DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Knife River, Inc.
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
HMA Dryer Baghouse	DRYBH	0.64	0.37	1.62	0.94	1.54	0.89	3.64	2.11	0.90	0.52	0.00	0.00
HMA Tank Heater	HEATER	0.27	0.16	1.19	0.69	0.36	0.21	0.17	0.10	0.02	0.01	0.00	0.00
HMA Generator 1	GEN1	0.20	0.23	0.18	0.21	2.78	3.23	0.60	0.69	0.22	0.26		
HMA Generator 2	GEN2	0.38	0.22	1.91	1.11	12.10	7.02	3.21	1.87	0.34	0.20		
(insert more rows as needed)													
Total		1.49	0.98	4.90	2.95	16.78	11.35	7.62	4.77	1.48	0.99	0.00	0.00

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Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													

Instructions for Form EI-CP1

This form is designed to provide the permit writer and air quality modeler with a summary of the criteria pollutant emissions of each emission unit/point located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of all emission units at the facility. This name must match names on other submittals to IDEQ and within this application.

2. Provide the identification number for the stack which the emission unit exits.

3. Provide the emission rate in pounds per hour and tons per year for all criteria pollutants emitted by this point source. In this form, emission rates for a point source are the maximum allowable emissions for both short term (pounds per hour) and long term (tons per year). These emission rates are its permitted limits (if any). Otherwise, potential to emit should be shown. Potential to emit is defined as uncontrolled emissions at maximum design or achievable capacity (whichever is higher) and year-round continuous operation (8760 hours per year) if there are no federally enforceable permit limits on the emission point. If the emission point has or will have control equipment or some other proposed permit limitation such as hours of operation or material usage, the control efficiency or proposed permit limit(s) may be used in calculating potential to emit.

NOTE: Attach a separate sheet of paper, or electronic file, to provide additional documentation on the development of the emission rates. Documentation can include emissions factors, throughput, and example calculations.

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Company Name:	Knife River, Inc
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	Fugitive ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Fugitive Source(s)													
Silo and Truck loading	SILO	0.31	0.18					0.71	0.41	4.51	2.62		
Fuel Storage Tank 1	FST1									0.00	0.00		
Fuel Storage Tank 2	FST2									0.00	0.00		
Asphalt Storage Tank 3	AST3									0.00	0.00		
Material handling/bin loading	BIN1	1.46	0.85										
HMA conveyors	CONVEY	0.28	0.17										
(insert more rows as needed)													
Total		2.05	1.20					0.71	0.41	4.51	2.62		

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Company Name:	Knife River, Inc
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	Fugitive ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Fugitive Source(s)													

Instructions for Form EI-CP2

This form is designed to provide the permit writer and air quality modeler with a summary of the criteria pollutant emissions of each emission unit/point located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on form CS in the boxes provided. This is useful in case any pages of the application get separated.

Fugitive emissions are those emissions that cannot reasonably be made to pass through a stack or vent or equivalent opening. Examples include coal piles, unpaved roads, etc. Fugitive emission sources at your plant must be included in this form.

1. Provide the name of all fugitive sources at the facility. This name must match names on other submittals to IDEQ and within this application.

2. Provide the identification number for the fugitive source. This ID number should match ID numbers on other submittals to IDEQ and within this application.

3. Provide the emission rate in pounds per hour and tons per year for all criteria pollutants emitted by this fugitive source. In this form, emission rates for a fugitive source are the maximum allowable emissions for both short term (pounds per hour) and long term (tons per year). These emission rates are its permitted limits (if any). Otherwise, potential to emit should be shown. Potential to emit is defined as uncontrolled emissions at maximum design or achievable capacity (whichever is higher) and year-round continuous operation (8760 hours per year) if there are no federally enforceable permit limits on the emission point. If the emission point has or will have control equipment or some other proposed permit limitation such as hours of operation or material usage, then, the control efficiency or proposed permit limit(s) may be used in calculating potential to emit.

NOTE: Attach a separate sheet of paper, or electronic file, to provide additional documentation on the development of the emission rates. Documentation can include emissions factors, throughput, and example calculations.

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Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	
Facility Name:	
Facility ID No.:	
Brief Project Description:	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
name of the emissions unit1													
name of the emissions unit2													
name of the emissions unit3													
name of the emissions unit4													
name of the emissions unit5													
name of the emissions unit6													
name of the emissions unit7													
name of the emissions unit8													
name of the emissions unit9													
name of the emissions unit10													
name of the emissions unit11													
name of the emissions unit12													
name of the emissions unit13													
name of the emissions unit14													
name of the emissions unit15													
name of the emissions unit16													
name of the emissions unit17													
name of the emissions unit18													
name of the emissions unit19													
name of the emissions unit20													
name of the emissions unit21													
(insert more rows as needed)													
Total													

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	
Facility Name:	
Facility ID No.:	
Brief Project Description:	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													

Instructions for Form EI-CP3

This form is designed to provide the permit writer and air quality modeler with a summary of the change in criteria pollutant emissions of each emission unit/point associated with this permit application. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of the emission unit. This name should match names on other submittals to IDEQ and within this application.

2. Provide the identification number for the stack which the emission unit exits.

3. Provide the increase in emissions in pounds per hour and tons per year for all criteria pollutants emitted by this emission unit. In this form, increase in emissions for an emission unit are the proposed PTE - Previously modeled PTE. If the emission point has or will have control equipment or some other proposed permit limitation such as hours of operation or material usage, then, the control efficiency or proposed permit limit(s) may be used in calculating proposed potential to emit.

NOTE: Attach a separate sheet of paper, or electronic file, to provide additional documentation on the development of the emission rates. Documentation can include emissions factors, throughput, and example calculations.

DEQ AIR QUALITY PROGRAM
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Please see instructions on page 2 before filling out the form.

Company Name:	
Facility Name:	
Facility ID No.:	
Brief Project Description:	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - FUGITIVE SOURCES

1.	2.	3. Air Pollutant Maximum Change in Emissions Rate (lbs/hr or t/yr)											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Fugitive Source(s)													
name of fugitive source1													
name of fugitive source2													
name of fugitive source3													
name of fugitive source4													
name of fugitive source5													
name of fugitive source6													
name of fugitive source7													
name of fugitive source8													
name of fugitive source9													
name of fugitive source10													
name of fugitive source11													
name of fugitive source12													
name of fugitive source13													
name of fugitive source14													
name of fugitive source15													
name of fugitive source16													
name of fugitive source17													
name of fugitive source18													
name of fugitive source19													
name of fugitive source20													
name of fugitive source21													
(insert more rows as needed)													
Total													

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Company Name:	
Facility Name:	
Facility ID No.:	
Brief Project Description:	

SUMMARY OF EMISSIONS INCREASE (PROPOSED PTE - PREVIOUSLY MODELED PTE) - FUGITIVE SOURCES

1.	2.	3. Air Pollutant Maximum Change in Emissions Rate (lbs/hr or t/yr)											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Fugitive Source(s)													

Instructions for Form EI-CP4

This form is designed to provide the permit writer and air quality modeler with a summary of the change in criteria pollutant emissions of each emission unit/point associated with this permit application. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID Number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of the emission unit. This name should match names on other submittals to IDEQ and within this application.

