00E+00	X
1321-65-9	Trichloronaphthalene	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
132-64-9	Dibenzofuran	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
1335-87-1	Hexachloronaphthalene	14	1.05E-01	7.06E-05	5.44E-08	0.00E+00	X
1335-88-2	Tetrachloronaphthalene	15	3.43E-02	2.31E-05	1.78E-08	0.00E+00	X
1336-36-3	Polychlorinated biphenyls (PCBs)	35	5.97E-02	4.03E-05	3.11E-08	0.00E+00	X
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
141-79-7	4-Methyl-3-penten-2-one	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
142-82-5	n-Heptane	27	1.47E-13	0.00E+00	0.00E+00	0.00E+00	
144-62-7	Oxalic acid	3	5.75E+00	3.88E-03	2.99E-06	2.99E-06	
156-60-5	trans-1,2-Dichloroethylene	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
1582-09-8	Trifluralin	14	1.05E-01	7.06E-05	5.44E-08	0.00E+00	X
1634-04-4	Methyl tert-butyl ether	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
1836-75-5	Nitrofen	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
189-55-9	Dibenzo[a,i]pyrene	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
189-64-0	Dibenzo[a,h]pyrene	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
191-24-2	Benzo(g,h,i)perylene	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
191-30-0	Benzo[a,i]pyrene	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
192-65-4	Dibenzo[a,e]pyrene	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
193-39-5	Indeno(1,2,3-cd)pyrene	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
205-82-3	Benzo(j)fluoranthene	7	4.54E+01	3.06E-02	2.36E-05	0.00E+00	X
205-99-2	Benzo(b)fluoranthene	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
206-44-0	Fluoranthene	33	1.33E+00	8.96E-04	6.90E-07	0.00E+00	X
207-08-9	Benzo(k)fluoranthene	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
208-96-8	Acenaphthylene	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
218-01-9	Chrysene	32	5.81E+00	3.92E-03	3.02E-06	0.00E+00	X
2234-13-1	Octachloronaphthalene	14	1.05E-01	7.06E-05	5.44E-08	0.00E+00	X
224-42-0	Dibenz[a,j]acridine	4	5.72E+01	3.86E-02	2.97E-05	0.00E+00	X
226-36-8	Dibenz[a,h]acridine	4	5.72E+01	3.86E-02	2.97E-05	0.00E+00	X
2385-85-5	Mirex	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
25551-13-7	Trimethyl benzene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
26140-60-3	Terphenyls	34	8.98E-03	6.10E-06	4.70E-09	0.00E+00	X
27154-33-2	Trichlorofluoroethane	23	2.12E-09	0.00E+00	0.00E+00	0.00E+00	

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CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
287-92-3	Cyclopentane	24	2.53E-10	0.00E+00	0.00E+00	0.00E+00	
309-00-2	Aldrin	34	8.98E-03	6.10E-06	4.70E-09	0.00E+00	X
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	33	1.33E+00	8.96E-04	6.90E-07	6.90E-07	
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	30	1.38E-01	9.34E-05	7.20E-08	0.00E+00	X
319-86-8	Delta-BHC	30	3.21E-01	2.17E-04	1.67E-07	0.00E+00	X
3697-24-3	5-Methylchrysene	32	3.47E+00	2.34E-03	1.80E-06	0.00E+00	X
3825-26-1	Ammonium perfluorooctanoate	14	1.05E-01	7.06E-05	5.44E-08	0.00E+00	X
4170-30-3	2-Butenaldehyde (2-Butenal)	11	5.58E-01	3.77E-04	2.90E-07	2.90E-07	
465-73-6	Isodrin	35	5.97E-02	4.03E-05	3.11E-08	3.11E-08	
50-00-0	Formaldehyde	8	3.49E+01	2.35E-02	1.81E-05	1.81E-05	
50-29-3	4,4-DDT	33	1.33E+00	8.96E-04	6.90E-07	0.00E+00	X
50-32-8	Benzo(a)pyrene	30	5.04E-01	3.40E-04	2.62E-07	0.00E+00	X
53-70-3	Dibenzo(a,h)anthracene	7	4.54E+01	3.06E-02	2.36E-05	0.00E+00	X
540-59-0	1,2-Dichloroethylene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
540-84-1	2,2,4-Trimethylpentane	28	2.22E-14	0.00E+00	0.00E+00	0.00E+00	
541-73-1	1,3-Dichlorobenzene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
56-23-5	Carbon tetrachloride	22	3.86E-08	0.00E+00	0.00E+00	0.00E+00	
563-80-4	3-Methyl-2-butanone	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
56-49-5	3-Methylcholanthrene	28	2.22E-14	0.00E+00	0.00E+00	0.00E+00	X
56-55-3	Benzo(a)anthracene	33	1.33E+00	8.96E-04	6.90E-07	0.00E+00	X
57-14-7	1,1-Dimethylhydrazine	12	1.94E+00	1.31E-03	1.01E-06	1.01E-06	
58-89-9	gamma-BHC (Lindane)	32	2.06E-02	1.39E-05	1.07E-08	0.00E+00	X
58-90-2	2,3,4,6-Tetrachlorophenol	11	2.78E+00	1.88E-03	1.45E-06	1.45E-06	
591-78-6	2-Hexanone	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
59-50-7	4-Chloro-3-methylphenol	32	3.47E+00	2.34E-03	1.80E-06	0.00E+00	X
59-89-2	N-Nitrosomorpholine	6	5.51E+01	3.72E-02	2.86E-05	2.86E-05	
602-87-9	5-Nitroacenaphthene	9	2.31E+01	1.56E-02	1.20E-05	0.00E+00	X
60-29-7	Ethyl ether	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
603-34-9	Triphenylamine	32	4.57E+00	3.08E-03	2.37E-06	2.37E-06	
60-34-4	Methylhydrazine	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
60-35-5	Acetamide	5	1.24E+01	8.39E-03	6.47E-06	6.47E-06	
60-57-1	Dieldrin	33	2.21E-02	1.49E-05	1.15E-08	0.00E+00	X
621-64-7	Di-n-Propylnitrosamine	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
624-83-9	Methyl isocyanate	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
627-13-4	Nitric acid, propyl ester	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
62-75-9	N-Nitroso-N,N-dimethylamine	9	2.31E+01	1.56E-02	1.20E-05	1.20E-05	
630-20-6	1,1,1,2-Tetrachloroethane	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
64-17-5	Ethyl alcohol	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
64-18-6	Formic acid	7	4.54E+01	3.06E-02	2.36E-05	2.36E-05	
64-19-7	Acetic acid	6	5.51E+01	3.72E-02	2.86E-05	2.86E-05	
67-56-1	Methyl alcohol (Methanol)	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
67-63-0	2-Propyl alcohol (Isopropanol)	11	1.90E+00	1.28E-03	9.90E-07	9.90E-07	
67-64-1	2-Propanone (Acetone)	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
67-66-3	Chloroform	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
67-72-1	Hexachloroethane	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
684-16-2	Hexafluoroacetone	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
71-23-8	n-Propyl alcohol	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
71-36-3	n-Butyl alcohol	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
71-43-2	Benzene	19	3.80E-06	0.00E+00	0.00E+00	0.00E+00	
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	21	1.43E-07	0.00E+00	0.00E+00	0.00E+00	
72-20-8	Endrin	32	3.47E+00	2.34E-03	1.80E-06	0.00E+00	X
72-43-5	Methoxychlor	7	4.54E+01	3.06E-02	2.36E-05	0.00E+00	X
72-54-8	4,4-DDD	32	3.47E+00	2.34E-03	1.80E-06	0.00E+00	X
72-55-9	4,4-DDE	34	8.98E-03	6.10E-06	5.00E-09	0.00E+00	X
74-83-9	Bromomethane (Methyl bromide)	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
74-87-3	Chloromethane (Methyl chloride)	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
74-97-5	Bromochloromethane	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	

