Coal Handling Emissions
***Note: This includes unloading operations, conveying, transfer,**
storage pile load-in, pile wind erosion, pile maintenance and traffic, and pile load-out

Inputs

S =	5	material silt content (%)
u =	7.9	wind speed (mph)
u_e =	1.5	wind speed (mph) - Wind in an enclosure
H =	2	material drop height from unloading device (ft)
H_{T1} =	1	material drop height from bucket unloading device (ft)
M =	5	material moisture content (%)
Y =	6	batch dumping device capacity (yd^3)
Amt. Coal =	95,700	tons/year

BCU1 - Barge/Clamshell Unloading - Technical Guide for Estimating Fugitive Dust: 3-9

$EF = (0.0018 * (S/5) * (u/5) * (H/5)) / ((M/2)^2 * (Y/6)^{1/3})$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material unloaded)
S =	5	material silt content (%) - Technical Guide: 3-24
u =	7.9	wind speed (mph) - 5 yr avg. for Columbus, GA (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Y =	6	batch dumping device capacity (yd^3) - Erie Strayer Co.
Amt. Coal =	95,700	tons/year
Control Eff.	90%	Efficiency with water sprays - Technical Guide: 4-8

EF (lb/ton)		tons/yr		lb/yr	tons/yr
1.82E-05	x	95,700	=	1.74	0.00087

T1 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H_{T1} =	1	material drop height from bucket unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Amt. Coal =	95,700	tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
8.64E-07	x	95,700	=	0.08	0.000041

T3 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Amt. Coal =	95,700	tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
1.73E-06	x	95,700	=	0.17	0.000083

SPL1 - Storage Pile Load-in - Technical Guide for Estimating Fugitive Dust: 3-12

$EF = (0.0018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Control Eff.	75%	Efficiency of telescopic shute: Technical Guide: 4-5
Control Eff.	90%	Efficiency with water sprays - Technical Guide: 4-7
Amt. Coal =	95,700	tons/year

EF (lb/ton)	tons/yr	lb/yr	tons/yr

4.32E-07	x	95,700	=	0.041	0.000021

ASP1 - Active Storage Pile - AP-42, Section 11.9.1
*Note: This calculation is combined for both the coal & pet coke active pile emissions

EF = 0.72 * u

EF =		Emission factor (lb TSP/acre_hr)
u =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
Control Eff.	80%	Efficiency with wind screens - Technical Guide: 4-7
Control Eff.	90%	Efficiency with water sprays - Technical Guide: 4-7

Controlled EF (lb/acre_hr)		Acres		Hours		lb/yr	tons/yr
0.022	x	0.96	x	8,760	=	181	0.090

T5 - Reclaim Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Amt. Coal =	95,700	tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
1.73E-06	x	95,700	=	0.17	0.000083

FPB1 - Fuel Processing Building (Using Transfer Tower Calc.) - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9
Amt. Coal =	95,700	tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
1.73E-07	x	95,700	=	0.017	0.000008

Silo - Transfer - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	50	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9
Amt. Coal =	95,700	tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
4.32E-06	x	95,700	=	0.413	0.00021

Pet Coke Handling Emissions

Pet Coke Emissions
***Note: This includes unloading operations, conveying, transfer,**
storage pile load-in, pile wind erosion, pile maintenance and traffic, and pile load-out

Inputs

S =	5	material silt content (%)
u =	7.9	wind speed (mph)
u_e =	1.5	wind speed (mph) - Wind in an enclosure
H =	2	material drop height from unloading device (ft)
H_{T1} =	1	material drop height from bucket unloading device (ft)
M =	5	material moisture content (%)
Y =	6	batch dumping device capacity (yd^3)
Amt. Pet Coke =	71,260	tons/year

BCU1 - Barge/Clamshell Unloading - Technical Guide for Estimating Fugitive Dust: 3-9

$$EF = (0.0018 * (S/5) * (u/5) * (H/5)) / ((M/2)^2 * (Y/6)^{1/3})$$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material unloaded)
S =	5	material silt content (%) - Technical Guide: 3-24
u =	7.9	wind speed (mph) - 5 yr avg. for Columbus, GA (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Y =	6	batch dumping device capacity (yd^3) - Erie Strayer Co.

Amt. Pet Coke = 71,260 tons/year

Control Eff. 90% Efficiency with water sprays - Technical Guide: 4-8

EF (lb/ton)		tons/yr		lb/yr	tons/yr
1.82E-05	x	71,260	=	1.30	0.00065

T1 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H_{T1} =	1	material drop height from bucket unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24

Amt. Pet Coke = 71,260 tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
8.64E-07	x	71,260	=	0.06	0.000031

T3 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24

Amt. Pet Coke = 71,260 tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
1.73E-06	x	71,260	=	0.12	0.000062

SPL1 - Storage Pile Load-in - Technical Guide for Estimating Fugitive Dust: 3-12

$$EF = (0.0018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24

Control Eff. 75% Efficiency of telescopic shute: Technical Guide: 4-5
Control Eff. 90% Efficiency with water sprays - Technical Guide: 4-7

Amt. Pet Coke = 71,260 tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr

4.32E-07	x	71,260	=	0.031	0.000015

Active Storage Pile - AP-42, Section 11.9.1
*Note: This calculation is combined for both the coal & pet coke active pile emissions (see coal calc.)

T5 - Reclaim Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24

Amt. Pet Coke = 71,260 tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
1.73E-06	x	71,260	=	0.12	0.000062

FPB1 - Fuel Processing Building (Using Transfer Tower Calc.) - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9

Amt. Pet Coke = 71,260 tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
1.73E-07	x	71,260	=	0.012	0.0000062

Silo - Transfer - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	5	material silt content (%) - Technical Guide: 3-24
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	50	material drop height from unloading device (ft) - Estimate
M =	5	material moisture content (%) - Technical Guide: 3-24
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9

Amt. Pet Coke = 71,260 tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
4.32E-06	x	71,260	=	0.308	0.00015

Limestone Handling Emissions
***Note: This includes unloading operations, conveying, transfer, storage pile load-in, pile wind erosion, pile maintenance and traffic, and pile load-out**

Inputs

S =	1.6	material silt content (%)
u =	7.9	wind speed (mph)
u_e =	1.5	wind speed (mph) - Wind in an enclosure
H =	2	material drop height from unloading device (ft)
H_{T1} =	1	material drop height from bucket unloading device (ft)
M =	0.7	material moisture content (%)
Y =	6	batch dumping device capacity (yd^3)
Amt. Limestone =	25,000	tons/year

BCU1 - Barge/Clamshell Unloading - Technical Guide for Estimating Fugitive Dust: 3-9

$$EF = (0.0018 * (S/5) * (u/5) * (H/5)) / ((M/2)^2 * (Y/6)^{1/3})$$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material unloaded)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u =	7.9	wind speed (mph) - 5 yr avg. for Columbus, GA (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1
Y =	6	batch dumping device capacity (yd^3) - Erie Strayer Co.