2. Provide the identification number for the fugitive source. This ID should match IDs on other submittals to IDEQ and within this application.

3. Provide the increase in emissions in pounds per hour and tons per year for all criteria pollutants emitted by this fugitive source. In this form, increase in emissions for an emission unit are the proposed PTE - Previously modeled PTE. If the fugitive source has or will have control equipment or some other proposed permit limitation such as hours of operation or material usage, the control efficiency or proposed permit limit(s) may be used in calculating proposed potential to emit.

NOTE: Attach a separate sheet of paper, or electronic file, to provide additional documentation on the development of the emission rates. Documentation can include emissions factors, throughput, and example calculations.

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PERMIT TO CONSTRUCT APPLICATION
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4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Knife River, Inc
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (g/m3)**	**Significant Contribution Level (g/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour	150.00	5	54.37	73.00	127.00	150	85%
	Annual	50.00	1	3.01	26.00	29.00	50	58%
SO_2	3-hr	1,300.00	25	88.37	34.00	122.00	1300	9%
	24-hr	365.00	5	26.74	26.00	53.00	365	15%
	Annual	80.00	1	1.55	8.00	10.00	80	13%
NO_2	Annual	100.00	1	9.15	17.00	26.00	100	26%
CO	1-hr	40,000.00	2000	162.01	3,600.00	3,762.00	10000	38%
	8-hr	10,000.00	500	112.81	2,300.00	2,413.00	40000	6%

Instructions for Form MI1

This form is designed to provide the air quality modeler with a summary of the air impact analysis results for the criteria pollutants. This information will be used by IDEQ to determine compliance demonstration with the national ambient air quality standards (NAAQS).

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

Significant Impact Analysis - Evaluates the emissions increase from the proposed project only. This analysis determines whether or not a proposed project has a significant impact on ambient air, and therefore, requires a full impact analysis.

Full Impact Analysis - Only required if the significant impact analysis exceeds the significant contribution level - evaluates the emissions from the facility, including the emissions increase from the proposed project. This analysis determines whether the facility, with the emissions increase, complies with the NAAQS.

1. Provide the results of the significant impact analysis in $\mu g/m^3$.
2. Provide the results of the full impact analysis in $\mu g/m^3$ (if required).
3. List the background concentration in mg/m3. Contact the Stationary Source Modeling Coordinator at (208) 373-0502 for the current background concentrations for the area of interest. (Not needed if full impact analysis is not required.)
4. Provide the total ambient impact in mg/m3. The total ambient impact is the sum of the background concentration and the full impact analysis result.
5. Calculate the percent of the NAAQS that the total ambient impact analysis represents.

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Knife River, Inc.
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
HMA Dryer Baghouse	DRYBH	556,917.55	4,979,861.98	1,176.00	8.00	1.05	414.00	34,549.00	18.83	vertical, no raincap
HMA Tank Heater	HEATER	556,928.00	4,979,851.50	1,179.00	3.70	0.15	414.00	5,028.00	134.30	vertical, no raincap
HMA Generator 1	GEN1	556,945.50	4,979,860.50	1,176.00	2.10	0.10	616.00	582.50	35.00	vertical, no raincap
HMA Generator 2	GEN2	556,946.00	4,979,857.71	1,176.00	2.30	0.15	616.00	2,246.40	60.00	vertical, no raincap

Instructions for Form MI2

This form is designed to provide the air quality modeler with information on the stack characteristics of each point source located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of the emission unit. This name should match names on other submittals to IDEQ and within this application.
2. Provide the identification number for the stack which the emission unit exits.
3. Provide the UTM locations for each point source. The UTM Easting and UTM Northing are the coordinates for the center of the point source.
4. Provide the elevation of the base of the stack. This elevation must be calculated by the same method as the buildings and receptor elevation.
5. Provide the height of the stack, from the ground.
6. Provide the stack diameter that is included in the modeling analysis. Refer to the State of Idaho Modeling Guideline for guidance on developing the appropriate diameter.
7. Provide the stack exit temperature. Include documentation and justification for the exit temperature used.
8. Provide the stack exit flowrate. Include documentation and justification for the exit flowrate used.
9. Provide the stack exit velocity. Include documentation and justification for the exit velocity used.
10. Provide the orientation of the stack (horizontal or vertical). Indicate whether there is an obstruction on the stack, such as a raincap.

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Company Name:	Knife River, Inc.
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Release Height (m)**	**Easterly Length (m)**	**Northerly Length (m)**	**Angle from North (°)**	**Initial Vertical Dimension (m)**	**Initial Horizontal Dimension (m)**
Area Source(s)										
Fuel Storage Tank 1	FST1	556,950.00	4,979,852.80	1,176.00	3.00	0.10				
Fuel Storage Tank 2	FST2	556,948.00	4,979,850.30	1,176.00	3.50	0.10				
Asphalt Storage Tank 3	AST3	556,939.00	4,979,851.30	1,176.00	4.25	0.15				
Volume Source(s)										
Aggregate Bin Loading	AGGBIN	556,942.93	4,979,827.00	1,176.00	2.00				1.65	0.28
Aggregate Truck Unloading	AGUNLOAD	556,959.70	4,979,834.01	1,176.00	2.00				0.93	1.13
Conveyor 1	CONVEY1	556,942.93	4,979,840.00	1,176.00	2.00				0.94	0.28
Conveyor 2	CONVEY2	556,924.03	4,979,842.00	1,176.00	2.00				0.61	0.28
Conveyor 3	CONVEY3	556,918.50	4,979,845.75	1,176.00	2.00				0.50	0.28
Silo and Truck Loading	SILO	556,905.00	4,979,837.10	1,176.00	9.10				0.43	0.85
Rap Bin Loading	RAPBIN	556,923.70	4,979,838.50	1,176.00	2.00				0.71	0.28
Rap Truck Unloading	RAPUNLOAD	556,924.00	4,979,826.00	1,176.00	2.00				0.93	1.13

Instructions for Form MI3

This form is designed to provide the air quality modeler with information on the characteristics of each fugitive source located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

Fugitive sources are typically modeled as either area or volume sources. Area sources are used to model fugitives from sources such as roads or parking lots, while volume sources are typically used to model fugitives from piles. Refer to the State of Idaho Air Quality Modeling Guideline for additional guidance on modeling fugitive sources.

1. Provide the name of the fugitive source. This name should match names used on other submittals to IDEQ and within this application.
2. Provide the identification number for the fugitive source.
3. Provide the UTM locations of the fugitive source. The UTM Easting and UTM Northing are the coordinates for the center of the fugitive source.
4. Provide the elevation of the base of the fugitive source. This elevation must be calculated by the same method as the buildings and receptor elevation.
5. Provide the height of the fugitive source, from the ground. This is used for an elevated release. If the fugitive source is at ground level enter zero.
6. Provide the easterly length of the fugitive source.
7. Provide the northly length of the fugitive source.
8. Provide the angle from north, in degrees. This allows for accurate evaluation of the alignment of the fugitive source.
9. Provide the initial vertical dimension of the fugitive source. Refer to the State of Idaho Modeling Guideline for guidance on estimating this value.
10. Provide the initial horizontal dimension of the fugitive source. This parameter is only used for volume sources. Refer to the State of Idaho Modeling Guideline for guidance on estimating this value.