Table 6. Estimate of Organic Emissions from the Post-Evaporator Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
74-99-7	Methylacetylene	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
75-00-3	Chloroethane	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
75-01-4	Vinyl chloride (1-Chloroethene)	22	3.86E-08	0.00E+00	0.00E+00	0.00E+00	
75-05-8	Acetonitrile	13	1.86E-01	1.25E-04	9.65E-08	9.65E-08	
75-07-0	Acetaldehyde	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
75-09-2	Dichloromethane (Methylene chloride)	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
75-12-7	Formamide	4	5.72E+01	3.86E-02	2.97E-05	2.97E-05	
75-15-0	Carbon disulfide	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
75-21-8	Ethylene oxide (Oxirane)	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
75-27-4	Bromodichloromethane	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
75-34-3	1,1-Dichloroethane	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	22	3.86E-08	0.00E+00	0.00E+00	0.00E+00	
75-43-4	Dichlorofluoromethane	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
75-45-6	Chlorodifluoromethane	22	3.86E-08	0.00E+00	0.00E+00	0.00E+00	
75-50-3	Trimethylamine	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
75-52-5	Nitromethane	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
75-55-8	2-Methylaziridine	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
75-61-6	Difluorodibromomethane	22	3.86E-08	0.00E+00	0.00E+00	0.00E+00	
75-63-8	Trifluorobromomethane	25	1.08E-11	0.00E+00	0.00E+00	0.00E+00	
75-65-0	2-Methyl-2-propanol	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
75-69-4	Trichlorofluoromethane	23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-71-8	Dichlorodifluoromethane	25	1.08E-11	0.00E+00	0.00E+00	0.00E+00	
75-99-0	2,2-Dichloropropionic acid	6	5.51E+01	3.72E-02	2.86E-05	2.86E-05	
76-03-9	Trichloroacetic acid	5	1.24E+01	8.39E-03	6.47E-06	6.47E-06	
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	24	2.53E-10	0.00E+00	0.00E+00	0.00E+00	
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	23	2.12E-09	0.00E+00	0.00E+00	0.00E+00	
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	25	1.08E-11	0.00E+00	0.00E+00	0.00E+00	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	28	2.22E-14	0.00E+00	0.00E+00	0.00E+00	
76-15-3	Chloropentafluoroethane	29	4.99E-15	0.00E+00	0.00E+00	0.00E+00	
76-44-8	Heptachlor	16	3.92E-04	3.00E-07	0.00E+00	0.00E+00	
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
78-87-5	1,2-Dichloropropane	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
78-92-2	1-Methylpropyl alcohol (2-Butanol)	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
79-00-5	1,1,2-Trichloroethane	17	1.29E-04	1.00E-07	0.00E+00	0.00E+00	
79-01-6	Trichloroethylene	20	7.82E-07	0.00E+00	0.00E+00	0.00E+00	
79-09-4	Propionic acid	8	3.49E+01	2.35E-02	1.81E-05	1.81E-05	
79-10-7	2-Propenoic acid	8	3.49E+01	2.35E-02	1.81E-05	1.81E-05	
79-20-9	Methyl acetate	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
79-34-5	1,1,2,2-Tetrachloroethane	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
8001-35-2	Toxaphene	10	4.17E-02	2.81E-05	2.17E-08	0.00E+00	X
82-68-8	Pentachloronitrobenzene (PCBN)	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
83-32-9	Acenaphthene	15	3.43E-02	2.31E-05	1.78E-08	1.78E-08	
84-66-2	Diethyl phthalate	8	2.67E+01	1.80E-02	1.39E-05	1.39E-05	
84-74-2	Dibutyl phthalate	31	1.53E+01	1.03E-02	7.96E-06	0.00E+00	X
85-01-8	Phenanthrene	13	2.49E-01	1.68E-04	1.29E-07	1.29E-07	
85-68-7	Butylbenzyl phthalate	31	1.53E+01	1.03E-02	7.96E-06	0.00E+00	X
86-73-7	Fluorene	14	1.05E-01	7.06E-05	5.44E-08	0.00E+00	X
87-68-3	Hexachlorobutadiene	20	6.79E-07	0.00E+00	0.00E+00	0.00E+00	
87-86-5	Pentachlorophenol	6	5.51E+01	3.72E-02	2.86E-05	2.86E-05	
88-06-2	2,4,6-Trichlorophenol	10	8.11E-01	5.47E-04	4.21E-07	4.21E-07	
88-72-2	2-Nitrotoluene	12	1.94E+00	1.31E-03	1.01E-06	1.01E-06	
88-75-5	2-Nitrophenol	12	1.94E+00	1.31E-03	1.01E-06	1.01E-06	
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	8	4.23E+01	2.85E-02	2.20E-05	0.00E+00	X
88-89-1	Picric acid	2	7.13E+01	4.81E-02	3.71E-05	0.00E+00	X
91-20-3	Naphthalene	16	2.68E-04	2.00E-07	0.00E+00	0.00E+00	
91-22-5	Quinoline	9	2.31E+01	1.56E-02	1.20E-05	1.20E-05	

Table 6. Estimate of Organic Emissions from the Post-Evaporator Stream. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
91-58-7	2-Chloronapthalene	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
92-52-4	1,1`-Biphenyl	16	1.33E-03	9.00E-07	1.00E-09	1.00E-09	
92-93-3	4-Nitrobiphenyl	10	8.11E-01	5.47E-04	4.21E-07	0.00E+00	X
93-72-1	Silvex (2,4,5-TP)	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
93-76-5	2,4,5-T	5	1.24E+01	8.39E-03	6.47E-06	0.00E+00	X
94-75-7	2,4-D and esters (160C typed)	6	5.51E+01	3.72E-02	2.86E-05	2.86E-05	
95-13-6	Indene	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
95-47-6	o-Xylene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
95-48-7	o-Cresol (2-Methylphenol)	9	2.31E+01	1.56E-02	1.20E-05	1.20E-05	
95-49-8	2-Chlorotoluene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	18	8.05E-06	0.00E+00	0.00E+00	0.00E+00	
95-57-8	2-Chlorophenol	11	1.90E+00	1.28E-03	9.87E-07	9.87E-07	
95-95-4	2,4,5-Trichlorophenol	9	2.31E+01	1.56E-02	1.20E-05	1.20E-05	
96-22-0	3-Pentanone	14	1.05E-01	7.06E-05	5.44E-08	5.44E-08	
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	X
98-51-1	p-tert-Butyltoluene	21	1.43E-07	0.00E+00	0.00E+00	0.00E+00	
98-82-8	Cumene	20	7.31E-07	0.00E+00	0.00E+00	0.00E+00	
98-83-9	alpha-Methylstyrene	19	1.06E-05	0.00E+00	0.00E+00	0.00E+00	
98-86-2	Acetophenone	11	2.36E+00	1.59E-03	1.22E-06	1.22E-06	
98-95-3	Nitrobenzene	12	1.94E+00	1.31E-03	1.01E-06	1.01E-06	
	Weight Fraction Sum = WF_S =		1482.5				
	Weight Ratio Sum = WR_S =			1.0			
	Post-Evaporator Stream Sum = $ER_{O\text{-}PE}$ =				7.70E-04		
	Post-Evaporator Stream Vapor Organic Release Sum = R_{VOS} =					4.61E-04	

Total Pretreatment emissions = the sum of Pretreatment Feed Stream and Post-Evaporator Stream Emissions

$R_{VO} = R_{VO\text{-}PTF} + R_{VO\text{-}PE}$

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Pretreatment Feed Stream Individual Organic Vapor Emission $R_{VO\text{-}PTF}$ gm/s	Post-Evaporator Individual Organic Vapor Emission $R_{VO\text{-}PE}$ gm/s	Total Pretreatment Organic Emission R_{VO} gm/s
100-00-5	p-Nitrochlorobenzene	5.49E-06	4.00E-07	5.89E-06
100-21-0	p-Phthalic acid	5.49E-06	2.98E-05	3.53E-05
100-25-4	1,4-Dinitrobenzene	0.00E+00	0.00E+00	0.00E+00
100-41-4	Ethyl benzene	1.21E-06	0.00E+00	1.21E-06
100-42-5	Styrene	1.21E-06	0.00E+00	1.21E-06
10061-01-5	cis-1,3-Dichloropropene	1.21E-06	0.00E+00	1.21E-06
10061-02-6	trans-1,3-Dichloropropene	1.21E-06	0.00E+00	1.21E-06
101-55-3	4-Bromophenylphenyl ether	5.49E-06	5.44E-08	5.54E-06
101-84-8	Diphenyl ether	1.21E-06	1.00E-09	1.21E-06
106-35-4	3-Heptanone	1.21E-06	5.44E-08	1.26E-06
106-42-3	p-Xylene (Dimethyl benzene)	1.21E-06	0.00E+00	1.21E-06
106-46-7	1,4-Dichlorobenzene	1.21E-06	0.00E+00	1.21E-06
106-88-7	1,2-Epoxybutane	1.21E-06	1.78E-08	1.23E-06
106-93-4	Ethylene dibromide (Dibromethane)	5.49E-06	2.00E-09	5.49E-06
106-97-8	Butane	1.21E-06	0.00E+00	1.21E-06
106-99-0	1,3-Butadiene	1.21E-06	0.00E+00	1.21E-06
107-02-8	Acrolein	1.21E-06	5.44E-08	1.26E-06
107-05-1	3-Chloropropene (Allyl chloride)	1.21E-06	0.00E+00	1.21E-06
107-06-2	1,2-Dichloroethane (Ethylene chloride)	1.21E-06	0.00E+00	1.21E-06
107-12-0	Propionitrile	1.21E-06	1.29E-07	1.34E-06
107-13-1	Acrylonitrile	1.21E-06	5.44E-08	1.26E-06
107-18-6	2-Propene-1-ol	5.49E-06	4.21E-07	5.91E-06
107-31-3	Formic acid, methyl ester	5.49E-06	1.78E-08	5.51E-06
107-66-4	Dibutylphosphate	0.00E+00	0.00E+00	0.00E+00
107-87-9	2-Pentanone	1.21E-06	5.44E-08	1.26E-06
108-03-2	1-Nitropropane	5.49E-06	5.44E-08	5.54E-06
108-05-4	Vinyl acetate	5.49E-06	1.00E-09	5.49E-06
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	1.21E-06	5.44E-08	1.26E-06
108-20-3	Bis(isopropyl)ether	1.21E-06	0.00E+00	1.21E-06
108-38-3	m-Xylene (Dimethyl benzene)	1.21E-06	0.00E+00	1.21E-06
108-39-4	m-Cresol	1.21E-06	1.20E-05	1.32E-05
108-87-2	Methylcyclohexane	1.21E-06	0.00E+00	1.21E-06
108-88-3	Toluene	1.21E-06	0.00E+00	1.21E-06
108-90-7	Chlorobenzene	1.21E-06	0.00E+00	1.21E-06
108-93-0	Cyclohexanol	1.21E-06	4.21E-07	1.63E-06
108-94-1	Cyclohexanone	1.21E-06	9.87E-07	2.20E-06
108-95-2	Phenol	5.49E-06	1.86E-05	2.41E-05
109-66-0	n-Pentane	1.21E-06	0.00E+00	1.21E-06
109-99-9	Tetrahydrofuran	2.57E-06	1.29E-07	2.70E-06