Amt. Limestone = 25,000 tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
2.97E-03	x	25,000	=	74.3	0.037

T1 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H_{T1} =	1	material drop height from bucket unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1

Amt. Limestone = 25,000 tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
1.41E-05	x	25,000	=	0.35	0.00018

T3 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1

Amt. Limestone = 25,000 tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
2.82E-05	x	25,000	=	0.71	0.00035

SPL1 - Storage Pile Load-in - Technical Guide for Estimating Fugitive Dust: 3-12

$$EF = (0.0018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1
Control Eff.	75%	Efficiency of telescopic shute: Technical Guide: 4-5
Control Eff.	90%	Efficiency with water sprays - Technical Guide: 4-7

Amt. Limestone = 25,000 tons/year

EF (lb/ton)	tons/yr	lb/yr	tons/yr

7.05E-06	x	25,000	=	0.18	0.000088

ASP2 - Active Storage Pile - AP-42, Section 11.9.1
*Note: This calculation is combined for both the limestone & sand active pile emissions

EF = 0.72 * u

EF =		Emission factor (lb TSP/acre_hr)
u =	7.9	wind speed (mph) - 5 yr avg. for Columbus, GA (Longleaf Energy)
Control Eff.	95%	Chemical wetting agent - Technical Guide: 4-7

Controlled EF (lb/acre_hr)		Acres		Hours		lb/yr	tons/yr
0.28	x	0.48	x	8,760	=	1,196	0.60

T5 - Reclaim Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1
Amt. Limestone =	25,000	tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
2.82E-05	x	25,000	=	0.705	0.00035

FPB1 - Fuel Processing Building (Using Transfer Tower Calc.) - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9
Amt. Limestone =	25,000	tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
2.82E-06	x	25,000	=	0.071	0.000035

Silo - Transfer - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	1.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	50	material drop height from unloading device (ft) - Estimate
M =	0.7	material moisture content (%) - AP-42 Section 13.2.4-1
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9
Amt. Limestone =	25,000	tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
7.05E-05	x	25,000	=	1.763	0.00088

Sand Handling Emissions
***Note: This includes unloading operations, conveying, transfer,**
storage pile load-in, pile wind erosion, pile maintenance and traffic, and pile load-out

Inputs

S =	2.6	material silt content (%)
u =	7.9	wind speed (mph)
u_e =	1.5	wind speed (mph) - Wind in an enclosure
H =	2	material drop height from unloading device (ft)
H_{T1} =	1	material drop height from bucket unloading device (ft)
M =	7.4	material moisture content (%)
Y =	6	batch dumping device capacity (yd^3)
Amt. Sand =	25,000	tons/year

BCU1 - Barge/Clamshell Unloading - Technical Guide for Estimating Fugitive Dust: 3-9

$EF = (0.0018 * (S/5) * (u/5) * (H/5)) / ((M/2)^2 * (Y/6)^{1/3})$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material unloaded)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u =	7.9	wind speed (mph) - 5 yr avg. for Columbus, GA (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1
Y =	6	batch dumping device capacity (yd^3) - Erie Strayer Co.
Amt. Sand =	25,000	tons/year
Control Eff.	90%	Efficiency with water sprays - Technical Guide: 4-8

EF (lb/ton)		tons/yr		lb/yr	tons/yr
4.32E-06	x	25,000	=	0.11	0.000054

T1 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H_{T1} =	1	material drop height from bucket unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1
Amt. Sand =	25,000	tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
2.05E-07	x	25,000	=	0.0051	0.0000026

T3 - Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1
Amt. Sand =	25,000	tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
4.10E-07	x	25,000	=	0.010	0.0000051

SPL1 - Storage Pile Load-in - Technical Guide for Estimating Fugitive Dust: 3-12

$EF = (0.0018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1
Control Eff.	75%	Efficiency of telescopic shute: Technical Guide: 4-5
Control Eff.	90%	Efficiency with water sprays - Technical Guide: 4-7
Amt. Sand =	25,000	tons/year

EF (lb/ton)	tons/yr	lb/yr	tons/yr

1.03E-07	x	25,000	=	0.0026	0.0000013

ASP2 - Active Storage Pile - AP-42, Section 11.9.1
*Note: This calculation is combined for both the limestone & sand active pile emissions (see limestone calc.)

T5 - Reclaim Conveyor Transfer Tower - Technical Guide for Estimating Fugitive Dust: 3-10

$EF^* = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled* suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1

Amt. Sand = 25,000 tons/year

*Uncontrolled with the exception of the conveyor transfer station enclosure which has an included efficiency of 90%

EF* (lb/ton)		tons/yr		lb/yr	tons/yr
4.10E-07	x	25,000	=	0.0103	0.0000051

FPB1 - Fuel Processing Building (Using Transfer Tower Calc.) - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	2	material drop height from unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9

Amt. Sand = 25,000 tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
4.10E-08	x	25,000	=	0.0010	0.00000051

Silo - Transfer - Point Source - Technical Guide for Estimating Fugitive Dust: 3-10

$EF = (0.00018 * (S/5) * (u/5) * (H/10)) / (M/2)^2$

EF =		uncontrolled suspended particulate (<30 µm diameter) emissions (lb/ton of material transferred)
S =	2.6	material silt content (%) - AP-42 Section 13.2.4-1
u_e =	1.5	wind speed (mph) - Conservative estimate of wind in enclosure (Longleaf Energy)
H =	50	material drop height from unloading device (ft) - Estimate
M =	7.4	material moisture content (%) - AP-42 Section 13.2.4-1
Control Eff.	90%	Efficiency with fabric filters (in addition to existing 90% gives overall 99%) - Technical Guide: 4-9

Amt. Sand = 25,000 tons/year

EF (lb/ton)		tons/yr		lb/yr	tons/yr
1.03E-06	x	25,000	=	0.0256	0.000013

Barge-to-Silo Biomass Handling Emissions

Barge-to-Silo Biomass Handling Emissions - Source Classification Code (SCC) Factors
***Note: This includes unloading operations, conveying, transfer,**
storage pile load-in, pile wind erosion, pile maintenance and traffic, and pile load-out

Process	Pollutant	Factor	
Storage Pile Handling	PM	0.024	lb/ton
	PM-10	0.011	lb/ton
Bin Loading	PM	0.024	lb/ton
	PM-10	0.011	lb/ton
Bin Unloading	PM	0.048	lb/ton
	PM-10	0.022	lb/ton
Amount Biomass		615,820	tons/yr

T1 - Transfer Tower
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded
Control Eff.	99%	Efficiency of full enclosure transfer stations, green chips	
Amt. Biomass =	615,820	tons/yr	

Controlled PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00048	x	615,820	=	295.5936	0.15

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00022	x	615,820	=	135.4804	0.068

Bin Loading - SCC Factors

PM	EF =	0.024	lb/ton unloaded
PM-10	EF =	0.011	lb/ton unloaded
Control Eff.	99%	Efficiency of full enclosure transfer stations, green chips	
Amt. Biomass =	615,820	tons/yr	

Controlled PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00024	x	615,820	=	147.7968	0.074

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00011	x	615,820	=	67.7402	0.034

T2 - Transfer Tower
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded
Control Eff.	99%	Efficiency of full enclosure transfer stations, green chips	
Amt. Biomass =	615,820	tons/yr	

Controlled PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00048	x	615,820	=	296	0.15

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00022	x	615,820	=	135	0.068

ASP3 - Storage Pile Handling (Loading, Storage, and Unloading) - SCC Factors

PM	EF =	0.024	lb/ton unloaded
PM-10	EF =	0.011	lb/ton unloaded
Control Eff.	75%	Efficiency of telescopic chute	
Control Eff.	99%	Efficiency of water sprays, green chips	
Amt. Biomass =	615,820	tons/yr	

Controlled

PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000060	x	615,820	=	36.9	0.018

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.0000275	x	615,820	=	16.94	0.0085

T2 - Transfer Tower
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded

Control Eff. 99% Efficiency of full enclosure transfer stations, green chips

Amt. Biomass = 615,820 tons/yr

Controlled

PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00048	x	615,820	=	295.5936	0.15