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Company Name:	Knife River, Inc.
Facility Name:	Knife River Caldwell
Facility ID No.:	
Brief Project Description:	Place a portable hot mix asphalt plant in Caldwell, Idaho

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Office	10.00	10.00	1176.00	10.00	1	Control Office
HMA Plant	150.00	90.00	1176.00	29.20	1	Silo, conveyors, dryer, screen , and hoppers
GEN1a	9.80	3.28	1176.00	6.00	1	Generator
GEN2a	11.50	5.90	1176.00	7.00	1	Generator
AST3a	35.00	13.00	1176.00	13.08	1	Asphalt Storage Tank
FST1a	8.20	5.90	1176.00	8.00	1	Fuel storage tank
FST2a	19.02	5.40	1176.00	10.50	1	Fuel storage tank
DRYBH	49.20	15.00	1176.00	7.00	1	Dryer Baghouse
AGG	29.00	26.00	1176.00	12.00	4	Aggregate pile 1
AGG2	29.00	26.00	1176.00	12.00	4	Aggregate pile 2
RAP	26.00	26.00	1176.00	9.00	3	RAP Pile

This form is designed to provide the air quality modeler with information on the buildings and structures located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the building ID number.
2. Provide the length of the building.
3. Provide the width of the building.
4. Provide the base elevation of the building. This elevation must be calculated by the same method as the sources and receptor elevation.
5. Provide the height of the building, from the ground.
6. Provide the number of tiers on the building. Refer to the State of Idaho Modeling Guideline for guidance on this topic.
7. Provide a description of the building.

Appendix C

Emission Estimates

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
HMA Criteria Pollutant Emission Summary

Source	Emission Rate (ton/year)							
	PM	PM-10	NO_x	SO_2	CO	VOC	HCl	Lead
Point Source								
HMA Dryer	0.37	0.37	0.89	0.94	2.11	0.52	0.003	0.002
Tank Heater	0.45	0.45	0.21	0.69	0.10	0.01		5.85E-07
125 KW Generator	0.23	0.23	3.23	0.21	0.69	0.26		
750 KW Generator	0.22	0.22	6.92	1.09	1.84	0.19		
Fuel Storage Tank 1						0.001		
Fuel Storage Tank 2						0.001		
Asphalt Storage Tank 3						0.001		
Sum	1.27	1.27	11.25	2.94	4.74	0.99	0.00	2.44E-03
Modeling Threshold	na	1.0	1.0	1.0	na	na		0.6
Modeling Required		**Yes**	**Yes**	**Yes**				No
Fugitive Sources								
Silo and Truck Loading	0.18	0.18			0.41	2.62		
Storage Pile	0.62	0.62						
Material Handling/Bin Loading	0.85	0.85						
Conveyors	0.17	0.17						
Paved Roads	1.80	1.80						
Unpaved Roads	2.00	2.00						
Total	**6.9**	**6.9**	**11.3**	**2.9**	**5.2**	**3.6**	**0.0**	**0.0**

Source	Emission Rate (lb/hr)							
	PM	PM-10	NO_x	SO_2	CO	VOC	HCl	Lead
Point Source								
HMA Dryer	0.64	0.64	1.54	1.62	3.64	0.90	0.01	0.004
Tank Heater	0.78	0.78	0.36	1.19	0.17	0.02		1.01E-06
125 KW Generator	0.20	0.20	2.78	0.18	0.60	0.22		
750 KW Generator	0.37	0.37	11.92	1.88	3.17	0.34		
Fuel Storage Tank 1						0.0003		
Fuel Storage Tank 2						0.0001		
Asphalt Storage Tank 3						0.0003		
Sum	1.99	1.99	16.60	4.87	7.57	1.47	0.01	4.20E-03
Modeling Threshold	na	0.2	na	0.2	14.0	na	na	na
Modeling Required		**Yes**		**Yes**	**No**			
Fugitive Sources								
Silo and Truck Loading	0.31	0.31			0.71	4.51		
Storage Pile	0.73	0.73						
Material Handling/Bin Loading	1.46	1.46						
Conveyors	0.28	0.28						
Paved Roads	3.11	3.11						
Unpaved Roads	3.45	3.45						
Total	**11.3**	**11.3**	**16.6**	**4.9**	**8.3**	**6.0**	**0.0**	**0.0**

[a] *Defined as Process Fugitive Emissions, EPA AP-42, Chapter 11.1 Hot Mix Asphalt Plants, (December 2005)*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Summary of HAP Emissions