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Pretreatment Feed Stream Individual Organic Vapor Emission $R_{VO\text{-}PTF}$ gm/s	Post-Evaporator Individual Organic Vapor Emission $R_{VO\text{-}PE}$ gm/s	Total Pretreatment Organic Emission R_{VO} gm/s
110-12-3	5-Methyl-2-hexanone	1.21E-06	1.78E-08	1.23E-06
110-43-0	2-Heptanone	1.21E-06	1.78E-08	1.23E-06
110-54-3	n-Hexane	1.21E-06	0.00E+00	1.21E-06
110-62-3	n-Valeraldehyde	5.49E-06	1.78E-08	5.51E-06
110-82-7	Cyclohexane	1.21E-06	0.00E+00	1.21E-06
110-83-8	Cyclohexene	1.21E-06	0.00E+00	1.21E-06
110-86-1	Pyridine	5.49E-06	9.87E-07	6.48E-06
111-65-9	n-Octane	1.21E-06	0.00E+00	1.21E-06
111-76-2	Ethylene glycol monobutyl ether	5.49E-06	1.20E-05	1.75E-05
111-84-2	n-Nonane	1.21E-06	0.00E+00	1.21E-06
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	0.00E+00	0.00E+00	0.00E+00
117-84-0	n-Dioctyl phthalate	0.00E+00	0.00E+00	0.00E+00
118-74-1	Hexachlorobenzene	1.20E-07	0.00E+00	1.20E-07
120-12-7	Anthracene	5.49E-06	1.62E-07	5.65E-06
120-82-1	1,2,4-Trichlorobenzene	1.21E-06	0.00E+00	1.21E-06
120-83-2	2,4-Dichlorophenol	5.49E-06	4.21E-07	5.91E-06
121-44-8	Triethylamine	1.21E-06	1.78E-08	1.23E-06
121-69-7	Dimethylaniline	1.21E-06	1.29E-07	1.34E-06
122-39-4	N,N-Diphenylamine	1.21E-06	8.21E-07	2.03E-06
123-19-3	4-Heptanone	1.21E-06	1.29E-07	1.34E-06
123-38-6	n-Propionaldehyde	1.21E-06	5.44E-08	1.26E-06
123-51-3	3-Methyl-1-butanol	1.21E-06	1.01E-06	2.22E-06
123-86-4	Acetic acid n-butyl ester	5.49E-06	1.00E-09	5.49E-06
123-91-1	1,4-Dioxane	3.30E-06	4.21E-07	3.72E-06
126-73-8	Tributyl phosphate	5.49E-06	2.36E-05	2.91E-05
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	1.21E-06	1.00E-09	1.21E-06
127-18-4	Perchloroethylene (tetrachloroethylene)	1.21E-06	0.00E+00	1.21E-06
127-19-5	N,N-Dimethylacetamide	1.21E-06	6.47E-06	7.68E-06
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	5.49E-06	1.80E-06	7.29E-06
129-00-0	Pyrene	0.00E+00	0.00E+00	0.00E+00
1321-64-8	Pentachloronaphthalene	0.00E+00	0.00E+00	0.00E+00
1321-65-9	Trichloronaphthalene	5.49E-06	1.78E-08	5.51E-06
132-64-9	Dibenzofuran	5.49E-06	1.78E-08	5.51E-06
1335-87-1	Hexachloronaphthalene	0.00E+00	0.00E+00	0.00E+00
1335-88-2	Tetrachloronaphthalene	0.00E+00	0.00E+00	0.00E+00
1336-36-3	Polychlorinated biphenyls (PCBs)	0.00E+00	0.00E+00	0.00E+00
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	5.49E-06	5.44E-08	5.54E-06
141-79-7	4-Methyl-3-penten-2-one	5.49E-06	1.29E-07	5.62E-06
142-82-5	n-Heptane	1.21E-06	0.00E+00	1.21E-06
144-62-7	Oxalic acid	5.50E-07	2.99E-06	3.54E-06
156-60-5	trans-1,2-Dichloroethylene	1.21E-06	0.00E+00	1.21E-06
1582-09-8	Trifluralin	0.00E+00	0.00E+00	0.00E+00
1634-04-4	Methyl tert-butyl ether	1.21E-06	1.00E-09	1.21E-06

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Pretreatment Feed Stream Individual Organic Vapor Emission R_{VO-PTF} gm/s	Post-Evaporator Individual Organic Vapor Emission R_{VO-PE} gm/s	Total Pretreatment Organic Emission R_{VO} gm/s
1836-75-5	Nitrofen	0.00E+00	0.00E+00	0.00E+00
189-55-9	Dibenzo[a,i]pyrene	0.00E+00	0.00E+00	0.00E+00
189-64-0	Dibenzo[a,h]pyrene	0.00E+00	0.00E+00	0.00E+00
191-24-2	Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00
191-30-0	Benzo[a,i]pyrene	0.00E+00	0.00E+00	0.00E+00
192-65-4	Dibenzo[a,e]pyrene	0.00E+00	0.00E+00	0.00E+00
193-39-5	Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
205-82-3	Benzo(j)fluoranthene	0.00E+00	0.00E+00	0.00E+00
205-99-2	Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
206-44-0	Fluoranthene	0.00E+00	0.00E+00	0.00E+00
207-08-9	Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
208-96-8	Acenaphthylene	5.49E-06	5.44E-08	5.54E-06
218-01-9	Chrysene	0.00E+00	0.00E+00	0.00E+00
2234-13-1	Octachloronaphthalene	0.00E+00	0.00E+00	0.00E+00
224-42-0	Dibenz[a,j]acridine	0.00E+00	0.00E+00	0.00E+00
226-36-8	Dibenz[a,h]acridine	0.00E+00	0.00E+00	0.00E+00
2385-85-5	Mirex	5.49E-06	0.00E+00	5.49E-06
25551-13-7	Trimethyl benzene	1.21E-06	0.00E+00	1.21E-06
26140-60-3	Terphenyls	0.00E+00	0.00E+00	0.00E+00
27154-33-2	Trichlorofluoroethane	1.21E-06	0.00E+00	1.21E-06
287-92-3	Cyclopentane	1.21E-06	0.00E+00	1.21E-06
309-00-2	Aldrin	0.00E+00	0.00E+00	0.00E+00
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	2.00E-08	6.90E-07	7.10E-07
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	0.00E+00	0.00E+00	0.00E+00
319-86-8	Delta-BHC	0.00E+00	0.00E+00	0.00E+00
3697-24-3	5-Methylchrysene	0.00E+00	0.00E+00	0.00E+00
3825-26-1	Ammonium perfluorooctanoate	0.00E+00	0.00E+00	0.00E+00
4170-30-3	2-Butenaldehyde (2-Butenal)	1.21E-06	2.90E-07	1.50E-06
465-73-6	Isodrin	4.00E-08	3.11E-08	7.11E-08
50-00-0	Formaldehyde	1.21E-06	1.81E-05	1.93E-05
50-29-3	4,4-DDT	0.00E+00	0.00E+00	0.00E+00
50-32-8	Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
53-70-3	Dibenzo(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
540-59-0	1,2-Dichloroethylene	1.21E-06	0.00E+00	1.21E-06
540-84-1	2,2,4-Trimethylpentane	1.21E-06	0.00E+00	1.21E-06
541-73-1	1,3-Dichlorobenzene	1.21E-06	0.00E+00	1.21E-06
56-23-5	Carbon tetrachloride	1.21E-06	0.00E+00	1.21E-06
563-80-4	3-Methyl-2-butanone	1.21E-06	5.44E-08	1.26E-06
56-49-5	3-Methylcholanthrene	0.00E+00	0.00E+00	0.00E+00
56-55-3	Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
57-14-7	1,1-Dimethylhydrazine	5.49E-06	1.01E-06	6.50E-06
58-89-9	gamma-BHC (Lindane)	0.00E+00	0.00E+00	0.00E+00
58-90-2	2,3,4,6-Tetrachlorophenol	5.49E-06	1.45E-06	6.94E-06