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00022	x	615,820	=	135.4804	0.068

FPB1 - Transfer - Point Source
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded

Control Eff. 99.9% Efficiency of full enclosure transfer stations with fabric filters, wet chips

Amt. Biomass = 615,820 tons/yr

Controlled

PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000048	x	615,820	=	29.55936	0.015

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000022	x	615,820	=	13.54804	0.0068

Bin Loading - SCC Factors

PM	EF =	0.024	lb/ton unloaded
PM-10	EF =	0.011	lb/ton unloaded

Control Eff. 99.9% Efficiency of full enclosure transfer stations with fabric filters, green chips

Amt. Biomass = 615,820 tons/yr

Controlled

PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000024	x	615,820	=	14.77968	0.0074

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000011	x	615,820	=	6.77402	0.0034

Silo - Transfer - Point Source
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded

Control Eff. 99.9% Efficiency of baghouse on silo, green chips

Amt. Biomass = 615,820 tons/yr

Controlled

PM					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000048	x	615,820	=	29.55936	0.015

PM-10					
EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000022	x	615,820	=	13.54804	0.0068

Truck-to-Silo Biomass Handling Emissions: AP-42 & SCC Factors
***Note: This includes unloading operations, conveying, transfer,**
storage pile load-in, pile wind erosion, pile maintenance and traffic, and pile load-out

Paved Roads PTE - Paved Road 1 - AP-42 Chapter 13.2.1 v11/06

Paved Road Fugitive Total Suspended Particulate Matter (TSP) & PM10

$E = k * (sL / 2)^a * (W / 3)^b - C$

E =		size-specific emission factor, lb/VMT
k =	0.016	empirical constant given in Table 13.2.1-1 for PM10, lb/VMT
k1 =	0.082	empirical constant given in Table 13.2.1-1 for TSP, lb/VMT
a =	0.65	empirical constant given in Table 13.2.1-4, Eq.1
b =	1.5	empirical constant given in Table 13.2.1-4, Eq.2
sL =	0.015	default limited access road value, g/m^2
Wa =	30	average truck mean vehicle weight, tons
C =	0.00047	emission factor for 1980s vehicle fleet exhaust, brake/tire wear in Table 13.2.1-2, lb/VMT

	365	annual operating days					
VMT =		vehicle miles traveled			road to unloading area =	0.24	miles
VMTa =	5,606	1 truck/car	64	trips/day			
	5,606	VMT/yr					

TSP E (lb/VMT)		VMT/yr		lb/yr	tpy
0.0332	x	5,606	=	186	0.09

PM10 E (lb/VMT)		VMT/yr		lb/yr	tpy
0.0206	x	5,606	=	115	0.058

Paved Roads PTE - Paved Road 2 - AP-42 Chapter 13.2.1 v11/06

Paved Road Fugitive Total Suspended Particulate Matter (TSP) & PM10

$E = k * (sL / 2)^a * (W / 3)^b - C$

E =		size-specific emission factor, lb/VMT
k =	0.016	empirical constant given in Table 13.2.1-1 for PM10, lb/VMT
k1 =	0.082	empirical constant given in Table 13.2.1-1 for TSP, lb/VMT
a =	0.65	empirical constant given in Table 13.2.1-4, Eq.1
b =	1.5	empirical constant given in Table 13.2.1-4, Eq.2
sL =	0.015	default limited access road value, g/m^2
Wa =	21	average truck mean vehicle weight, tons
C =	0.00047	emission factor for 1980s vehicle fleet exhaust, brake/tire wear in Table 13.2.1-2, lb/VMT

	365	annual operating days					
VMT =		vehicle miles traveled			road to unloading area =	0.87	miles
VMTa =	29,850	1 truck/car	94	trips/day	(64 trucks + 30 employees)		
	29,850	VMT/yr					

TSP E (lb/VMT)		VMT/yr		lb/yr	tpy
0.0192	x	29,850	=	574	0.29

PM10 E (lb/VMT)		VMT/yr		lb/yr	tpy
0.0118	x	29,850	=	354	0.177

SCC Factors

Process	**Pollutant**	**Factor**	
Storage Pile Handling	PM	0.024	lb/ton
	PM-10	0.011	lb/ton
Bin Loading	PM	0.024	lb/ton
	PM-10	0.011	lb/ton
Bin Unloading	PM	0.048	lb/ton
	PM-10	0.022	lb/ton
Amount Biomass		923,730	tons/yr

RSP - Reserve Storage Pile Handling (Loading, Storage, and Unloading) - SCC Factors

PM	EF =	0.024	lb/ton unloaded

PM-10 EF = 0.011 lb/ton unloaded

Control Eff. 75% Efficiency of telescopic chute
Control Eff. 99% Efficiency of water sprays, green chips

Amt. Biomass = 923,730 tons/yr

Controlled

PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000060	x	923,730	=	55.4	0.028

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000028	x	923,730	=	25.4	0.013

T6 - Transfer Tower
Bin Unloading - SCC Factors

PM EF = 0.048 lb/ton unloaded
PM-10 EF = 0.022 lb/ton unloaded

Control Eff. 99% Efficiency of full enclosure transfer stations, green chips

Amt. Biomass = 923,730 tons/yr

Controlled

PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00048	x	923,730	=	443	0.22

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00022	x	923,730	=	203	0.10

T7 - Transfer Tower
Bin Unloading - SCC Factors

PM EF = 0.048 lb/ton unloaded
PM-10 EF = 0.022 lb/ton unloaded

Control Eff. 99% Efficiency of full enclosure transfer stations, green chips

Amt. Biomass = 923,730 tons/yr

Controlled

PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00048	x	923,730	=	443	0.22

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00022	x	923,730	=	203	0.10

FPB2 - Transfer - Point Source
Bin Unloading - SCC Factors

PM EF = 0.048 lb/ton unloaded
PM-10 EF = 0.022 lb/ton unloaded

Control Eff. 99.9% Efficiency of full enclosure transfer stations, green chips

Amt. Biomass = 923,730 tons/yr

Uncontrolled

PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000048	x	923,730	=	44.3	0.022

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000022	x	923,730	=	20.3	0.010

Bin Loading - SCC Factors

PM	EF =	0.024	lb/ton unloaded
PM-10	EF =	0.011	lb/ton unloaded

Control Eff. 99.9% Efficiency of full enclosure transfer stations with fabric filter, green chips

Amt. Biomass = 923,730 tons/yr

Controlled PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000024	x	923,730	=	22.2	0.011

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000011	x	923,730	=	10.2	0.0051

ASP4 - Active Storage Pile Handling (Loading, Storage, and Unloading) - SCC Factors

PM	EF =	0.024	lb/ton unloaded
PM-10	EF =	0.011	lb/ton unloaded

Control Eff. 75% Efficiency of telescopic shute
Control Eff. 99% Efficiency of water sprays, enclosure, green chips

Amt. Biomass = 923,730 tons/yr

Controlled PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000060	x	923,730	=	55.4	0.028

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000028	x	923,730	=	25.4	0.013

T8 - Transfer Tower
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded

Control Eff. 99% Efficiency of full enclosure transfer stations, green chips

Amt. Biomass = 923,730 tons/yr

Controlled PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00048	x	923,730	=	443	0.22