Hazardous Air Pollutants

Pollutant	CAS #	Dryer lb/hr	Tank Heater lb/hr	Load-out Silo lb/hr	Total lb/hr	IDAPA 58.01.01.585/586 - EL (lb/hr)	IDAPA 58.01.01.585/586 - (ug/m^3)	Compare to EL
Non PAH								
Acetaldehyde	75-07-0	3.64E-01			3.64E-01	3.00E-03	0.45	**Exceeds**
Acrolein	107-02-8	7.28E-03			7.28E-03	1.70E-02		Below
Benzene	71-43-2	1.09E-01	4.23E-06	1.70E-03	1.11E-01	8.00E-04	0.12	**Exceeds**
Bis(2-ethylhexyl)phthalate	117-81-7		3.25E-05		3.25E-05	2.80E-02		Below
Bromomethane	74-83-9			2.79E-04	2.79E-04	NA		Below
2-Butanone	78-93-3			1.90E-03	1.90E-03	3.93E+01		Below
Butylbenzylphthalate			7.54E-06		7.54E-06	NA		Below
Carbon Disulfide	75-15-0			6.97E-04	6.97E-04	2.00E+00		Below
Chloroethane	75-00-3			1.39E-04	1.39E-04	NA		Below
Chloromethane	74-87-3			9.59E-04	9.59E-04	NA		Below
Cumene	92-82-8			1.28E-03	1.28E-03	1.63E+01		Below
Dichlorobenzene			2.42E-06		2.42E-06	NA		
Dibutylphthalate	84-74-2		NA			3.33E-01		Below
Ethylbenzene	100-41-4	6.72E-02	9.61E-07	4.56E-03	7.18E-02	2.90E+01		Below
Formaldehyde	50-00-0	8.68E-01	4.99E-04		8.68E-01	5.10E-04	0.077	**Exceeds**
Hexane	110-54-3	2.58E-01	3.63E-03	5.16E-03	2.66E-01	1.20E+01		Below
Isooctane (2,2,4-trimethylpentane)	540-84-1	1.12E-02		3.15E-05	1.12E-02	NA		Below
Methyl Ethyl Ketone	78-93-3	5.60E-03			5.60E-03	3.93E+01		Below
Methyl chloroform	71-55-6	1.34E-02			1.34E-02	1.27E+02		Below
Methylene Chloride	75-09-2			9.21E-06	9.21E-06	1.60E-03	0.24	Below
Propionaldehyde	123-38-6	3.64E-02			3.64E-02	2.87E-02	21.5	**Exceeds**
Quinone	106-51-4	4.48E-02			4.48E-02	2.70E-02	20	**Exceeds**
Styrene	100-42-5			2.69E-04	2.69E-04	6.67E+00		Below
Tetrachloroethylene	127-18-4			8.97E-05	8.97E-05	1.30E-02	2.1	Below
Toluene	108-88-3	8.12E-01	9.37E-05	4.56E-03	8.17E-01	2.50E+01		Below
1,1,1-Trichloroethane			3.57E-06		3.57E-06	NA		Below
Trichloroethylene	79-01-6		NA			5.10E-04		Below
Trichlorofluoromethane	75-69-4			1.51E-05	1.51E-05	NA		Below
m-/p-Xylene	1330-20-7	5.60E-02		1.16E-02	6.76E-02	2.90E+01		Below
o-Xylene	95-47-6		1.65E-06	2.88E-03	2.88E-03	2.90E+01		Below
3-Methylchloranthrene	56-49-5		3.63E-09		3.63E-09	8.00E-04		Below
Naphthalene	91-20-3	1.82E-01	1.92E-04	2.49E-03	1.85E-01	3.33E+00	2500	Below
Pentane	109-66-0		5.24E-03		5.24E-03	1.18E+02		Below
Propane	74-98-6		3.22E-03		3.22E-03			
Benzo(a)pyrene	50-32-8	2.74E-06	5.92E-05	1.42E-05	7.61E-05	5.10E-04	0.0003	Below
PAH								
2-Methylnaphthalene	91-57-6	4.76E-02	4.83E-08	6.02E-03	5.36E-02			
Acenaphthene	83-32-9	3.92E-04	3.19E-07	5.82E-04	9.75E-04			
Acenaphthylene	208-96-8	6.16E-03	3.82E-09	3.67E-05	6.20E-03			
Anthracene	120-12-7	8.68E-04	1.63E-04	1.59E-04	1.19E-03			
Benzo(a)anthracene	56-55-3	5.88E-05	5.92E-05	5.79E-05	1.76E-04			
Benzo(a)pyrene	50-32-8	2.74E-06	5.92E-05	2.20E-06	6.41E-05			
Benzo(b)fluoranthene	205-99-2	2.80E-05	2.24E-08	7.26E-06	3.53E-05			
Benzo(e)pyrene	192-97-2	3.08E-05		1.42E-05	4.50E-05			
Benzo(g,h,i)perylene	191-24-2	1.12E-05	3.41E-08	1.81E-06	1.30E-05			
Benzo(k)fluoranthene	207-08-9	1.15E-05	2.24E-08	2.10E-06	1.36E-05			
Chrysene	218-01-9	5.04E-05	3.60E-08	2.48E-04	2.98E-04			
Dibenz(a,h)anthracene	53-70-3		2.52E-08	3.53E-07	3.78E-07			
Fluoranthene	206-44-0	1.71E-04	7.31E-08	1.54E-04	3.25E-04			
Fluorene	86-73-7	3.08E-03	6.75E-08	1.45E-03	4.53E-03			
Indeno(1,2,3-cd)pyrene	193-39-5	1.96E-06	3.23E-08	4.49E-07	2.44E-06			
Perylene	198-55-0	2.46E-06		4.23E-05	4.48E-05			
Phenanthrene	85-01-8	6.44E-03	1.59E-07	2.05E-03	8.49E-03			
Phenol	108-95-2		3.55E-05					
Pyrene	129-00-0	8.40E-04	1.05E-04	1.43E-04	1.09E-03			
OCDD			4.68E-11					
POM		1.53E-04	1.18E-04	3.18E-04	5.90E-04	2.00E-06	0.0003	**Exceeds**
Total		2.90E+00	1.34E-02	4.96E-02	2.59E+00		0.014	

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Summary of HAP Emissions

Metal Air Pollutants

Pollutant	CAS #	Dryer lb/hr	Tank Heater lb/hr	Load-out Silo lb/hr	Total lb/hr	IDAPA 58.01.01.585/586 - EL (lb/hr)	IDAPA 58.01.01.585/586 - (ug/m^3)	Compare to EL
Antimony	7440-36-0	5.04E-05			5.04E-05	3.30E-02		Below
Arsenic	7440-38-2	1.57E-04	1.63E-03		1.78E-03	1.50E-06	0.00023	**Exceeds**
Barium	7440-39-3	1.62E-03	8.86E-06		1.63E-03	3.30E-01		Below
Beryllium	440-41-7		4.53E-05		4.53E-05	2.80E-05	0.0042	**Exceeds**
Cadmium	7440-43-9	1.15E-04	1.38E-04		2.52E-04	3.70E-06	0.00056	**Exceeds**
Chromium	7440-47-3	1.54E-03	2.96E-04		1.84E-03	5.60E-07	0.000083	**Exceeds**
Cobalt	7440-48-4	7.28E-06	3.11E-06		1.04E-05	3.30E-03		Below
Copper	7440-50-8	8.68E-04	9.06E-05		9.59E-04	1.30E-02		Below
Hexavalent chromium	7440-47-3	1.26E-04			1.26E-04	5.60E-07	0.000083	**Exceeds**
Lead		4.20E-03	1.36E-04		4.34E-03	NA		Below
Manganese	7439-96-5	2.16E-03	1.01E-03		3.16E-03	6.70E-02		Below
Mercury	7439-97-6	7.28E-04	4.53E-05		7.73E-04	1.00E-03		Below
Molybdenum	7439-98-7		2.22E-06		2.22E-06	NA		Below
Nickel	7440-02-0	1.76E-02	1.63E-04		1.78E-02	2.70E-05	0.0042	**Exceeds**
Phosphorus	7723-14-0	7.84E-03			7.84E-03	7.00E-03	5	**Exceeds**
Silver	7440-22-4	1.34E-04			1.34E-04	7.00E-03		Below
Selenium	7782-49-2	9.80E-05	2.27E-04		3.25E-04	1.30E-02		Below
Thallium	7440-28-0	1.15E-06			1.15E-06	7.00E-03		Below
Vanadium	1314-62-1		4.63E-06		4.63E-06	NA		Below
Zinc	7440-66-6	1.71E-02	6.04E-05		1.71E-02	6.67E-01		Below
Total		5.44E-02	3.85E-03		5.82E-02			

Non-HAP Organic Compounds

Pollutant	CAS #	Dryer lb/hr	Tank Heater lb/hr	Load-out Silo lb/hr	Total lb/hr	IDAPA 58.01.01.585/586 - EL (lb/hr)		Compare to EL
Acetone	67-64-1	2.32E-01				1.19E+02		Below
Benzaldehyde	100-52-7	3.08E-02						
Butane	106-97-8	1.88E-01						
Butyraldehyde	78-84-2	4.48E-02						
Crotonaldehyde	4170-30-3	2.41E-02						
Ethylene	74-85-1	1.96E+00						
Heptane	142-82-5	2.63E+00				1.09E+02		Below
Hexanal	66-25-1	3.08E-02						
Isovaleraldehyde	590-86-3	8.96E-03						
2-Methyl-1-pentene	763-29-1	1.12E+00						
2-Methyl--2-butene	513-35-9	1.62E-01						
3-Methylpentane	96-14-0	5.32E-02						
1-Pentene	109-67-1	6.16E-01						
n-Pentane	109-66-0	5.88E-02				1.18E+02		Below
Valeraldehyde	110-62-3	1.88E-02				1.17E+01		Below
Total		7.18E+00			0.00E+00			