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Pretreatment Feed Stream Individual Organic Vapor Emission $R_{VO\text{-}PTF}$ gm/s	Post-Evaporator Individual Organic Vapor Emission $R_{VO\text{-}PE}$ gm/s	Total Pretreatment Organic Emission R_{VO} gm/s
591-78-6	2-Hexanone	1.21E-06	5.44E-08	1.26E-06
59-50-7	4-Chloro-3-methylphenol	0.00E+00	0.00E+00	0.00E+00
59-89-2	N-Nitrosomorpholine	5.49E-06	2.86E-05	3.41E-05
602-87-9	5-Nitroacenaphthene	0.00E+00	0.00E+00	0.00E+00
60-29-7	Ethyl ether	5.49E-06	0.00E+00	5.49E-06
603-34-9	Triphenylamine	5.49E-06	2.37E-06	7.86E-06
60-34-4	Methylhydrazine	1.21E-06	4.21E-07	1.63E-06
60-35-5	Acetamide	1.21E-06	6.47E-06	7.68E-06
60-57-1	Dieldrin	0.00E+00	0.00E+00	0.00E+00
621-64-7	Di-n-Propylnitrosamine	5.49E-06	4.21E-07	5.91E-06
624-83-9	Methyl isocyanate	1.21E-06	0.00E+00	1.21E-06
627-13-4	Nitric acid, propyl ester	5.49E-06	0.00E+00	5.49E-06
62-75-9	N-Nitroso-N,N-dimethylamine	1.03E-05	1.20E-05	2.23E-05
630-20-6	1,1,1,2-Tetrachloroethane	1.21E-06	0.00E+00	1.21E-06
64-17-5	Ethyl alcohol	1.21E-06	4.21E-07	1.63E-06
64-18-6	Formic acid	5.49E-06	2.36E-05	2.91E-05
64-19-7	Acetic acid	5.49E-06	2.86E-05	3.41E-05
67-56-1	Methyl alcohol (Methanol)	1.21E-06	4.21E-07	1.63E-06
67-63-0	2-Propyl alcohol (Isopropanol)	1.21E-06	9.90E-07	2.20E-06
67-64-1	2-Propanone (Acetone)	6.59E-06	1.29E-07	6.72E-06
67-66-3	Chloroform	1.21E-06	0.00E+00	1.21E-06
67-72-1	Hexachloroethane	5.49E-06	0.00E+00	5.49E-06
684-16-2	Hexafluoroacetone	1.21E-06	0.00E+00	1.21E-06
71-23-8	n-Propyl alcohol	1.21E-06	9.87E-07	2.20E-06
71-36-3	n-Butyl alcohol	1.21E-06	9.87E-07	2.20E-06
71-43-2	Benzene	1.21E-06	0.00E+00	1.21E-06
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	1.21E-06	0.00E+00	1.21E-06
72-20-8	Endrin	0.00E+00	0.00E+00	0.00E+00
72-43-5	Methoxychlor	0.00E+00	0.00E+00	0.00E+00
72-54-8	4,4-DDD	0.00E+00	0.00E+00	0.00E+00
72-55-9	4,4-DDE	0.00E+00	0.00E+00	0.00E+00
74-83-9	Bromomethane (Methyl bromide)	1.21E-06	0.00E+00	1.21E-06
74-87-3	Chloromethane (Methyl chloride)	1.21E-06	0.00E+00	1.21E-06
74-97-5	Bromochloromethane	1.21E-06	0.00E+00	1.21E-06
74-99-7	Methylacetylene	5.49E-06	0.00E+00	5.49E-06
75-00-3	Chloroethane	1.21E-06	0.00E+00	1.21E-06
75-01-4	Vinyl chloride (1-Chloroethene)	5.49E-06	0.00E+00	5.49E-06
75-05-8	Acetonitrile	1.72E-06	9.65E-08	1.82E-06
75-07-0	Acetaldehyde	5.49E-06	1.29E-07	5.62E-06
75-09-2	Dichloromethane (Methylene chloride)	1.21E-06	0.00E+00	1.21E-06
75-12-7	Formamide	5.49E-06	2.97E-05	3.52E-05
75-15-0	Carbon disulfide	1.21E-06	0.00E+00	1.21E-06
75-21-8	Ethylene oxide (Oxirane)	1.21E-06	1.78E-08	1.23E-06

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Pretreatment Feed Stream Individual Organic Vapor Emission R_{VO-PTF} gm/s	Post-Evaporator Individual Organic Vapor Emission R_{VO-PE} gm/s	Total Pretreatment Organic Emission R_{VO} gm/s
75-27-4	Bromodichloromethane	1.21E-06	0.00E+00	1.21E-06
75-34-3	1,1-Dichloroethane	1.21E-06	0.00E+00	1.21E-06
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	1.21E-06	0.00E+00	1.21E-06
75-43-4	Dichlorofluoromethane	1.21E-06	0.00E+00	1.21E-06
75-45-6	Chlorodifluoromethane	1.21E-06	0.00E+00	1.21E-06
75-50-3	Trimethylamine	1.21E-06	5.44E-08	1.26E-06
75-52-5	Nitromethane	5.49E-06	1.29E-07	5.62E-06
75-55-8	2-Methylaziridine	5.49E-06	9.87E-07	6.48E-06
75-61-6	Difluorodibromomethane	1.21E-06	0.00E+00	1.21E-06
75-63-8	Trifluorobromomethane	1.21E-06	0.00E+00	1.21E-06
75-65-0	2-Methyl-2-propanol	1.21E-06	9.87E-07	2.20E-06
75-69-4	Trichlorofluoromethane	1.21E-06	0.00E+00	1.21E-06
75-71-8	Dichlorodifluoromethane	1.21E-06	0.00E+00	1.21E-06
75-99-0	2,2-Dichloropropionic acid	5.49E-06	2.86E-05	3.41E-05
76-03-9	Trichloroacetic acid	1.21E-06	6.47E-06	7.68E-06
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	5.49E-06	0.00E+00	5.49E-06
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	5.49E-06	0.00E+00	5.49E-06
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	1.21E-06	0.00E+00	1.21E-06
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	1.21E-06	0.00E+00	1.21E-06
76-15-3	Chloropentafluoroethane	1.21E-06	0.00E+00	1.21E-06
76-44-8	Heptachlor	1.20E-07	0.00E+00	1.20E-07
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	5.49E-06	9.87E-07	6.48E-06
78-87-5	1,2-Dichloropropane	1.21E-06	0.00E+00	1.21E-06
78-92-2	1-Methylpropyl alcohol (2-Butanol)	1.21E-06	9.87E-07	2.20E-06
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	1.21E-06	1.29E-07	1.34E-06
79-00-5	1,1,2-Trichloroethane	1.21E-06	0.00E+00	1.21E-06
79-01-6	Trichloroethylene	1.21E-06	0.00E+00	1.21E-06
79-09-4	Propionic acid	5.49E-06	1.81E-05	2.36E-05
79-10-7	2-Propenoic acid	5.49E-06	1.81E-05	2.36E-05
79-20-9	Methyl acetate	5.49E-06	5.44E-08	5.54E-06
79-34-5	1,1,2,2-Tetrachloroethane	1.21E-06	1.00E-09	1.21E-06
8001-35-2	Toxaphene	0.00E+00	0.00E+00	0.00E+00
82-68-8	Pentachloronitrobenzene (PCBN)	5.49E-06	1.29E-07	5.62E-06
83-32-9	Acenaphthene	5.49E-06	1.78E-08	5.51E-06
84-66-2	Diethyl phthalate	5.49E-06	1.39E-05	1.94E-05
84-74-2	Dibutyl phthalate	0.00E+00	0.00E+00	0.00E+00
85-01-8	Phenanthrene	5.49E-06	1.29E-07	5.62E-06
85-68-7	Butylbenzyl phthalate	0.00E+00	0.00E+00	0.00E+00
86-73-7	Fluorene	0.00E+00	0.00E+00	0.00E+00
87-68-3	Hexachlorobutadiene	1.21E-06	0.00E+00	1.21E-06
87-86-5	Pentachlorophenol	5.49E-06	2.86E-05	3.41E-05
88-06-2	2,4,6-Trichlorophenol	5.49E-06	4.21E-07	5.91E-06
88-72-2	2-Nitrotoluene	1.21E-06	1.01E-06	2.22E-06

Table 7. Estimate of Organic Emissions from Pretreatment Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Pretreatment Feed Stream Individual Organic Vapor Emission $R_{VO\text{-}PTF}$ gm/s	Post-Evaporator Individual Organic Vapor Emission $R_{VO\text{-}PE}$ gm/s	Total Pretreatment Organic Emission R_{VO} gm/s
88-75-5	2-Nitrophenol	5.49E-06	1.01E-06	6.50E-06
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	0.00E+00	0.00E+00	0.00E+00
88-89-1	Picric acid	0.00E+00	0.00E+00	0.00E+00
91-20-3	Naphthalene	1.80E-07	0.00E+00	1.80E-07
91-22-5	Quinoline	5.49E-06	1.20E-05	1.75E-05
91-58-7	2-Chloronapthalene	5.49E-06	1.00E-09	5.49E-06
92-52-4	1,1`-Biphenyl	5.49E-06	1.00E-09	5.49E-06
92-93-3	4-Nitrobiphenyl	0.00E+00	0.00E+00	0.00E+00
93-72-1	Silvex (2,4,5-TP)	0.00E+00	0.00E+00	0.00E+00
93-76-5	2,4,5-T	0.00E+00	0.00E+00	0.00E+00
94-75-7	2,4-D and esters (160C typed)	5.49E-06	2.86E-05	3.41E-05
95-13-6	Indene	5.49E-06	0.00E+00	5.49E-06
95-47-6	o-Xylene	1.21E-06	0.00E+00	1.21E-06
95-48-7	o-Cresol (2-Methylphenol)	1.21E-06	1.20E-05	1.32E-05
95-49-8	2-Chlorotoluene	5.49E-06	0.00E+00	5.49E-06
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	1.21E-06	0.00E+00	1.21E-06
95-57-8	2-Chlorophenol	5.49E-06	9.87E-07	6.48E-06
95-95-4	2,4,5-Trichlorophenol	5.49E-06	1.20E-05	1.75E-05
96-22-0	3-Pentanone	1.21E-06	5.44E-08	1.26E-06
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	0.00E+00	0.00E+00	0.00E+00
98-51-1	p-tert-Butyltoluene	5.49E-06	0.00E+00	5.49E-06
98-82-8	Cumene	5.49E-06	0.00E+00	5.49E-06
98-83-9	alpha-Methylstyrene	1.21E-06	0.00E+00	1.21E-06
98-86-2	Acetophenone	5.49E-06	1.22E-06	6.71E-06
98-95-3	Nitrobenzene	5.49E-06	1.01E-06	6.50E-06
	Sum of column = R_{VOS} =	5.11E-04	4.61E-04	9.72E-04

HL = Henry's Law Groupings; values for HL are from the Emission Baseline Report (23590-WTP-RPT-PO-03-008)
WF_i = the weight fraction of the individual organic compound; values are assigned from Table 3 based on HL
WF_S = Sum WF_i
WR_i = the ratio of the individual organic compound weight fraction to the sum of the individual weight fraction = WFi / WF_S
WR_S = Sum WR_i
R_{IO} = WR_i * ER_{O-LA}; ER_{O-LA} is from Table 1
R_{VO} = vapor emissions; R_{VO} is "0" if the compound is a particle or is particle-bound
R_{VOS} = Sum R_{VOi}
P = particle; cell has an "X" if the compound is a particle or is particle-bound