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.00022	x	923,730	=	203	0.10

Silo - Transfer - Point Source
Bin Unloading - SCC Factors

PM	EF =	0.048	lb/ton unloaded
PM-10	EF =	0.022	lb/ton unloaded

Control Eff. 99.9% Efficiency of baghouse on silo, green chips

Amt. Biomass = 923,730 tons/yr

Controlled PM EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000048	x	923,730	=	44.3	0.022

PM-10 EF (lb/ton)		tons/yr		lb/yr	tons/yr
0.000022	x	923,730	=	20.3	0.010

Ash Handling Emissions

Ash Handling

100% Biomass

Biomass Total =	1,539,550	tons/yr
Ash % =	1.31%	from YellowPine Fuel Analysis
Ash Total =	20,168	tons/yr

100% Coal

Coal Total =	95,700	tons/yr
Ash % =	13.42%	source?
Ash Total =	12,843	tons/yr

85/15 Biomass/Coal

Ash Total =	19,069	tons/yr

Ash Handling Silo

Drop Operation into Silo, AP-42: 13.2.4, Eq.1

$E = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$

E =		emission factor, 13.2.4-4, lb/ton
k =	0.35	particle size multiplier, <10 µm, 13.2.4-4, dimensionless
U =	1.5	mean wind speed, maximum, 13.2.4-4, mph
M =	12	material moisture content, 13.2.4-4, %

Control Eff. = 99% control efficiency of baghouse

Uncontrolled

PM10 E (lb/ton)		tpy		lb/yr	tpy
1.91E-05	x	20,168	=	0.38	1.92E-04

Baghouse on Silo

PM10 E (lb/ton)		tpy		lb/yr	tpy
1.91E-05	x	20,168	=	0.0038	1.92E-06

Truck Loading

Drop Operation into Trucks, AP-42: 13.2.4, Eq.1

$E = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$

E =		emission factor, 13.2.4-4, lb/ton
k =	0.35	particle size multiplier, <10 µm, 13.2.4-4, dimensionless
U =	1.5	mean wind speed, maximum, 13.2.4-4, mph
M =	12	material moisture content, 13.2.4-4, %

Control Eff. = 99% control efficiency of enclosure

Uncontrolled

PM10 E (lb/ton)		tpy		lb/yr	tpy
1.91E-05	x	20,168	=	0.38	1.92E-04

Enclosure

PM10 E (lb/ton)		tpy		lb/yr	tpy
1.91E-05	x	20,168	=	0.0038	1.92E-06

Cooling Tower Emissions

Cooling Tower Fugitive Emissions

Particulate Matter Emissions from Wet Cooling Towers: AP-42 Section 13.4

TSP Emission Rate = (Recirculating Water Flow Rate) x (TDS concentration) x (Drift Rate) x (Water Density)

Emission Rate =		Particulate matter emissions from the cooling tower are expected to be greater than 10 microns in diameter (PM-10)	
Recirculating Water Flow Rate =	960,000	gallons per hour (based Peace Valley's flow rate and ratio of generating capacity)	
TDS concentration =	1,850	parts per million (AP-42, Table 13.4-2)	
Drift Rate =	0.0010	percent, based on 2 gallons of drift per minute (Mark Sajer, 5 Jan 07)	
Water Density =	8.34	pounds per gallon (density of water)	
TSP Emission Rate =	0.15	lb/hr	(maximum)
	0.65	tons/yr	(maximum)

HAPs/Toxics Emissions
100% Biomass Feedstock

BFB Boiler	
Operating Scenario	100% Biomass
Heat Input (MMBtu/hr)	1,529

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)	Emission Rate (lb/hr)
	Biomass[1]	
1,1,1-Trichloroethane	3.10E-05	4.74E-02
1,2-Dichloroethane	2.90E-05	4.43E-02
1,2-Dichloropropane	3.30E-05	5.05E-02
2,3,7,8-Tetrachlorodibenzo-p-dioxins	8.60E-12	1.31E-08
2,3,7,8-Tetrachlorodibenzo-p-furans	9.00E-11	1.38E-07
2,4,6-Trichlorophenol	2.20E-08	3.36E-05
2,4-Dinitrophenol	1.80E-07	2.75E-04
2,4-Dinitrotoluene	0.00E+00	0.00E+00
2-Chloroacetophenone	0.00E+00	0.00E+00
4-Nitrophenol	1.10E-07	1.68E-04
5-Methyl chrysene	0.00E+00	0.00E+00
Acenaphthene	9.10E-07	1.39E-03
Acenaphthylene	5.00E-06	7.65E-03
Acetaldehyde	8.30E-04	1.27E+00
Acetone	1.90E-04	2.91E-01
Acetophenone	3.20E-09	4.89E-06
Acrolein[2]	7.80E-05	1.19E-01
Aluminum	0.00E+00	0.00E+00
Ammonia	0.00E+00	0.00E+00
Anthracene	3.00E-06	4.59E-03
Antimony	7.90E-06	1.21E-02
Arsenic	2.20E-05	3.36E-02
Barium	1.70E-04	2.60E-01
Benzene	4.20E-03	6.42E+00
Benzo(a)anthracene	6.50E-08	9.94E-05
Benzo(a)pyrene	2.60E-06	3.98E-03
Benzo(b)fluoranthene	1.00E-07	1.53E-04
Benzo(b,j,k)fluoranthene	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	9.30E-08	1.42E-04
Benzo(j,k)fluoranthene	1.60E-07	2.45E-04
Benzo(k)fluoranthene	3.60E-08	5.50E-05
Benzyl chloride	0.00E+00	0.00E+00
Beryllium	1.10E-06	1.68E-03
Biphenyl	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	4.70E-08	7.19E-05
Bromoform	0.00E+00	0.00E+00
Cadmium	4.10E-06	6.27E-03
Carbon disulfide	0.00E+00	0.00E+00
Carbon tetrachloride	4.50E-05	6.88E-02
Chlorine	7.90E-04	1.21E+00
Chlorobenzene	3.30E-05	5.05E-02
Chloroform	2.80E-05	4.28E-02
Chromium	2.10E-05	3.21E-02
Chromium (Hex)	3.50E-06	5.35E-03
Chrysene	3.80E-08	5.81E-05
Cobalt	6.50E-06	9.94E-03
Copper	4.90E-05	7.49E-02
Crotonaldehyde	9.90E-06	1.51E-02
Cumene	0.00E+00	0.00E+00
Cyanide	0.00E+00	0.00E+00
Dimethyl sulfate	0.00E+00	0.00E+00