Dioxins

Pollutant	CAS #	Dryer lb/hr	Tank Heater lb/hr	Load-out Silo lb/hr	Total lb/hr	IDAPA 58.01.01.585/586 - EL (lb/hr)	IDAPA 58.01.01.585/586 - (ug/m^3)	Compare to EL
2,3,7,8-TCDD	1746-01-6	5.88E-11						
Total TCDD		2.60E-10			2.60E-10	1.50E-10	0.000000022	**Exceeds**
1,2,3,7,8-PeCDD	40321-76-4	8.68E-11						
Total PeCDD		6.16E-09						
1,2,3,4,7,8-HxCDD	39227-28-6	1.18E-10						
1,2,3,6,7,8-HxCDD	57653-85-7	3.64E-10						
1,2,3,7,8,9-HxCDD	19408-24-3	2.74E-10						
Total HxCDD		3.36E-09						
1,2,3,4,6,7,8-HpCDD	35822-46-9	1.34E-09						
Total HpCDD		5.32E-09						
Octa CDD	3268-87-9	7.00E-09						
Total PCDD		2.21E-08						
Total		4.65E-08			2.60E-10			

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Summary of HAP Emissions
Furans

Pollutant	CAS #	Dryer lb/hr	Tank Heater lb/hr	Load-out Silo lb/hr	Total lb/hr	IDAPA 58.01.01.585/586 - EL (lb/hr)		Compare to EL
2,3,7,8-TCDF	51207-31-9	2.72E-10						
Total TCDF		1.04E-09						
1.2.3.7.8-PeCDF		1.20E-09						
2,3,4,7,8-PeCDF		2.35E-10						
Total PCDF		2.35E-08						
1,2,3,4,7,8-HxCDF		1.12E-09						
1,2,3,6,7,8-HxCDF		3.36E-10						
2,3,4,6,7,8-HxCDF		5.32E-10						
1,2,3,7,8,9-HxCDF		2.35E-09						
Total HxCDF		3.64E-09						
1,2,3,4,6,7,8-HpCDF		1.82E-09						
1,2,3,4,7,8,9-HpCDF		7.56E-10						
Total HpCDF		2.80E-09						
Octa CDF	39001-02-0	1.34E-09						
Total PCDF		1.12E-08						
Total PCDD/PCDF		3.36E-08						
Total		8.30E-08			0.00E+00			

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Asphalt Storage Tank Heater Potential to Emit Calculations

Rated Capacity	280 ton/hr
	325000 ton/yr
No 2 Fuel Oil Sulfur content (%)	0.27
Ash Content in waste oil (%)	0.82
Lead Content in waste oil (%)	0

Assumptions	No 2 Fuel Oil (gal)	NG (scf)	Waste Oil (gal)[b]
Heat Input Rating (MM Btu/hr)	2.115	2.115	2.115
Heat Value (Btu/unit)[a]	140000	1050	143000
Theoretical Max Usage (unit/hr)	15	2,014	15
Potential Hours (hr/yr)	1,161	1,161	1,161

Criteria Pollutant Calculations [c]

Pollutant	EF - No 2 Fuel Oil ($lb/10^3$ gal)	EF - NG ($lb/10^6$ scf)	EF - Waste Oil ($lb/10^3$ gal)	PTE - No 2 Fuel		PTE - NG		PTE - Waste Oil		PTE - Worst Case	
				lb/hr	t/yr	lb/hr	t/yr	lb/hr	t/yr	lb/hr	t/yr
PM	2	7.6	52.48	0.03	0.02	0.02	0.01	0.78	0.45	0.78	0.45
SO_2	78.5	0.6	39.69	1.19	0.69	0.00	0.00	0.59	0.34	1.19	0.69
NOx	24	100	19	0.36	0.21	0.20	0.12	0.28	0.16	0.36	0.21
CO	5	84	5	0.08	0.04	0.17	0.10	0.07	0.04	0.17	0.10
VOC (as TOC)	0.556	11	1	0.01	0.00	0.02	0.01	0.01	0.01	0.02	0.01
Lead	NA	0.0005	NA	NA	NA	0.00	0.00	NA	NA	1.01E-06	5.85E-07

Idaho Toxic Air Pollutants

Organics[d]