Table 8. Estimate of Organic Emissions from the LAW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
100-00-5	p-Nitrochlorobenzene	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
100-21-0	p-Phthalic acid	1	7.75E+01	3.16E-02	1.89E-06	1.89E-06	
100-25-4	1,4-Dinitrobenzene	6	7.10E+01	2.89E-02	1.73E-06	0.00E+00	X
100-41-4	Ethyl benzene	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
100-42-5	Styrene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
10061-01-5	cis-1,3-Dichloropropene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
10061-02-6	trans-1,3-Dichloropropene	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
101-55-3	4-Bromophenylphenyl ether	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
101-84-8	Diphenyl ether	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
106-35-4	3-Heptanone	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
106-42-3	p-Xylene (Dimethyl benzene)	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
106-46-7	1,4-Dichlorobenzene	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
106-88-7	1,2-Epoxybutane	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
106-93-4	Ethylene dibromide (Dibromethane)	16	3.17E-08	0.00E+00	0.00E+00	0.00E+00	
106-97-8	Butane	26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
106-99-0	1,3-Butadiene	23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
107-02-8	Acrolein	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
107-05-1	3-Chloropropene (Allyl chloride)	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
107-06-2	1,2-Dichloroethane (Ethylene chloride)	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
107-12-0	Propionitrile	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
107-13-1	Acrylonitrile	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
107-18-6	2-Propene-1-ol	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
107-31-3	Formic acid, methyl ester	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
107-66-4	Dibutylphosphate	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
107-87-9	2-Pentanone	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
108-03-2	1-Nitropropane	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
108-05-4	Vinyl acetate	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
108-20-3	Bis(isopropyl)ether	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
108-38-3	m-Xylene (Dimethyl benzene)	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
108-39-4	m-Cresol	9	6.86E+00	2.79E-03	1.67E-07	1.67E-07	
108-87-2	Methylcyclohexane	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
108-88-3	Toluene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
108-90-7	Chlorobenzene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
108-93-0	Cyclohexanol	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
108-94-1	Cyclohexanone	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
108-95-2	Phenol	8	2.94E+01	1.20E-02	7.17E-07	7.17E-07	
109-66-0	n-Pentane	26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
109-99-9	Tetrahydrofuran	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
110-12-3	5-Methyl-2-hexanone	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
110-43-0	2-Heptanone	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	

Table 8. Estimate of Organic Emissions from the LAW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
110-54-3	n-Hexane	27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
110-62-3	n-Valeraldehyde	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
110-82-7	Cyclohexane	24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
110-83-8	Cyclohexene	22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
110-86-1	Pyridine	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
111-65-9	n-Octane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
111-76-2	Ethylene glycol monobutyl ether	9	6.86E+00	2.79E-03	1.67E-07	1.67E-07	
111-84-2	n-Nonane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
117-84-0	n-Dioctyl phthalate	32	4.21E-01	1.72E-04	1.03E-08	0.00E+00	X
118-74-1	Hexachlorobenzene	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
120-12-7	Anthracene	13	2.67E-03	1.00E-06	6.00E-11	6.00E-11	
120-82-1	1,2,4-Trichlorobenzene	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
120-83-2	2,4-Dichlorophenol	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
121-44-8	Triethylamine	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
121-69-7	Dimethylaniline	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
122-39-4	N,N-Diphenylamine	10	2.74E-01	1.11E-04	6.65E-09	6.65E-09	
123-19-3	4-Heptanone	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
123-38-6	n-Propionaldehyde	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
123-51-3	3-Methyl-1-butanol	12	9.79E-02	4.00E-05	2.40E-09	2.40E-09	
123-86-4	Acetic acid n-butyl ester	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
123-91-1	1,4-Dioxane	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
126-73-8	Tributyl phosphate	7	4.74E+01	1.93E-02	1.16E-06	1.16E-06	
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
127-18-4	Perchloroethylene (tetrachloroethylene)	21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
127-19-5	N,N-Dimethylacetamide	5	1.65E+01	6.71E-03	4.02E-07	4.02E-07	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	32	4.21E-01	1.72E-04	1.03E-08	1.03E-08	
129-00-0	Pyrene	33	1.41E-01	5.80E-05	3.47E-09	0.00E+00	X
1321-64-8	Pentachloronaphthalene	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	X
1321-65-9	Trichloronaphthalene	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
132-64-9	Dibenzofuran	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
1335-87-1	Hexachloronaphthalene	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	X
1335-88-2	Tetrachloronaphthalene	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	X
1336-36-3	Polychlorinated biphenyls (PCBs)	35	1.71E-07	0.00E+00	0.00E+00	0.00E+00	X
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
141-79-7	4-Methyl-3-penten-2-one	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
142-82-5	n-Heptane	27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
144-62-7	Oxalic acid	3	7.73E+00	3.15E-03	1.89E-07	1.89E-07	
156-60-5	trans-1,2-Dichloroethylene	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1582-09-8	Trifluralin	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	X
1634-04-4	Methyl tert-butyl ether	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
1836-75-5	Nitrofen	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
189-55-9	Dibenzo[a,i]pyrene	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
189-64-0	Dibenzo[a,h]pyrene	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
191-24-2	Benzo(g,h,i)perylene	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
191-30-0	Benzo[a,i]pyrene	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
192-65-4	Dibenzo[a,e]pyrene	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
193-39-5	Indeno(1,2,3-cd)pyrene	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
205-82-3	Benzo(j)fluoranthene	7	4.74E+01	1.93E-02	1.16E-06	0.00E+00	X
205-99-2	Benzo(b)fluoranthene	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
206-44-0	Fluoranthene	33	7.11E-02	2.90E-05	1.74E-09	0.00E+00	X
207-08-9	Benzo(k)fluoranthene	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
208-96-8	Acenaphthylene	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	

Table 8. Estimate of Organic Emissions from the LAW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
218-01-9	Chrysene	32	7.49E-01	3.05E-04	1.83E-08	0.00E+00	X
2234-13-1	Octachloronaphthalene	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	X
224-42-0	Dibenz[a,j]acridine	4	7.71E+01	3.14E-02	1.88E-06	0.00E+00	X
226-36-8	Dibenz[a,h]acridine	4	7.71E+01	3.14E-02	1.88E-06	0.00E+00	X
2385-85-5	Mirex	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
25551-13-7	Trimethyl benzene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
26140-60-3	Terphenyls	34	3.67E-05	0.00E+00	0.00E+00	0.00E+00	X
27154-33-2	Trichlorofluoroethane	23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
287-92-3	Cyclopentane	24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
309-00-2	Aldrin	34	3.67E-05	0.00E+00	0.00E+00	0.00E+00	X
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	33	7.11E-02	2.90E-05	1.74E-09	1.74E-09	
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	30	9.70E-02	3.90E-05	2.34E-09	0.00E+00	X
319-86-8	Delta-BHC	30	2.39E-01	9.70E-05	5.81E-09	0.00E+00	X
3697-24-3	5-Methylchrysene	32	4.21E-01	1.72E-04	1.03E-08	0.00E+00	X
3825-26-1	Ammonium perfluorooctanoate	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	X
4170-30-3	2-Butenaldehyde (2-Butenal)	11	3.62E-02	1.50E-05	9.00E-10	9.00E-10	
465-73-6	Isodrin	35	1.71E-07	0.00E+00	0.00E+00	0.00E+00	
50-00-0	Formaldehyde	8	3.48E+01	1.42E-02	8.50E-07	8.50E-07	
50-29-3	4,4-DDT	33	7.11E-02	2.90E-05	1.74E-09	0.00E+00	X
50-32-8	Benzo(a)pyrene	30	3.81E-01	1.55E-04	9.28E-09	0.00E+00	X
53-70-3	Dibenzo(a,h)anthracene	7	4.74E+01	1.93E-02	1.16E-06	0.00E+00	X
540-59-0	1,2-Dichloroethylene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
540-84-1	2,2,4-Trimethylpentane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
541-73-1	1,3-Dichlorobenzene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
56-23-5	Carbon tetrachloride	22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
563-80-4	3-Methyl-2-butanone	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
56-49-5	3-Methylcholanthrene	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	X
56-55-3	Benzo(a)anthracene	33	7.11E-02	2.90E-05	1.74E-09	0.00E+00	X
57-14-7	1,1-Dimethylhydrazine	12	9.79E-02	4.00E-05	2.40E-09	2.40E-09	
58-89-9	gamma-BHC (Lindane)	32	1.53E-03	1.00E-06	6.00E-11	0.00E+00	X
58-90-2	2,3,4,6-Tetrachlorophenol	11	1.95E-01	7.90E-05	4.73E-09	4.73E-09	
591-78-6	2-Hexanone	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
59-50-7	4-Chloro-3-methylphenol	32	4.21E-01	1.72E-04	1.03E-08	0.00E+00	X
59-89-2	N-Nitrosomorpholine	6	7.10E+01	2.89E-02	1.73E-06	1.73E-06	
602-87-9	5-Nitroacenaphthene	9	6.86E+00	2.79E-03	1.67E-07	0.00E+00	X
60-29-7	Ethyl ether	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
603-34-9	Triphenylamine	32	5.13E-01	2.09E-04	1.25E-08	1.25E-08	
60-34-4	Methylhydrazine	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
60-35-5	Acetamide	5	1.65E+01	6.71E-03	4.02E-07	4.02E-07	
60-57-1	Dieldrin	33	7.51E-04	0.00E+00	0.00E+00	0.00E+00	X
621-64-7	Di-n-Propylnitrosamine	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
624-83-9	Methyl isocyanate	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
627-13-4	Nitric acid, propyl ester	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
62-75-9	N-Nitroso-N,N-dimethylamine	9	6.86E+00	2.79E-03	1.67E-07	1.67E-07	
630-20-6	1,1,1,2-Tetrachloroethane	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
64-17-5	Ethyl alcohol	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
64-18-6	Formic acid	7	4.74E+01	1.93E-02	1.16E-06	1.16E-06	
64-19-7	Acetic acid	6	7.10E+01	2.89E-02	1.73E-06	1.73E-06	
67-56-1	Methyl alcohol (Methanol)	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
67-63-0	2-Propyl alcohol (Isopropanol)	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
67-64-1	2-Propanone (Acetone)	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
67-66-3	Chloroform	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
67-72-1	Hexachloroethane	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