HAPs/Toxics Emissions
100% Biomass Feedstock

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)	Emission Rate (lb/hr)
Ethyl chloride	0.00E+00	0.00E+00
Ethylbenzene	3.10E-05	4.74E-02
Ethylene dibromide	0.00E+00	0.00E+00
Ethylene dichloride	0.00E+00	0.00E+00
Fluoranthene	1.60E-06	2.45E-03
Fluorene	3.40E-06	5.20E-03
Formaldehyde	4.40E-03	6.73E+00
Hexane	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00
Hydrogen chloride	1.90E-02	2.91E+01
Indeno(1,2,3,c,d)pyrene	8.70E-08	1.33E-04
Iron	9.90E-04	1.51E+00
Isophorone	0.00E+00	0.00E+00
Lead[3]		2.75E-02
Manganese	1.60E-03	2.45E+00
Mercury[3]		5.35E-04
Methane	2.10E-02	3.21E+01
Methyl bromide	1.50E-05	2.29E-02
Methyl chloride	2.30E-05	3.52E-02
Methyl ethyl ketone	5.40E-06	8.26E-03
Methyl hydrazine	0.00E+00	0.00E+00
Methyl methacrylate	0.00E+00	0.00E+00
Methyl tert butyl ether	0.00E+00	0.00E+00
Methylene chloride	0.00E+00	0.00E+00
Molybdenum	2.10E-06	3.21E-03
Naphthalene	9.70E-05	1.48E-01
Nickel	3.30E-05	5.05E-02
PAH	0.00E+00	0.00E+00
PCB	0.00E+00	0.00E+00
Pentachlorophenol	5.10E-08	7.80E-05
Phenanthrene	7.00E-06	1.07E-02
Phenol	5.10E-05	7.80E-02
Phosphorus	2.70E-05	4.13E-02
Propionaldehyde	6.10E-05	9.33E-02
Pyrene	3.70E-06	5.66E-03
Selenium	2.80E-06	4.28E-03
Silver	1.70E-03	2.60E+00
Styrene	1.90E-03	2.91E+00
Tetrachloroethylene	3.80E-05	5.81E-02
Tin	2.30E-05	3.52E-02
Toluene	9.20E-04	1.41E+00
Trichloroethene	3.00E-05	4.59E-02
Vanadium	9.80E-07	1.50E-03
Vinyl acetate	0.00E+00	0.00E+00
Vinyl Chloride	1.80E-05	2.75E-02
Xylenes	2.50E-05	3.82E-02
Yttrium	3.00E-07	4.59E-04
Zinc	4.20E-04	6.42E-01

Notes:

[1] AP-42 Chapter 1.6 - Table 1.6-3 & 1.6-4

[2] Technical Memorandum dated November 1, 2005 from David Dixon to the Maine Air Toxics Initiative Emissions Inventory Subcommittee references a NCASI acrolein emission factor of 7.8 E-05 lb/MMBtu for wood-fired boilers.

[3] Lead and Mercury emission rates are based on BACT determination.

HAPs/Toxics Emissions
85% Biomass, 15% Coal Feedstock

BFB Boiler	
Operating Scenario	85% Biomass, 15% Coal
Heat Input (MMBtu/hr)	1,529

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)		Emission Rate (lb/hr)
	Biomass[1]	Coal[2]	
1,1,1-Trichloroethane	3.10E-05	9.52E-07	4.05E-02
1,2-Dichloroethane	2.90E-05	0.00E+00	3.77E-02
1,2-Dichloropropane	3.30E-05	0.00E+00	4.29E-02
2,3,7,8-Tetrachlorodibenzo-p-dioxins	8.60E-12	6.81E-13	1.13E-08
2,3,7,8-Tetrachlorodibenzo-p-furans	9.00E-11	1.19E-10	1.44E-07
2,4,6-Trichlorophenol	2.20E-08	0.00E+00	2.86E-05
2,4-Dinitrophenol	1.80E-07	0.00E+00	2.34E-04
2,4-Dinitrotoluene	0.00E+00	1.33E-08	3.06E-06
2-Chloroacetophenone	0.00E+00	3.33E-07	7.65E-05
4-Nitrophenol	1.10E-07	0.00E+00	1.43E-04
5-Methyl chrysene	0.00E+00	1.05E-09	2.40E-07
Acenaphthene	9.10E-07	2.43E-08	1.19E-03
Acenaphthylene	5.00E-06	1.19E-08	6.50E-03
Acetaldehyde	8.30E-04	2.71E-05	1.08E+00
Acetone	1.90E-04	0.00E+00	2.47E-01
Acetophenone	3.20E-09	7.14E-07	1.68E-04
Acrolein[3]	7.80E-05	1.38E-05	1.05E-01
Aluminum	0.00E+00	0.00E+00	0.00E+00
Ammonia	0.00E+00	0.00E+00	0.00E+00
Anthracene	3.00E-06	1.00E-08	3.90E-03
Antimony	7.90E-06	8.57E-07	1.05E-02
Arsenic	2.20E-05	1.95E-05	3.31E-02
Barium	1.70E-04	0.00E+00	2.21E-01
Benzene	4.20E-03	6.19E-05	5.47E+00
Benzo(a)anthracene	6.50E-08	3.81E-09	8.54E-05
Benzo(a)pyrene	2.60E-06	1.81E-09	3.38E-03
Benzo(b)fluoranthene	1.00E-07	0.00E+00	1.30E-04
Benzo(b,j,k)fluoranthene	0.00E+00	5.24E-09	1.20E-06
Benzo(g,h,i)perylene	9.30E-08	1.29E-09	1.21E-04
Benzo(j,k)fluoranthene	1.60E-07	0.00E+00	2.08E-04
Benzo(k)fluoranthene	3.60E-08	0.00E+00	4.68E-05
Benzyl chloride	0.00E+00	3.33E-05	7.65E-03
Beryllium	1.10E-06	1.00E-06	1.66E-03
Biphenyl	0.00E+00	8.10E-08	1.86E-05
bis(2-Ethylhexyl)phthalate	4.70E-08	0.00E+00	6.11E-05
Bromoform	0.00E+00	1.86E-06	4.26E-04
Cadmium	4.10E-06	2.43E-06	5.89E-03
Carbon disulfide	0.00E+00	6.19E-06	1.42E-03
Carbon tetrachloride	4.50E-05	0.00E+00	5.85E-02
Chlorine	7.90E-04	0.00E+00	1.03E+00
Chlorobenzene	3.30E-05	1.05E-06	4.31E-02
Chloroform	2.80E-05	2.81E-06	3.70E-02
Chromium	2.10E-05	1.24E-05	7.39E-03
Chromium (Hex)	3.50E-06	3.76E-06	2.82E-02
Chrysene	3.80E-08	4.76E-09	5.05E-05
Cobalt	6.50E-06	4.76E-06	9.54E-03
Copper	4.90E-05	0.00E+00	6.37E-02
Crotonaldehyde	9.90E-06	0.00E+00	1.29E-02
Cumene	0.00E+00	2.52E-07	5.79E-05
Cyanide	0.00E+00	1.19E-04	2.73E-02
Dimethyl sulfate	0.00E+00	2.29E-06	5.24E-04
Ethyl chloride	0.00E+00	2.00E-06	4.59E-04
Ethylbenzene	3.10E-05	4.48E-06	4.13E-02