Pollutant	CAS	EF No 2 Fuel Oil ($lb/10^3$ gal)	EF NG ($lb/10^6$ scf)	EF Wast Oil ($lb/10^3$ gal)	PTE No 2 Fuel Oil		PTE NG		PTE Waste Oil		PTE Worst Case		IDAPA 58.01.01.5	Comparison
					(lb/hr)	(t/yr)	(lb/hr)	(t/yr)	(lb/hr)	(t/yr)	(lb/hr)	(t/yr)	(lb/hr)	
Benzene	71-43-2	2.14E-04	2.10E-03	NA	3.23E-06	1.88E-06	4.23E-06	2.45E-06	NA	NA	4.23E-06	2.45E-06	8.00E-04	Below
Bis(2-ethylhexyl)phthalate	117-81-7	NA	NA	2.20E-03	NA	NA	NA	NA	3.25E-05	1.89E-05	3.25E-05	1.89E-05	2.80E-02	Below
Butane	106-97-8	NA	2.10E+00	NA	NA	NA	4.23E-03	2.45E-03	NA	NA	4.23E-03	2.45E-03		
Butylbenzylphthalate		NA	NA	5.10E-04	NA	NA	NA	NA	7.54E-06	4.38E-06	7.54E-06	4.38E-06		
Dichlorobenzene	25321-22-6	NA	1.20E-03	8.00E-07	NA	NA	2.42E-06	1.40E-06	1.18E-08	6.87E-09	2.42E-06	1.40E-06		
Dibutylphthalate	84-74-2	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	3.33E-01	NA
Ethane	74-84-0	NA	3.10E+00	NA	NA	NA	6.24E-03	3.62E-03	NA	NA	6.24E-03	3.62E-03		
Ethylbenzene	100-41-4	6.36E-05	NA	NA	9.61E-07	5.58E-07	NA	NA	NA	NA	9.61E-07	5.58E-07	2.90E+01	Below
Formaldehyde	50-00-0	3.30E-02	7.50E-02	NA	4.99E-04	2.89E-04	1.51E-04	8.77E-05	NA	NA	4.99E-04	2.89E-04	5.10E-04	Below
Hexane	110-54-3	NA	1.80E+00	NA	NA	NA	3.63E-03	2.10E-03	NA	NA	3.63E-03	2.10E-03	1.20E+01	Below
2-Methylnaphthalene	91-57-6	NA	2.40E-05	NA	NA	NA	4.83E-08	2.81E-08	NA	NA	4.83E-08	2.81E-08		
3-Methylchloranthrene	56-49-5	NA	1.80E-06	NA	NA	NA	3.63E-09	2.10E-09	NA	NA	3.63E-09	2.10E-09	2.50E-06	Below
Naphthalene	91-20-3	1.13E-03	6.10E-04	1.30E-02	1.71E-05	9.91E-06	1.23E-06	7.13E-07	1.92E-04	1.12E-04	1.92E-04	1.12E-04	3.33E+00	Below
Pentane	109-66-0	NA	2.60E+00	NA	NA	NA	5.24E-03	3.04E-03	NA	NA	5.24E-03	3.04E-03	1.18E+02	Below
Propane	74-98-6	NA	1.60E+00	NA	NA	NA	3.22E-03	1.87E-03	NA	NA	3.22E-03	1.87E-03		
1,1,1-Trichloroethane		2.36E-04	NA	NA	3.57E-06	2.07E-06	NA	NA	NA	NA	3.57E-06	2.07E-06		
Trichloroethylene	79-01-6	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	5.10E-04	NA
Toluene	108-88-3	6.20E-03	3.40E-03	NA	9.37E-05	5.44E-05	6.85E-06	3.97E-06	NA	NA	9.37E-05	5.44E-05	2.50E+01	Below
0-Xylene	1330-20-7	1.09E-04	NA	NA	1.65E-06	9.56E-07	NA	NA	NA	NA	1.65E-06	9.56E-07	2.90E+01	Below
7,12-Dimethylbenz(a)anthracene		NA	1.60E-05	NA	NA	NA	3.22E-08	1.87E-08	NA	NA	3.22E-08	1.87E-08		
Acenaphthene	83-32-9	2.11E-05	1.80E-06	NA	3.19E-07	1.85E-07	3.63E-09	2.10E-09	NA	NA	3.19E-07	1.85E-07		
Acenaphthylene	208-96-8	2.53E-07	1.80E-06	NA	3.82E-09	2.22E-09	3.63E-09	2.10E-09	NA	NA	3.82E-09	2.22E-09		
Phenanthrene/Anthracene	120-12-7	1.22E-06	2.40E-06	1.10E-02	1.84E-08	1.07E-08	4.83E-09	2.81E-09	1.63E-04	9.44E-05	1.63E-04	9.44E-05		
Benzo(a)pyrene	50-32-8	NA	1.20E-06	4.00E-03	NA	NA	2.42E-09	1.40E-09	5.92E-05	3.43E-05	5.92E-05	3.43E-05	2.00E-06	Exceeds
Benzo(a)anthracene	56-55-3	4.01E-06	1.80E-06	4.00E-03	6.06E-08	3.52E-08	3.63E-09	2.10E-09	5.92E-05	3.43E-05	5.92E-05	3.43E-05		
Benzo(b)fluoranthene	205-99-2	1.48E-08	1.80E-06	NA	2.24E-08	1.30E-08	3.63E-09	2.10E-09	NA	NA	2.24E-08	1.30E-08		
Benzo(k)fluoranthene	205-82-3	1.48E-06	1.80E-06		2.24E-08	1.30E-08	3.63E-09	2.10E-09	NA	NA	2.24E-08	1.30E-08		
Benzo(g,h,i)perylene	191-24-2	2.26E-06	1.20E-06	NA	3.41E-08	1.98E-08	2.42E-09	1.40E-09	NA	NA	3.41E-08	1.98E-08		
Chrysene	218-01-9	2.38E-06	1.80E-06	NA	3.60E-08	2.09E-08	3.63E-09	2.10E-09	NA	NA	3.60E-08	2.09E-08		
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	1.20E-06	NA	2.52E-08	1.46E-08	2.42E-09	1.40E-09	NA	NA	2.52E-08	1.46E-08		
Fluoranthene	206-44-0	4.84E-06	3.00E-06	NA	7.31E-08	4.24E-08	6.04E-09	3.51E-09	NA	NA	7.31E-08	4.24E-08		
Fluorine	86-73-7	4.47E-06	2.80E-06	NA	6.75E-08	3.92E-08	5.64E-09	3.27E-09	NA	NA	6.75E-08	3.92E-08	1.33E-01	Below
Indo(1,2,3-cd)pyrene	193-39-5	2.14E-06	1.80E-06	NA	3.23E-08	1.88E-08	3.63E-09	2.10E-09	NA	NA	3.23E-08	1.88E-08		
Phenanthrene	85-01-8	1.05E-05	1.70E-05	NA	1.59E-07	9.21E-08	3.42E-08	1.99E-08	NA	NA	1.59E-07	9.21E-08		
Phenol	108-95-2	NA	NA	2.40E-03	NA	NA	NA	NA	3.55E-05	2.06E-05	3.55E-05	2.06E-05	1.27E+00	Below
Pyrene	129-00-0	4.25E-06	5.00E-06	7.10E-03	6.42E-08	3.73E-08	1.01E-08	5.85E-09	1.05E-04	6.09E-05	1.05E-04	6.09E-05		
OCDD		3.10E-09	NA	NA	4.68E-11	2.72E-11	NA	NA	NA	NA	4.68E-11	2.72E-11		
Total IDAPA PAH					6.20E-04	3.60E-04	2.27E-02	1.32E-02	6.54E-04	3.79E-04	2.38E-02	1.38E-02		

Metals[e]

Pollutant	CAS No.	EF No 2 Fuel Oil ($lb/10^{12}$ Btu)	EF NG ($lb/10^6$ scf)	EF Wast Oil ($lb/10^3$ gal)	PTE No 2 Fuel Oil		PTE NG		PTE Waste Oil		PTE Worst Case		IDAPA 58.01.01.5	Comparison
					(lb/hr)	(t/yr)	(lb/hr)	(t/yr)	(lb/hr)	(t/yr)	(lb/hr)	(t/yr)	(lb/hr)	
Arsenic	7440-38-2	4.00E+00	2.00E-04	1.10E-01	6.04E-05	3.51E-05	4.03E-07	2.34E-07	1.63E-03	9.44E-04	1.63E-03	9.44E-04	1.50E-06	Exceeds
Antimony	7440-36-0	NA	NA	BDL	NA	NA	NA	NA	NA	NA	NA	NA	3.30E-02	NA
Barium	7440-39-3	NA	4.40E-03	NA	NA	NA	8.86E-06	5.14E-06	NA	NA	8.86E-06	5.14E-06	3.30E-02	NA
Beryllium	7440-41-7	3.00E+00	1.20E-05	BDL	4.53E-05	2.63E-05	2.42E-08	1.40E-08	NA	NA	4.53E-05	2.63E-05	2.80E-05	Exceeds
Cadmium	7440-43-9	3.00E+00	1.10E-03	9.30E-03	4.53E-05	2.63E-05	2.22E-06	1.29E-06	1.38E-04	7.98E-05	1.38E-04	7.98E-05	3.70E-06	Exceeds
Chromium	7440-47-3	3.00E+00	1.40E-03	2.00E-02	4.53E-05	2.63E-05	2.82E-06	1.64E-06	2.96E-04	1.72E-04	2.96E-04	1.72E-04	3.30E-02	Below
Cobalt	7440-48-4	NA	8.40E-05	2.10E-04	NA	NA	1.69E-07	9.82E-08	3.11E-06	1.80E-06	3.11E-06	1.80E-06	3.30E-03	Below
Copper	7440-50-8	6.00E+00	8.50E-04	NA	9.06E-05	5.26E-05	1.71E-06	9.94E-07	NA	NA	9.06E-05	5.26E-05	1.30E-02	Below
Lead		9.00E+00	NA	NA	1.36E-04	7.89E-05	NA	NA	NA	NA	1.36E-04	7.89E-05	NA	NA
Mercury	7439-97-6	3.00E+00	2.60E-04	NA	4.53E-05	2.63E-05	5.24E-07	3.04E-07	NA	NA	4.53E-05	2.63E-05	1.00E-03	Below
Manganese	7439-96-5	6.00E+00	3.80E-04	6.80E-02	9.06E-05	5.26E-05	7.65E-07	4.44E-07	1.01E-03	5.84E-04	1.01E-03	5.84E-04	3.33E-01	Below
Molybdenum	7439-98-7	NA	1.10E-03	NA	NA	NA	2.22E-06	1.29E-06	NA	NA	2.22E-06	1.29E-06	3.33E-01	NA
Nickel	7440-02-0	3.00E+00	2.10E-03	1.10E-02	4.53E-05	2.63E-05	4.23E-06	2.45E-06	1.63E-04	9.44E-05	1.63E-04	9.44E-05	2.75E-05	Exceeds
Selenium	7782-49-2	1.50E+01	2.40E-05	BDL	2.27E-04	1.32E-04	4.83E-08	2.81E-08	NA	NA	2.27E-04	1.32E-04	1.30E-02	Below
Vanadium	7440-62-2	NA	2.30E-03	NA	NA	NA	4.63E-06	2.69E-06	NA	NA	4.63E-06	2.69E-06	NA	NA
Zinc	7440-66-6	4.00E+00	2.90E-02	NA	6.04E-05	3.51E-05	5.84E-05	3.39E-05	NA	NA	6.04E-05	3.51E-05	3.33E-01	Below