Table 8. Estimate of Organic Emissions from the LAW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
684-16-2	Hexafluoroacetone	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
71-23-8	n-Propyl alcohol	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
71-36-3	n-Butyl alcohol	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
71-43-2	Benzene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
72-20-8	Endrin	32	4.21E-01	1.72E-04	1.03E-08	0.00E+00	X
72-43-5	Methoxychlor	7	4.74E+01	1.93E-02	1.16E-06	0.00E+00	X
72-54-8	4,4-DDD	32	4.21E-01	1.72E-04	1.03E-08	0.00E+00	X
72-55-9	4,4-DDE	34	3.67E-05	0.00E+00	0.00E+00	0.00E+00	X
74-83-9	Bromomethane (Methyl bromide)	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
74-87-3	Chloromethane (Methyl chloride)	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
74-97-5	Bromochloromethane	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
74-99-7	Methylacetylene	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-00-3	Chloroethane	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-01-4	Vinyl chloride (1-Chloroethene)	22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-05-8	Acetonitrile	13	2.76E-03	1.00E-06	6.00E-11	6.00E-11	
75-07-0	Acetaldehyde	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
75-09-2	Dichloromethane (Methylene chloride)	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-12-7	Formamide	4	7.71E+01	3.14E-02	1.88E-06	1.88E-06	
75-15-0	Carbon disulfide	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-21-8	Ethylene oxide (Oxirane)	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
75-27-4	Bromodichloromethane	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-34-3	1,1-Dichloroethane	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-43-4	Dichlorofluoromethane	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-45-6	Chlorodifluoromethane	22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-50-3	Trimethylamine	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
75-52-5	Nitromethane	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
75-55-8	2-Methylaziridine	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
75-61-6	Difluorodibromomethane	22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-63-8	Trifluorobromomethane	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-65-0	2-Methyl-2-propanol	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
75-69-4	Trichlorofluoromethane	23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-71-8	Dichlorodifluoromethane	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-99-0	2,2-Dichloropropionic acid	6	7.10E+01	2.89E-02	1.73E-06	1.73E-06	
76-03-9	Trichloroacetic acid	5	1.65E+01	6.71E-03	4.02E-07	4.02E-07	
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-15-3	Chloropentafluoroethane	29	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-44-8	Heptachlor	16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
78-87-5	1,2-Dichloropropane	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
78-92-2	1-Methylpropyl alcohol (2-Butanol)	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
79-00-5	1,1,2-Trichloroethane	17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
79-01-6	Trichloroethylene	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
79-09-4	Propionic acid	8	3.48E+01	1.42E-02	8.50E-07	8.50E-07	
79-10-7	2-Propenoic acid	8	3.48E+01	1.42E-02	8.50E-07	8.50E-07	
79-20-9	Methyl acetate	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
79-34-5	1,1,2,2-Tetrachloroethane	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
8001-35-2	Toxaphene	10	2.64E-03	1.00E-06	6.00E-11	0.00E+00	X

Table 8. Estimate of Organic Emissions from the LAW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
82-68-8	Pentachloronitrobenzene (PCBN)	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
83-32-9	Acenaphthene	15	1.61E-05	0.00E+00	0.00E+00	0.00E+00	
84-66-2	Diethyl phthalate	8	1.65E+01	6.74E-03	4.04E-07	4.04E-07	
84-74-2	Dibutyl phthalate	31	5.73E+00	2.33E-03	1.40E-07	0.00E+00	X
85-01-8	Phenanthrene	13	2.71E-03	1.00E-06	6.00E-11	6.00E-11	
85-68-7	Butylbenzyl phthalate	31	5.73E+00	2.33E-03	1.40E-07	0.00E+00	X
86-73-7	Fluorene	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	X
87-68-3	Hexachlorobutadiene	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
87-86-5	Pentachlorophenol	6	7.10E+01	2.89E-02	1.73E-06	1.73E-06	
88-06-2	2,4,6-Trichlorophenol	10	1.38E-01	5.60E-05	3.35E-09	3.35E-09	
88-72-2	2-Nitrotoluene	12	9.79E-02	4.00E-05	2.40E-09	2.40E-09	
88-75-5	2-Nitrophenol	12	9.79E-02	4.00E-05	2.40E-09	2.40E-09	
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	8	5.85E+01	2.38E-02	1.43E-06	0.00E+00	X
88-89-1	Picric acid	2	1.03E+03	4.20E-01	2.52E-05	0.00E+00	X
91-20-3	Naphthalene	16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
91-22-5	Quinoline	9	6.86E+00	2.79E-03	1.67E-07	1.67E-07	
91-58-7	2-Chloronapthalene	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
92-52-4	1,1`-Biphenyl	16	1.06E-08	0.00E+00	0.00E+00	0.00E+00	
92-93-3	4-Nitrobiphenyl	10	1.38E-01	5.60E-05	3.35E-09	0.00E+00	X
93-72-1	Silvex (2,4,5-TP)	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
93-76-5	2,4,5-T	5	1.65E+01	6.71E-03	4.02E-07	0.00E+00	X
94-75-7	2,4-D and esters (160C typed)	6	7.10E+01	2.89E-02	1.73E-06	1.73E-06	
95-13-6	Indene	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
95-47-6	o-Xylene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
95-48-7	o-Cresol (2-Methylphenol)	9	6.86E+00	2.79E-03	1.67E-07	1.67E-07	
95-49-8	2-Chlorotoluene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
95-57-8	2-Chlorophenol	11	1.24E-01	5.00E-05	3.00E-09	3.00E-09	
95-95-4	2,4,5-Trichlorophenol	9	6.86E+00	2.79E-03	1.67E-07	1.67E-07	
96-22-0	3-Pentanone	14	3.20E-04	0.00E+00	0.00E+00	0.00E+00	
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	X
98-51-1	p-tert-Butyltoluene	21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
98-82-8	Cumene	20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
98-83-9	alpha-Methylstyrene	19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
98-86-2	Acetophenone	11	1.40E-01	5.70E-05	3.41E-09	3.41E-09	
98-95-3	Nitrobenzene	12	9.79E-02	4.00E-05	2.40E-09	2.40E-09	
		Weight Fraction Sum = WF_S =	2454.995				
		Weight Ratio Sum = WR_S =		1.00			
		LAW Stream Sum = $ER_{O\text{-}LA}$ =			5.99E-05		
		LAW Stream Vapor Organic Release Sum = R_{VOS} =				2.09E-05	

HL = Henry's Law Groupings; values for HL are from the Emission Baseline Report (23590-WTP-RPT-PO-03-008)
WF_i = the weight fraction of the individual organic compound; values are assigned from Table 4 based on HL
WF_S = Sum WF_i
WR_i = the ratio of the individual organic compound weight fraction to the sum of the individual weight fraction = WFi / WF_S
WR_S = Sum WR_i
$R_{IO} = WR_i * ER_{O\text{-}HL}$; $ER_{O\text{-}HL}$ is from Table 1
R_{VO} = vapor emissions; R_{VO} is "0" if the compound is a particle or is particle-bound
R_{VOS} = Sum R_{VOi}
P = particle; cell has an "X" if the compound is a particle or is particle-bound

Table 9. Estimate of Organic Emissions from the HLW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
100-00-5	p-Nitrochlorobenzene	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
100-21-0	p-Phthalic acid	1	1.99E+01	1.81E-02	5.16E-07	5.16E-07	
100-25-4	1,4-Dinitrobenzene	6	2.00E+01	1.83E-02	5.22E-07	0.00E+00	X
100-41-4	Ethyl benzene	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
100-42-5	Styrene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
10061-01-5	cis-1,3-Dichloropropene	19	4.41E-06	0.00E+00	0.00E+00	0.00E+00	
10061-02-6	trans-1,3-Dichloropropene	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
101-55-3	4-Bromophenylphenyl ether	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
101-84-8	Diphenyl ether	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
106-35-4	3-Heptanone	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
106-42-3	p-Xylene (Dimethyl benzene)	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
106-46-7	1,4-Dichlorobenzene	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
106-88-7	1,2-Epoxybutane	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
106-93-4	Ethylene dibromide (Dibromethane)	16	6.18E-03	0.00E+00	0.00E+00	0.00E+00	
106-97-8	Butane	26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
106-99-0	1,3-Butadiene	23	5.60E-13	0.00E+00	0.00E+00	0.00E+00	
107-02-8	Acrolein	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
107-05-1	3-Chloropropene (Allyl chloride)	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
107-06-2	1,2-Dichloroethane (Ethylene chloride)	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
107-12-0	Propionitrile	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
107-13-1	Acrylonitrile	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
107-18-6	2-Propene-1-ol	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
107-31-3	Formic acid, methyl ester	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
107-66-4	Dibutylphosphate	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
107-87-9	2-Pentanone	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
108-03-2	1-Nitropropane	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
108-05-4	Vinyl acetate	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
108-10-1	Hexone (4-Methyl-2-pentanone or MIBK)	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
108-20-3	Bis(isopropyl)ether	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
108-38-3	m-Xylene (Dimethyl benzene)	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
108-39-4	m-Cresol	9	2.88E+01	2.63E-02	7.50E-07	7.50E-07	
108-87-2	Methylcyclohexane	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
108-88-3	Toluene	19	7.25E-08	0.00E+00	0.00E+00	0.00E+00	
108-90-7	Chlorobenzene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
108-93-0	Cyclohexanol	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
108-94-1	Cyclohexanone	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
108-95-2	Phenol	8	1.96E+01	1.79E-02	5.11E-07	5.11E-07	
109-66-0	n-Pentane	26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
109-99-9	Tetrahydrofuran	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
110-12-3	5-Methyl-2-hexanone	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
110-43-0	2-Heptanone	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	