HAPs/Toxics Emissions
85% Biomass, 15% Coal Feedstock

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)		Emission Rate (lb/hr)
	Biomass[1]	Coal[2]	
Ethylene dibromide	0.00E+00	5.71E-08	1.31E-05
Ethylene dichloride	0.00E+00	1.90E-06	4.37E-04
Fluoranthene	1.60E-06	3.38E-08	2.09E-03
Fluorene	3.40E-06	4.33E-08	4.43E-03
Formaldehyde	4.40E-03	1.14E-05	5.72E+00
Hexane	0.00E+00	3.19E-06	7.32E-04
HF	0.00E+00	3.19E-06	7.32E-04
Hydrogen chloride	1.90E-02	0.00E+00	2.47E+01
Indeno(1,2,3,c,d)pyrene	8.70E-08	2.90E-09	1.14E-04
Iron	9.90E-04	0.00E+00	1.29E+00
Isophorone	0.00E+00	2.76E-05	6.33E-03
Lead[4]			2.75E-02
Manganese	1.60E-03	2.33E-05	2.08E+00
Mercury[4]			5.46E-04
Methane	2.10E-02	0.00E+00	2.73E+01
Methyl bromide	1.50E-05	7.62E-06	2.12E-02
Methyl chloride	2.30E-05	2.52E-05	3.57E-02
Methyl ethyl ketone	5.40E-06	1.86E-05	1.13E-02
Methyl hydrazine	0.00E+00	8.10E-06	1.86E-03
Methyl methacrylate	0.00E+00	9.52E-07	2.18E-04
Methyl tert butyl ether	0.00E+00	1.67E-06	3.82E-04
Methylene chloride	0.00E+00	1.38E-05	3.17E-03
Molybdenum	2.10E-06	0.00E+00	2.73E-03
Naphthalene	9.70E-05	6.19E-07	1.26E-01
Nickel	3.30E-05	1.33E-05	4.59E-02
PAH	0.00E+00	0.00E+00	0.00E+00
PCB	0.00E+00	0.00E+00	0.00E+00
Pentachlorophenol	5.10E-08	0.00E+00	6.63E-05
Phenanthrene	7.00E-06	1.29E-07	9.13E-03
Phenol	5.10E-05	7.62E-07	6.65E-02
Phosphorus	2.70E-05	0.00E+00	3.51E-02
Propionaldehyde	6.10E-05	1.81E-05	8.34E-02
Pyrene	3.70E-06	1.57E-08	4.81E-03
Selenium	2.80E-06	6.19E-05	1.78E-02
Silver	1.70E-03	0.00E+00	2.21E+00
Styrene	1.90E-03	1.19E-06	2.47E+00
Tetrachloroethylene	3.80E-05	2.05E-06	4.99E-02
Tin	2.30E-05	0.00E+00	2.99E-02
Toluene	9.20E-04	1.14E-05	1.20E+00
Trichloroethene	3.00E-05	0.00E+00	3.90E-02
Vanadium	9.80E-07	0.00E+00	1.27E-03
Vinyl acetate	0.00E+00	3.62E-07	8.30E-05
Vinyl Chloride	1.80E-05	0.00E+00	2.34E-02
Xylenes	2.50E-05	1.76E-06	3.29E-02
Yttrium	3.00E-07	0.00E+00	3.90E-04
Zinc	4.20E-04	0.00E+00	5.46E-01

Notes:

[1] AP-42 Chapter 1.6 - Table 1.6-3 & 1.6-4

[2] AP-42 Chapter 1.1 - Table 1.1-13 & 1.1-14 & 1.1-18

[3] Technical Memorandum dated November 1, 2005 from David Dixon to the Maine Air Toxics Initiative Emissions Inventory Subcommittee references a NCASI acrolein emission factor of 7.8 E-05 lb/MMBtu for wood-fired boilers.

[4] Lead and Mercury emission rates are based on BACT determination.

HAPs/Toxics Emissions
85% Biomass, 15% Pet Coke Feedstock

BFB Boiler	
Operating Scenario	85% Biomass, 15% Pet Coke
Heat Input (MMBtu/hr)	1,529

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)		Emission Rate (lb/hr)
	Biomass[1]	Pet Coke[2]	
1,1,1-Trichloroethane	3.10E-05	0.00E+00	4.03E-02
1,2-Dichloroethane	2.90E-05	0.00E+00	3.77E-02
1,2-Dichloropropane	3.30E-05	0.00E+00	4.29E-02
2,3,7,8-Tetrachlorodibenzo-p-dioxins	8.60E-12	0.00E+00	1.12E-08
2,3,7,8-Tetrachlorodibenzo-p-furans	9.00E-11	0.00E+00	1.17E-07
2,4,6-Trichlorophenol	2.20E-08	0.00E+00	2.86E-05
2,4-Dinitrophenol	1.80E-07	0.00E+00	2.34E-04
2,4-Dinitrotoluene	0.00E+00	0.00E+00	0.00E+00
2-Chloroacetophenone	0.00E+00	0.00E+00	0.00E+00
4-Nitrophenol	1.10E-07	0.00E+00	1.43E-04
5-Methyl chrysene	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	9.10E-07	2.17E-08	1.19E-03
Acenaphthylene	5.00E-06	1.41E-08	6.50E-03
Acetaldehyde	8.30E-04	0.00E+00	1.08E+00
Acetone	1.90E-04	0.00E+00	2.47E-01
Acetophenone	3.20E-09	0.00E+00	4.16E-06
Acrolein[3]	7.80E-05	0.00E+00	1.01E-01
Aluminum	0.00E+00	0.00E+00	0.00E+00
Ammonia	0.00E+00	1.30E-02	2.98E+00
Anthracene	3.00E-06	8.30E-09	3.90E-03
Antimony	7.90E-06	0.00E+00	1.03E-02
Arsenic	2.20E-05	1.64E-06	2.90E-02
Barium	1.70E-04	0.00E+00	2.21E-01
Benzene	4.20E-03	5.67E-07	5.46E+00
Benzo(a)anthracene	6.50E-08	8.33E-09	8.64E-05
Benzo(a)pyrene	2.60E-06	7.20E-09	3.38E-03
Benzo(b)fluoranthene	1.00E-07	7.20E-09	1.32E-04
Benzo(b,j,k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	9.30E-08	7.41E-09	1.23E-04
Benzo(j,k)fluoranthene	1.60E-07	0.00E+00	2.08E-04
Benzo(k)fluoranthene	3.60E-08	0.00E+00	4.68E-05
Benzyl chloride	0.00E+00	0.00E+00	0.00E+00
Beryllium	1.10E-06	7.59E-08	1.45E-03
Biphenyl	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	4.70E-08	0.00E+00	6.11E-05
Bromoform	0.00E+00	0.00E+00	0.00E+00
Cadmium	4.10E-06	5.99E-07	5.47E-03
Carbon disulfide	0.00E+00	0.00E+00	0.00E+00
Carbon tetrachloride	4.50E-05	0.00E+00	5.85E-02
Chlorine	7.90E-04	0.00E+00	1.03E+00
Chlorobenzene	3.30E-05	0.00E+00	4.29E-02
Chloroform	2.80E-05	0.00E+00	3.64E-02
Chromium	2.10E-05	3.58E-07	4.63E-03
Chromium (Hex)	3.50E-06	3.30E-07	2.74E-02
Chrysene	3.80E-08	2.04E-08	5.41E-05
Cobalt	6.50E-06	0.00E+00	8.45E-03
Copper	4.90E-05	2.82E-06	6.43E-02
Crotonaldehyde	9.90E-06	0.00E+00	1.29E-02
Cumene	0.00E+00	0.00E+00	0.00E+00
Cyanide	0.00E+00	0.00E+00	0.00E+00
Dimethyl sulfate	0.00E+00	0.00E+00	0.00E+00
Ethyl chloride	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	3.10E-05	0.00E+00	4.03E-02