Notes:

[a] *Fuel heat values from EPA AP-42, Appendix A (December 2005)*

[b] *Assumed Heat Input of waste oil to be same as No. 2 Fuel Oil and slighty higher heat value.*

[c] *Criteria Pollutants EPA AP-42, Section 1.3, Tables 1.3-1 and 1.3.3 Section 1.4 Tables 1.4-1, and 1.4-2 & Section 1.11, Tables 1.11-1, 1.11-2 and 1.11-3 (December 2005)*

[d] *Organic Toxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3 and 1.4-4 & Section 1.3, Table 1.3-9 (December 2005)*

[e] *Metals from EPA AP-42, Section 1.4, Table 1.4-4 & Section 1.3, Table 1.3-10 (December 2005)*

BDL = Below Detection Limit

ND = Non detect

NA = Non applicable

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Load-out, Silo and Asphalt Tank Potential to Emit Calculations

Assumptions:

Asphalt volatility, V[a]	-0.5
Mix Temperature[a]	325 °F
% VOC in load out TOC[b]	94 %
% VOC in Silo TOC[b]	100 %
Max hourly throughput	280 tons
Max yearly throughput	325,000 tons

Calculations[a]

Load-out Total PM EF = $0.000181+0.00141(-V)e^{((0.0251)(T+460)-20.43)}$
= 0.0005 lb / t

Silo Total PM EF = $0.000332+0.00105(-V)e^{((0.0251)(T+460)-20.43)}$
= 0.0006 lb / t

Load-out Total CO EF = $0.00558(-V)e^{((0.0251)(T+460)-20.43)}$
= 0.0013 lb / t

Silo Total CO EF = $0.00488(-V)e^{((0.0251)(T+460)-20.43)}$
= 0.0012 lb / t

Load-out Total TOC EF = $0.0172(-V)e^{((0.0251)(T+460)-20.43))}$
= 0.0042 lb / t

Silo Total TOC EF = $0.0504(-V)e^{((0.0251)(T+460)-20.43)}$
= 0.0122 lb / t

Load-out Organic PM EF[c] = $0.00141(-V)e^{((0.0251)(T+460)-20.43))}$
= 0.0003 lb / t

Silo Organic PM EF[c] = $0.00105(-V)e^{((0.0251)(T+460)-20.43)}$
= 0.0003 lb / t

Criteria Pollutants

Load-out and Yard Emissions	PM		CO		VOC	
	lb	ton	lb	ton	lb	ton
Max hourly	0.15	7.31E-05	0.38	1.89E-04	1.09	5.47E-04
Max yearly	169.63	0.08	438.50	0.22	1,270.56	0.64
Silo Filling and Storage	PM		CO		VOC	
	lb	ton	lb	ton	lb	ton
Max hourly	0.16	8.20E-05	0.33	1.65E-04	3.41	1.71E-03
Max yearly	190.41	0.10	383.49	0.19	3,960.67	1.98
Total hourly	**0.31**	**1.55E-04**	**0.71**	**3.54E-04**	**4.51**	**2.25E-03**
Total yearly	**360.04**	**0.18**	**822.00**	**0.41**	**5231.23**	**2.62**

[a] *EPA AP-42, Table 11.1-14, constants and equations, (December 2005)*
[b] *EPA AP-42, Table 11.1-16, (December, 2005)*
[c] *Used for HAP calculations on next page.*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Load-out,and Silo Filling Potential to Emit Calculations (HAP)

Hazardous Air Pollutants [a,b]