Table 9. Estimate of Organic Emissions from the HLW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
110-54-3	n-Hexane	27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
110-62-3	n-Valeraldehyde	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
110-82-7	Cyclohexane	24	3.30E-21	0.00E+00	0.00E+00	0.00E+00	
110-83-8	Cyclohexene	22	7.29E-11	0.00E+00	0.00E+00	0.00E+00	
110-86-1	Pyridine	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
111-65-9	n-Octane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
111-76-2	Ethylene glycol monobutyl ether	9	2.88E+01	2.63E-02	7.50E-07	7.50E-07	
111-84-2	n-Nonane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
117-84-0	n-Dioctyl phthalate	32	9.24E+00	8.40E-03	2.40E-07	0.00E+00	X
118-74-1	Hexachlorobenzene	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
120-12-7	Anthracene	13	3.28E+00	3.00E-03	8.56E-08	8.56E-08	
120-82-1	1,2,4-Trichlorobenzene	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
120-83-2	2,4-Dichlorophenol	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
121-44-8	Triethylamine	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
121-69-7	Dimethylaniline	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
122-39-4	N,N-Diphenylamine	10	3.02E+00	2.80E-03	7.99E-08	7.99E-08	
123-19-3	4-Heptanone	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
123-38-6	n-Propionaldehyde	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
123-51-3	3-Methyl-1-butanol	12	9.67E+00	8.80E-03	2.51E-07	2.51E-07	
123-86-4	Acetic acid n-butyl ester	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
123-91-1	1,4-Dioxane	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
126-73-8	Tributyl phosphate	7	2.01E+01	1.84E-02	5.25E-07	5.25E-07	
126-98-7	2-Methyl-2-propenenitrile (Methacrylonitrile)	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
127-18-4	Perchloroethylene (tetrachloroethylene)	21	6.57E-10	0.00E+00	0.00E+00	0.00E+00	
127-19-5	N,N-Dimethylacetamide	5	4.40E+00	4.00E-03	1.14E-07	1.14E-07	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	32	9.24E+00	8.40E-03	2.40E-07	2.40E-07	
129-00-0	Pyrene	33	1.28E+01	1.17E-02	3.34E-07	0.00E+00	X
1321-64-8		14	1.05E+00	1.00E-03	2.85E-08	0.00E+00	X
1321-65-9	Trichloronaphthalene	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
132-64-9	Dibenzofuran	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
1335-87-1	Hexachloronaphthalene	14	1.05E+00	1.00E-03	2.85E-08	0.00E+00	X
1335-88-2	Tetrachloronaphthalene	15	2.40E-01	2.00E-04	5.70E-09	0.00E+00	X
1336-36-3	Polychlorinated biphenyls (PCBs)	35	2.12E-01	2.00E-04	5.70E-09	0.00E+00	X
141-78-6	Acetic acid ethyl ester (Ethyl acetate)	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
141-79-7	4-Methyl-3-penten-2-one	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
142-82-5	n-Heptane	27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
144-62-7	Oxalic acid	3	1.99E+00	1.80E-03	5.13E-08	5.13E-08	
156-60-5	trans-1,2-Dichloroethylene	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
1582-09-8	Trifluralin	14	1.05E+00	1.00E-03	2.85E-08	0.00E+00	X
1634-04-4	Methyl tert-butyl ether	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
1836-75-5	Nitrofen	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
189-55-9	Dibenzo[a,i]pyrene	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
189-64-0	Dibenzo[a,h]pyrene	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
191-24-2	Benzo(g,h,i)perylene	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
191-30-0	Benzo[a,i]pyrene	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
192-65-4	Dibenzo[a,e]pyrene	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
193-39-5	Indeno(1,2,3-cd)pyrene	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
205-82-3	Benzo(j)fluoranthene	7	2.01E+01	1.84E-02	5.25E-07	0.00E+00	X
205-99-2	Benzo(b)fluoranthene	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
206-44-0	Fluoranthene	33	6.44E+00	5.90E-03	1.68E-07	0.00E+00	X
207-08-9	Benzo(k)fluoranthene	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
208-96-8	Acenaphthylene	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	

Table 9. Estimate of Organic Emissions from the HLW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
218-01-9	Chrysene	32	1.54E+01	1.40E-02	3.99E-07	0.00E+00	X
2234-13-1	Octachloronaphthalene	14	1.05E+00	1.00E-03	2.85E-08	0.00E+00	X
224-42-0	Dibenz[a,j]acridine	4	1.98E+01	1.81E-02	5.16E-07	0.00E+00	X
226-36-8	Dibenz[a,h]acridine	4	1.98E+01	1.81E-02	5.16E-07	0.00E+00	X
2385-85-5	Mirex	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
25551-13-7	Trimethyl benzene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
26140-60-3	Terphenyls	34	8.88E-02	1.00E-04	2.85E-09	0.00E+00	X
27154-33-2	Trichlorofluoroethane	23	5.60E-13	0.00E+00	0.00E+00	0.00E+00	
287-92-3	Cyclopentane	24	3.30E-21	0.00E+00	0.00E+00	0.00E+00	
309-00-2	Aldrin	34	8.88E-02	1.00E-04	2.85E-09	0.00E+00	X
319-84-6	Hexachlorocyclohexane (Lindane) Alpha BHC	33	6.44E+00	5.90E-03	1.68E-07	1.68E-07	
319-85-7	Hexachlorocyclohexane (Lindane) Beta BHC	30	8.35E-02	1.00E-04	2.85E-09	0.00E+00	X
319-86-8	Delta-BHC	30	1.97E-01	2.00E-04	5.70E-09	0.00E+00	X
3697-24-3	5-Methylchrysene	32	9.24E+00	8.40E-03	2.40E-07	0.00E+00	X
3825-26-1	Ammonium perfluorooctanoate	14	1.05E+00	1.00E-03	2.85E-08	0.00E+00	X
4170-30-3	2-Butenaldehyde (2-Butenal or Crotonaldehyde)	11	2.33E+00	2.10E-03	5.99E-08	5.99E-08	
465-73-6	Isodrin	35	2.12E-01	2.00E-04	5.70E-09	5.70E-09	
50-00-0	Formaldehyde	8	2.21E+01	2.02E-02	5.76E-07	5.76E-07	
50-29-3	4,4-DDT	33	6.44E+00	5.90E-03	1.68E-07	0.00E+00	X
50-32-8	Benzo(a)pyrene	30	3.11E-01	3.00E-04	8.56E-09	0.00E+00	X
53-70-3	Dibenzo(a,h)anthracene	7	2.01E+01	1.84E-02	5.25E-07	0.00E+00	X
540-59-0	1,2-Dichloroethylene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
540-84-1	2,2,4-Trimethylpentane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
541-73-1	1,3-Dichlorobenzene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
56-23-5	Carbon tetrachloride	22	7.29E-11	0.00E+00	0.00E+00	0.00E+00	
563-80-4	3-Methyl-2-butanone	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
56-49-5	3-Methylcholanthrene	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	X
56-55-3	Benzo(a)anthracene	33	6.44E+00	5.90E-03	1.68E-07	0.00E+00	X
57-14-7	1,1-Dimethylhydrazine	12	9.67E+00	8.80E-03	2.51E-07	2.51E-07	
58-89-9	gamma-BHC (Lindane)	32	5.28E-02	0.00E+00	0.00E+00	0.00E+00	X
58-90-2	2,3,4,6-Tetrachlorophenol	11	1.08E+01	9.90E-03	2.82E-07	2.82E-07	
591-78-6	2-Hexanone	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
59-50-7	4-Chloro-3-methylphenol	32	9.24E+00	8.40E-03	2.40E-07	0.00E+00	X
59-89-2	N-Nitrosomorpholine	6	2.00E+01	1.83E-02	5.22E-07	5.22E-07	
602-87-9	5-Nitroacenaphthene	9	2.88E+01	2.63E-02	7.50E-07	0.00E+00	X
60-29-7	Ethyl ether	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
603-34-9	Triphenylamine	32	1.23E+01	1.12E-02	3.19E-07	3.19E-07	
60-34-4	Methylhydrazine	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
60-35-5	Acetamide	5	4.40E+00	4.00E-03	1.14E-07	1.14E-07	
60-57-1	Dieldrin	33	9.32E-02	1.00E-04	2.85E-09	0.00E+00	X
621-64-7	Di-n-Propylnitrosamine (N-Nitroso-di-n-propylamine)	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
624-83-9	Methyl isocyanate	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
627-13-4	Nitric acid, propyl ester	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
62-75-9	N-Nitroso-N,N-dimethylamine (Dimethylnitrosamine)	9	2.88E+01	2.63E-02	7.50E-07	7.50E-07	
630-20-6	1,1,1,2-Tetrachloroethane	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
64-17-5	Ethyl alcohol	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
64-18-6	Formic acid	7	2.01E+01	1.84E-02	5.25E-07	5.25E-07	
64-19-7	Acetic acid	6	2.00E+01	1.83E-02	5.22E-07	5.22E-07	
67-56-1	Methyl alcohol (Methanol)	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
67-63-0	2-Propyl alcohol (Isopropanol; Propan-2-01)	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
67-64-1	2-Propanone (Acetone)	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
67-66-3	Chloroform	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
67-72-1	Hexachloroethane	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	