HAPs/Toxics Emissions
85% Biomass, 15% Pet Coke Feedstock

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)		Emission Rate (lb/hr)
	Biomass[1]	Pet Coke[2]	
Ethylene dibromide	0.00E+00	0.00E+00	0.00E+00
Ethylene dichloride	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	1.60E-06	3.44E-08	2.09E-03
Fluorene	3.40E-06	4.01E-08	4.43E-03
Formaldehyde	4.40E-03	4.01E-08	5.72E+00
Hexane	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	2.52E-05	5.77E-03
Hydrogen chloride	1.90E-02	2.61E-03	2.53E+01
Indeno(1,2,3,c,d)pyrene	8.70E-08	0.00E+00	1.13E-04
Iron	9.90E-04	0.00E+00	1.29E+00
Isophorone	0.00E+00	0.00E+00	0.00E+00
Lead[4]			2.75E-02
Manganese	1.60E-03	4.68E-06	2.08E+00
Mercury[4]			1.47E-03
Methane	2.10E-02	0.00E+00	2.73E+01
Methyl bromide	1.50E-05	0.00E+00	1.95E-02
Methyl chloride	2.30E-05	0.00E+00	2.99E-02
Methyl ethyl ketone	5.40E-06	0.00E+00	7.02E-03
Methyl hydrazine	0.00E+00	0.00E+00	0.00E+00
Methyl methacrylate	0.00E+00	0.00E+00	0.00E+00
Methyl tert butyl ether	0.00E+00	0.00E+00	0.00E+00
Methylene chloride	0.00E+00	0.00E+00	0.00E+00
Molybdenum	2.10E-06	0.00E+00	2.73E-03
Naphthalene	9.70E-05	1.76E-06	1.26E-01
Nickel	3.30E-05	4.40E-06	4.39E-02
PAH	0.00E+00	0.00E+00	0.00E+00
PCB	0.00E+00	0.00E+00	0.00E+00
Pentachlorophenol	5.10E-08	0.00E+00	6.63E-05
Phenanthrene	7.00E-06	1.90E-07	9.14E-03
Phenol	5.10E-05	0.00E+00	6.63E-02
Phosphorus	2.70E-05	0.00E+00	3.51E-02
Propionaldehyde	6.10E-05	0.00E+00	7.93E-02
Pyrene	3.70E-06	4.61E-08	4.82E-03
Selenium	2.80E-06	3.16E-06	4.36E-03
Silver	1.70E-03	0.00E+00	2.21E+00
Styrene	1.90E-03	0.00E+00	2.47E+00
Tetrachloroethylene	3.80E-05	0.00E+00	4.94E-02
Tin	2.30E-05	0.00E+00	2.99E-02
Toluene	9.20E-04	0.00E+00	1.20E+00
Trichloroethene	3.00E-05	0.00E+00	3.90E-02
Vanadium	9.80E-07	0.00E+00	1.27E-03
Vinyl acetate	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	1.80E-05	0.00E+00	2.34E-02
Xylenes	2.50E-05	0.00E+00	3.25E-02
Yttrium	3.00E-07	0.00E+00	3.90E-04
Zinc	4.20E-04	3.53E-04	6.27E-01

Notes:

[1] AP-42 Chapter 1.6 - Table 1.6-3 & 1.6-4

[2] California Air Toxics Emission Factors Search Result. *Coke in Fluidized Bed Combustor.* http://www.arb.ca.gov/app/emsinv/catef_list.php

[3] Technical Memorandum dated November 1, 2005 from David Dixon to the Maine Air Toxics Initiative Emissions Inventory Subcommittee references a NCASI acrolein emission factor of 7.8 E-05 lb/MMBtu for wood-fired boilers.

[4] Lead and Mercury emission rates are based on BACT determination.

HAPs/Toxics Emissions
85% Biomass, 15% TDF Feedstock

BFB Boiler	
Operating Scenario	85% Biomass, 15% TDF
Heat Input (MMBtu/hr)	1,529

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)		Emission Rate (lb/hr)
	Biomass[1]	TDF[2]	
1,1,1-Trichloroethane	3.10E-05	0.00E+00	4.03E-02
1,2-Dichloroethane	2.90E-05	0.00E+00	3.77E-02
1,2-Dichloropropane	3.30E-05	0.00E+00	4.29E-02
2,3,7,8-Tetrachlorodibenzo-p-dioxins	8.60E-12	0.00E+00	1.12E-08
2,3,7,8-Tetrachlorodibenzo-p-furans	9.00E-11	0.00E+00	1.17E-07
2,4,6-Trichlorophenol	2.20E-08	0.00E+00	2.86E-05
2,4-Dinitrophenol	1.80E-07	0.00E+00	2.34E-04
2,4-Dinitrotoluene	0.00E+00	0.00E+00	0.00E+00
2-Chloroacetophenone	0.00E+00	0.00E+00	0.00E+00
4-Nitrophenol	1.10E-07	0.00E+00	1.43E-04
5-Methyl chrysene	0.00E+00	0.00E+00	0.00E+00
Acenaphthene	9.10E-07	5.60E-09	1.18E-03
Acenaphthylene	5.00E-06	0.00E+00	6.50E-03
Acetaldehyde	8.30E-04	0.00E+00	1.08E+00
Acetone	1.90E-04	0.00E+00	2.47E-01
Acetophenone	3.20E-09	0.00E+00	4.16E-06
Acrolein[3]	7.80E-05	0.00E+00	1.01E-01
Aluminum	0.00E+00	2.30E-05	5.28E-03
Ammonia	0.00E+00	0.00E+00	0.00E+00
Anthracene	3.00E-06	1.10E-08	3.90E-03
Antimony	7.90E-06	0.00E+00	1.03E-02
Arsenic	2.20E-05	0.00E+00	2.86E-02
Barium	1.70E-04	0.00E+00	2.21E-01
Benzene	4.20E-03	0.00E+00	5.46E+00
Benzo(a)anthracene	6.50E-08	0.00E+00	8.45E-05
Benzo(a)pyrene	2.60E-06	0.00E+00	3.38E-03
Benzo(b)fluoranthene	1.00E-07	5.60E-09	1.31E-04
Benzo(b,j,k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	9.30E-08	0.00E+00	1.21E-04
Benzo(j,k)fluoranthene	1.60E-07	0.00E+00	2.08E-04
Benzo(k)fluoranthene	3.60E-08	0.00E+00	4.68E-05
Benzyl chloride	0.00E+00	0.00E+00	0.00E+00
Beryllium	1.10E-06	0.00E+00	1.43E-03
Biphenyl	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	4.70E-08	0.00E+00	6.11E-05
Bromoform	0.00E+00	0.00E+00	0.00E+00
Cadmium	4.10E-06	3.70E-06	6.18E-03
Carbon disulfide	0.00E+00	0.00E+00	0.00E+00
Carbon tetrachloride	4.50E-05	0.00E+00	5.85E-02
Chlorine	7.90E-04	0.00E+00	1.03E+00
Chlorobenzene	3.30E-05	0.00E+00	4.29E-02
Chloroform	2.80E-05	0.00E+00	3.64E-02
Chromium	2.10E-05	4.70E-06	5.63E-03
Chromium (Hex)	3.50E-06	0.00E+00	2.73E-02
Chrysene	3.80E-08	0.00E+00	4.94E-05
Cobalt	6.50E-06	0.00E+00	8.45E-03
Copper	4.90E-05	7.50E-06	6.54E-02
Crotonaldehyde	9.90E-06	0.00E+00	1.29E-02
Cumene	0.00E+00	0.00E+00	0.00E+00
Cyanide	0.00E+00	0.00E+00	0.00E+00
Dimethyl sulfate	0.00E+00	0.00E+00	0.00E+00
Ethyl chloride	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	3.10E-05	0.00E+00	4.03E-02