Table 9. Estimate of Organic Emissions from the HLW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
684-16-2	Hexafluoroacetone	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
71-23-8	n-Propyl alcohol	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
71-36-3	n-Butyl alcohol	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
71-43-2	Benzene	19	1.69E-07	0.00E+00	0.00E+00	0.00E+00	
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	21	6.57E-10	0.00E+00	0.00E+00	0.00E+00	
72-20-8	Endrin	32	9.24E+00	8.40E-03	2.40E-07	0.00E+00	X
72-43-5	Methoxychlor	7	2.01E+01	1.84E-02	5.25E-07	0.00E+00	X
72-54-8	4,4-DDD	32	9.24E+00	8.40E-03	2.40E-07	0.00E+00	X
72-55-9	4,4-DDE	34	8.88E-02	1.00E-04	2.85E-09	0.00E+00	X
74-83-9	Bromomethane (Methyl bromide)	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
74-87-3	Chloromethane (Methyl chloride)	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
74-97-5	Bromochloromethane	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
74-99-7	Methylacetylene	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
75-00-3	Chloroethane	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
75-01-4	Vinyl chloride (1-Chloroethene)	22	7.29E-11	0.00E+00	0.00E+00	0.00E+00	
75-05-8	Acetonitrile	13	1.69E+00	1.50E-03	4.28E-08	4.28E-08	
75-07-0	Acetaldehyde	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
75-09-2	Dichloromethane (Methylene chloride)	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
75-12-7	Formamide	4	1.98E+01	1.81E-02	5.16E-07	5.16E-07	
75-15-0	Carbon disulfide	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
75-21-8	Ethylene oxide (Oxirane)	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
75-27-4	Bromodichloromethane	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
75-34-3	1,1-Dichloroethane	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
75-35-4	1,1-Dichloroethene (Vinylidene chloride)	22	7.29E-11	0.00E+00	0.00E+00	0.00E+00	
75-43-4	Dichlorofluoromethane	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
75-45-6	Chlorodifluoromethane	22	7.29E-11	0.00E+00	0.00E+00	0.00E+00	
75-50-3	Trimethylamine	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
75-52-5	Nitromethane	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
75-55-8	2-Methylaziridine	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
75-61-6	Difluorodibromomethane	22	7.29E-11	0.00E+00	0.00E+00	0.00E+00	
75-63-8	Trifluorobromomethane	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-65-0	2-Methyl-2-propanol	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
75-69-4	Trichlorofluoromethane	23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-71-8	Dichlorodifluoromethane	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
75-99-0	2,2-Dichloropropionic acid	6	2.00E+01	1.83E-02	5.22E-07	5.22E-07	
76-03-9	Trichloroacetic acid	5	4.40E+00	4.00E-03	1.14E-07	1.14E-07	
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	24	3.30E-21	0.00E+00	0.00E+00	0.00E+00	
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane	23	5.60E-13	0.00E+00	0.00E+00	0.00E+00	
76-13-1	1,2,2-Trichloro-1,1,2-trifluoroethane (Freon 113)	25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-15-3	Chloropentafluoroethane	29	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
76-44-8	Heptachlor	16	2.05E-03	0.00E+00	0.00E+00	0.00E+00	
78-83-1	2-Methylpropyl alcohol (Isobutyl alcohol)	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
78-87-5	1,2-Dichloropropane	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
78-92-2	1-Methylpropyl alcohol (2-Butanol)	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
78-93-3	Methyl ethyl ketone (MEK, 2-Butanone)	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
79-00-5	1,1,2-Trichloroethane	17	7.06E-05	0.00E+00	0.00E+00	0.00E+00	
79-01-6	Trichloroethylene	20	1.16E-08	0.00E+00	0.00E+00	0.00E+00	
79-09-4	Propionic acid	8	2.21E+01	2.02E-02	5.76E-07	5.76E-07	
79-10-7	2-Propenoic acid	8	2.21E+01	2.02E-02	5.76E-07	5.76E-07	
79-20-9	Methyl acetate	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
79-34-5	1,1,2,2-Tetrachloroethane	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
8001-35-2	Toxaphene	10	1.20E-01	1.00E-04	2.85E-09	0.00E+00	X

Table 9. Estimate of Organic Emissions from the HLW Process Cells. Calc. No. 24590-WTP-HAC-50-00001, Rev. C

CAS#	Organic Compound	Henry's Law Grouping HL	Individual Organic Weight Fraction. WF_i mg/kg	Individual Organic Weight Ratio WR_i unitless	Individual Organic Release R_{IO} gm/s	Individual Organic Vapor Emission R_{VO} gm/s	Particle P
82-68-8	Pentachloronitrobenzene (PCBN or quintobenzene)	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
83-32-9	Acenaphthene	15	2.40E-01	2.00E-04	5.70E-09	5.70E-09	
84-66-2	Diethyl phthalate	8	1.85E+01	1.69E-02	4.82E-07	4.82E-07	
84-74-2	Dibutyl phthalate	31	1.94E+01	1.77E-02	5.05E-07	0.00E+00	X
85-01-8	Phenanthrene	13	2.48E+00	2.30E-03	6.56E-08	6.56E-08	
85-68-7	Butylbenzyl phthalate	31	1.94E+01	1.77E-02	5.05E-07	0.00E+00	X
86-73-7	Fluorene	14	1.05E+00	1.00E-03	2.85E-08	0.00E+00	X
87-68-3	Hexachlorobutadiene	20	9.11E-09	0.00E+00	0.00E+00	0.00E+00	
87-86-5	Pentachlorophenol	6	2.00E+01	1.83E-02	5.22E-07	5.22E-07	
88-06-2	2,4,6-Trichlorophenol	10	1.57E+00	1.40E-03	3.99E-08	3.99E-08	
88-72-2	2-Nitrotoluene	12	9.67E+00	8.80E-03	2.51E-07	2.51E-07	
88-75-5	2-Nitrophenol	12	9.67E+00	8.80E-03	2.51E-07	2.51E-07	
88-85-7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	8	2.83E+01	2.58E-02	7.36E-07	0.00E+00	X
88-89-1	Picric acid	2	2.47E+01	2.25E-02	6.42E-07	0.00E+00	X
91-20-3	Naphthalene	16	8.81E-04	0.00E+00	0.00E+00	0.00E+00	
91-22-5	Quinoline	9	2.88E+01	2.63E-02	7.50E-07	7.50E-07	
91-58-7	2-Chloronapthalene	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
92-52-4	1,1`-Biphenyl	16	3.04E-03	0.00E+00	0.00E+00	0.00E+00	
92-93-3	4-Nitrobiphenyl	10	1.57E+00	1.40E-03	3.99E-08	0.00E+00	X
93-72-1	Silvex (2,4,5-TP)	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
93-76-5	2,4,5-T	5	4.40E+00	4.00E-03	1.14E-07	0.00E+00	X
94-75-7	2,4-D and esters (160C typed)	6	2.00E+01	1.83E-02	5.22E-07	5.22E-07	
95-13-6	Indene	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
95-47-6	o-Xylene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
95-48-7	o-Cresol (2-Methylphenol)	9	2.88E+01	2.63E-02	7.50E-07	7.50E-07	
95-49-8	2-Chlorotoluene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
95-50-1	o-Dichlorobenzene (1,2-Dichlorobenzene)	18	3.23E-06	0.00E+00	0.00E+00	0.00E+00	
95-57-8	2-Chlorophenol	11	7.83E+00	7.10E-03	2.02E-07	2.02E-07	
95-95-4	2,4,5-Trichlorophenol	9	2.88E+01	2.63E-02	7.50E-07	7.50E-07	
96-22-0	3-Pentanone	14	1.05E+00	1.00E-03	2.85E-08	2.85E-08	
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	X
98-51-1	p-tert-Butyltoluene	21	6.57E-10	0.00E+00	0.00E+00	0.00E+00	
98-82-8	Cumene	20	1.03E-08	0.00E+00	0.00E+00	0.00E+00	
98-83-9	alpha-Methylstyrene	19	1.55E-06	0.00E+00	0.00E+00	0.00E+00	
98-86-2	Acetophenone	11	1.03E+01	9.40E-03	2.68E-07	2.68E-07	
98-95-3	Nitrobenzene	12	9.67E+00	8.80E-03	2.51E-07	2.51E-07	
	Weight Fraction Sum = WF_S =		1095.9				
	Weight Ratio Sum = WR_S =			1.00E+00			
	HLW Stream Sum = $ER_{O\text{-}HL}$ =				2.85E-05		
	LAW Stream Vapor Organic Release Sum = R_{VOS} =					1.87E-05	

MASTER DISTRIBUTION SCHEDULE

Document Number	Rev
24590-WTP-HAC-50-00001	C

Name	MSIN	Controlled	Uncontrolled	Size						Comments
						Drawings				
				8 ½ × 11 (A)	11 × 17 (B)	C	D	E	As Is	
NA										

Approver P. Peistrup *Print Name* *Signature* 7/14/03 *Date*