HAPs/Toxics Emissions
85% Biomass, 15% TDF Feedstock

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)		Emission Rate (lb/hr)
	Biomass[1]	TDF[2]	
Ethylene dibromide	0.00E+00	0.00E+00	0.00E+00
Ethylene dichloride	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	1.60E-06	1.70E-08	2.08E-03
Fluorene	3.40E-06	1.70E-08	4.42E-03
Formaldehyde	4.40E-03	1.70E-04	5.76E+00
Hexane	0.00E+00	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00	0.00E+00
Hydrogen chloride	1.90E-02	0.00E+00	2.47E+01
Indeno(1,2,3,c,d)pyrene	8.70E-08	0.00E+00	1.13E-04
Iron	9.90E-04	7.30E-05	1.30E+00
Isophorone	0.00E+00	0.00E+00	0.00E+00
Lead[4]			2.75E-02
Manganese	1.60E-03	1.60E-06	2.08E+00
Mercury[4]			4.71E-04
Methane	2.10E-02	0.00E+00	2.73E+01
Methyl bromide	1.50E-05	0.00E+00	1.95E-02
Methyl chloride	2.30E-05	0.00E+00	2.99E-02
Methyl ethyl ketone	5.40E-06	0.00E+00	7.02E-03
Methyl hydrazine	0.00E+00	0.00E+00	0.00E+00
Methyl methacrylate	0.00E+00	0.00E+00	0.00E+00
Methyl tert butyl ether	0.00E+00	0.00E+00	0.00E+00
Methylene chloride	0.00E+00	0.00E+00	0.00E+00
Molybdenum	2.10E-06	0.00E+00	2.73E-03
Naphthalene	9.70E-05	1.20E-06	1.26E-01
Nickel	3.30E-05	6.30E-06	4.43E-02
PAH	0.00E+00	0.00E+00	0.00E+00
PCB	0.00E+00	0.00E+00	0.00E+00
Pentachlorophenol	5.10E-08	0.00E+00	6.63E-05
Phenanthrene	7.00E-06	5.60E-09	9.10E-03
Phenol	5.10E-05	0.00E+00	6.63E-02
Phosphorus	2.70E-05	0.00E+00	3.51E-02
Propionaldehyde	6.10E-05	0.00E+00	7.93E-02
Pyrene	3.70E-06	2.20E-08	4.81E-03
Selenium	2.80E-06	0.00E+00	3.64E-03
Silver	1.70E-03	0.00E+00	2.21E+00
Styrene	1.90E-03	0.00E+00	2.47E+00
Tetrachloroethylene	3.80E-05	0.00E+00	4.94E-02
Tin	2.30E-05	4.20E-06	3.09E-02
Toluene	9.20E-04	0.00E+00	1.20E+00
Trichloroethene	3.00E-05	0.00E+00	3.90E-02
Vanadium	9.80E-07	0.00E+00	1.27E-03
Vinyl acetate	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	1.80E-05	0.00E+00	2.34E-02
Xylenes	2.50E-05	0.00E+00	3.25E-02
Yttrium	3.00E-07	0.00E+00	3.90E-04
Zinc	4.20E-04	1.40E-04	5.78E-01

Notes:

[1] AP-42 Chapter 1.6 - Table 1.6-3 & 1.6-4

[2] U.S. EPA Office of Research and Development, *Air Emissions from Scrap Tire Combustion* . EPA-600/R-97-115. October 1997. Table A-1b

[3] Technical Memorandum dated November 1, 2005 from David Dixon to the Maine Air Toxics Initiative Emissions Inventory Subcommittee references a NCASI acrolein emission factor of 7.8 E-05 lb/MMBtu for wood-fired boilers.

[4] Lead and Mercury emission rates are based on BACT determination.

Auxiliary Boiler HAPs/Toxics Emissions

Aux. Boiler	
Operating Scenario	100% Fuel Oil #2
Heat Input (MMBtu/hr)	25

HAPs/Toxics Pollutant	Emission Factors (lb/MMBtu)	Emission Rate (lb/hr)
	Fuel Oil #2[1]	
1,1,1-Trichloroethane	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00
1,2-Dichloropropane	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxins	0.00E+00	0.00E+00
2,3,7,8-Tetrachlorodibenzo-p-furans	0.00E+00	0.00E+00
2,4,6-Trichlorophenol	0.00E+00	0.00E+00
2,4-Dinitrophenol	0.00E+00	0.00E+00
2,4-Dinitrotoluene	0.00E+00	0.00E+00
2-Chloroacetophenone	0.00E+00	0.00E+00
4-Nitrophenol	0.00E+00	0.00E+00
5-Methyl chrysene	0.00E+00	0.00E+00
Acenaphthene	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00
Acetaldehyde	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00
Acetophenone	0.00E+00	0.00E+00
Acrolein	0.00E+00	0.00E+00
Aluminum	0.00E+00	0.00E+00
Ammonia	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00
Arsenic	4.00E-06	1.00E-04
Barium	0.00E+00	0.00E+00
Benzene	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00
Benzo(b,j,k)fluoranthene	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	0.00E+00
Benzo(j,k)fluoranthene	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00
Benzyl chloride	0.00E+00	0.00E+00
Beryllium	3.00E-06	7.50E-05
Biphenyl	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	0.00E+00	0.00E+00
Bromoform	0.00E+00	0.00E+00
Cadmium	3.00E-06	7.50E-05
Carbon disulfide	0.00E+00	0.00E+00
Carbon tetrachloride	0.00E+00	0.00E+00
Chlorine	0.00E+00	0.00E+00
Chlorobenzene	0.00E+00	0.00E+00
Chloroform	0.00E+00	0.00E+00
Chromium	3.00E-06	7.50E-05
Chromium (Hex)	0.00E+00	0.00E+00
Chrysene	0.00E+00	0.00E+00
Cobalt	0.00E+00	0.00E+00
Copper	6.00E-06	1.50E-04
Crotonaldehyde	0.00E+00	0.00E+00

Auxiliary Boiler HAPs/Toxics Emissions

Cumene	0.00E+00	0.00E+00
Cyanide	0.00E+00	0.00E+00
Dimethyl sulfate	0.00E+00	0.00E+00
Ethyl chloride	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00
Ethylene dibromide	0.00E+00	0.00E+00
Ethylene dichloride	0.00E+00	0.00E+00
Fluoranthene	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00
Formaldehyde	0.00E+00	0.00E+00
Hexane	0.00E+00	0.00E+00
HF	0.00E+00	0.00E+00
Hydrogen chloride	0.00E+00	0.00E+00
Indeno(1,2,3,c,d)pyrene	0.00E+00	0.00E+00
Iron	0.00E+00	0.00E+00
Isophorone	0.00E+00	0.00E+00
Lead	9.00E-06	2.25E-04
Manganese	6.00E-06	1.50E-04
Mercury	3.00E-06	7.50E-05
Methane	0.00E+00	0.00E+00
Methyl bromide	0.00E+00	0.00E+00
Methyl chloride	0.00E+00	0.00E+00
Methyl ethyl ketone	0.00E+00	0.00E+00
Methyl hydrazine	0.00E+00	0.00E+00
Methyl methacrylate	0.00E+00	0.00E+00
Methyl tert butyl ether	0.00E+00	0.00E+00
Methylene chloride	0.00E+00	0.00E+00
Molybdenum	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00
Nickel	3.00E-06	7.50E-05
PAH	0.00E+00	0.00E+00
PCB	0.00E+00	0.00E+00
Pentachlorophenol	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00
Phosphorus	0.00E+00	0.00E+00
Propionaldehyde	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00
Selenium	1.50E-05	3.75E-04
Silver	0.00E+00	0.00E+00
Styrene	0.00E+00	0.00E+00
Tetrachloroethylene	0.00E+00	0.00E+00
Tin	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00
Trichloroethene	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00
Vinyl acetate	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00
Yttrium	0.00E+00	0.00E+00
Zinc	4.00E-06	1.00E-04
	Total	**1.48E-03**

Notes:

[1] AP-42 Chapter 1.3 - Table 1.3-10