Pollutant	CAS #	Load-out speciation	Silo and Asphalt Storage Tank speciations	Load-out hourly lb	Load-out hourly ton	Load-out yearly lb	Load-out yearly ton	Silo And Asphalt Storage Tank hourly lb	Silo And Asphalt Storage Tank hourly ton	Silo and Asphalt Storage Tank Yearly lb	Silo and Asphalt Storage Tank Yearly ton	Total hourly lb	Total hourly ton	Total yearly lb	Total yearly ton	IDAPA 58.01.01.585/586 - EL (lb/hr)	Compare to EL
PAH HAPs																	
Acenaphthene	83-32-9	0.26%	0.47%	2.48E-04	1.24E-07	2.88E-01	1.44E-04	3.34E-04	1.67E-07	3.88E-01	1.94E-04	5.82E-04	2.91E-07	6.76E-01	3.38E-04		
Acenaphthylene	208-96-8	0.03%	0.01%	2.67E-05	1.34E-08	3.10E-02	1.55E-05	9.95E-06	4.98E-09	1.16E-02	5.78E-06	3.67E-05	1.83E-08	4.26E-02	2.13E-05		
Anthracene	120-1207	0.07%	0.13%	6.68E-05	3.34E-08	7.76E-02	3.88E-05	9.24E-05	4.62E-08	1.07E-01	5.36E-05	1.59E-04	7.96E-08	1.85E-01	9.24E-05		
Benzo(a)anthracene	56-55-3	0.02%	0.056%	1.81E-05	9.07E-09	2.11E-02	1.05E-05	3.98E-05	1.99E-08	4.62E-02	2.31E-05	5.79E-05	2.90E-08	6.73E-02	3.36E-05		
Benzo(b)fluoranthene	205-99-2	0.0076%	ND	7.26E-06	3.63E-09	8.42E-03	4.21E-06					7.26E-06	3.63E-09	8.42E-03	4.21E-06		
Benzo(k)fluoranthene	207-08-9	0.0022%	ND	2.10E-06	1.05E-09	2.44E-03	1.22E-06					2.10E-06	1.05E-09	2.44E-03	1.22E-06		
Benzo(g,h,i)perylene	191-24-2	0.0019%	ND	1.81E-06	9.07E-10	2.11E-03	1.05E-06					1.81E-06	9.07E-10	2.11E-03	1.05E-06		
Benzo(a)pyrene	50-32-8	0.0023%	ND	2.20E-06	1.10E-09	2.55E-03	1.27E-06					2.20E-06	1.10E-09	2.55E-03	1.27E-06		
Benzo(e)pyrene	192-97-2	0.0078%	0.0095%	7.45E-06	3.72E-09	8.64E-03	4.32E-06	6.75E-06	3.38E-09	7.84E-03	3.92E-06	1.42E-05	7.10E-09	1.65E-02	8.24E-06		
Chrysene	218-01-9	0.103%	0.21%	9.83E-05	4.92E-08	1.14E-01	5.71E-05	1.49E-04	7.46E-08	1.73E-01	8.66E-05	2.48E-04	1.24E-07	2.87E-01	1.44E-04		
Dibenz(a,h)anthracene	53-70-3	0.0004%	ND	3.53E-07	1.77E-10	4.10E-04	2.05E-07					3.53E-07	1.77E-10	4.10E-04	2.05E-07		
Fluoranthene	206-44-0	0.050%	0.15%	4.77E-05	2.39E-08	5.54E-02	2.77E-05	1.07E-04	5.33E-08	1.24E-01	6.19E-05	1.54E-04	7.72E-08	1.79E-01	8.96E-05		
Fluorene	86-73-7	0.77%	1.01%	7.35E-04	3.68E-07	8.53E-01	4.27E-04	7.18E-04	3.59E-07	8.33E-01	4.17E-04	1.45E-03	7.27E-07	1.69E+00	8.43E-04		
Indeno(1,2,3-cd)pyrene	193-39-5	0.00047%	ND	4.49E-07	2.24E-10	5.21E-04	2.60E-07					4.49E-07	2.24E-10	5.21E-04	2.60E-07		
2-Methylnaphthalene	91-57-6	2.38%	5.27%	2.27E-03	1.14E-06	2.64E+00	1.32E-03	3.75E-03	1.87E-06	4.35E+00	2.17E-03	6.02E-03	3.01E-06	6.99E+00	3.49E-03		
Naphthalene	91-20-3	1.25%	1.82%	1.19E-03	5.97E-07	1.39E+00	6.93E-04	1.29E-03	6.47E-07	1.50E+00	7.51E-04	2.49E-03	1.24E-06	2.89E+00	1.44E-03		
Perylene	198-55-0	0.02%	0.03%	2.10E-05	1.05E-08	2.44E-02	1.22E-05	2.13E-05	1.07E-08	2.48E-02	1.24E-05	4.23E-05	2.12E-08	4.91E-02	2.46E-05		
Phenanthrene	85-01-8	0.81%	1.80%	7.73E-04	3.87E-07	8.98E-01	4.49E-04	1.28E-03	6.40E-07	1.49E+00	7.43E-04	2.05E-03	1.03E-06	2.38E+00	1.19E-03		
Pyrene	129-00-0	0.15%	0.44%	1.43E-04	7.16E-08	1.66E-01	8.31E-05	3.13E-04	1.56E-07	3.63E-01	1.82E-04	4.56E-04	2.28E-07	5.29E-01	2.65E-04		
Total for Comparison [c]												3.32E-04	1.66E-07	1.60E+01	8.00E-03	9.10E-05	**Exceeds**
Other Semi-Volatile																	
Phenol		1.18%	ND	1.13E-03	5.63E-07	1.31E+00	6.54E-04					1.13E-03	5.63E-07	1.31E+00	6.54E-04		
Volatile Organic																	
Benzene	71-43-2	0.052%	0.032%	6.06E-04	3.03E-07	7.03E-01	3.51E-04	1.09E-03	5.46E-07	1.27E+00	6.34E-04	1.70E-03	8.49E-07	1.97E+00	9.85E-04	8.00E-04	**Exceeds**
Bromomethane	74-83-9	0.010%	0.0049%	1.12E-04	5.59E-08	1.30E-01	6.49E-05	1.67E-04	8.36E-08	1.94E-01	9.70E-05	2.79E-04	1.39E-07	3.24E-01	1.62E-04	NA	Below
2-Butanone	78-93-3	0.049%	0.039%	5.71E-04	2.85E-07	6.62E-01	3.31E-04	1.33E-03	6.65E-07	1.54E+00	7.72E-04	1.90E-03	9.51E-07	2.21E+00	1.10E-03	3.93E+01	Below
Carbon Disulfide	75-15-0	0.013%	0.0160%	1.51E-04	7.57E-08	1.76E-01	8.79E-05	5.46E-04	2.73E-07	6.34E-01	3.17E-04	6.97E-04	3.49E-07	8.09E-01	4.05E-04	2.00E+00	Below
Chloroethane	75-00-3	0.00021%	0.004%	2.45E-06	1.22E-09	2.84E-03	1.42E-06	1.36E-04	6.82E-08	1.58E-01	7.92E-05	1.39E-04	6.95E-08	1.61E-01	8.06E-05	NA	Below
Chloromethane	74-87-3	0.015%	0.023%	1.75E-04	8.73E-08	2.03E-01	1.01E-04	7.85E-04	3.92E-07	9.11E-01	4.55E-04	9.59E-04	4.80E-07	1.11E+00	5.57E-04	NA	Below
Cumene	92-82-8	0.110%	ND	1.28E-03	6.40E-07	1.49E+00	7.43E-04					1.28E-03	6.40E-07	1.49E+00	7.43E-04	1.63E+01	Below
Ethylbenzene	100-41-4	0.28%	0.04%	3.26E-03	1.63E-06	3.78E+00	1.89E-03	1.30E-03	6.48E-07	1.51E+00	7.53E-04	4.56E-03	2.28E-06	5.29E+00	2.64E-03	2.90E+01	Below
Formaldehyde	50-00-0	0.088%	0.69%	1.02E-03	5.12E-07	1.19E+00	5.95E-04	2.35E-02	1.18E-05	2.73E+01	1.37E-02	2.46E-02	1.23E-05	2.85E+01	1.43E-02	5.10E-04	**Exceeds**
n-Hexane	100-54-3	0.150%	0.10%	1.75E-03	8.73E-07	2.03E+00	1.01E-03	3.41E-03	1.71E-06	3.96E+00	1.98E-03	5.16E-03	2.58E-06	5.99E+00	2.99E-03	NA	Below
Isooctane	540-84-1	0.0018%	0.00%	2.10E-05	1.05E-08	2.43E-02	1.22E-05	1.06E-05	5.29E-09	1.23E-02	6.14E-06	3.15E-05	1.58E-08	3.66E-02	1.83E-05	NA	Below
Methylene Chloride	75-09-2	0.00%	0.0003%					9.21E-06	4.61E-09	1.07E-02	5.35E-06	9.21E-06	4.61E-09	1.07E-02	5.35E-06	1.60E-03	Below
MTBE	596899	0.00%	ND													NA	Below
Styrene	100-42-5	0.0073%	0.0054%	8.50E-05	4.25E-08	9.87E-02	4.93E-05	1.84E-04	9.21E-08	2.14E-01	1.07E-04	2.69E-04	1.35E-07	3.13E-01	1.56E-04	6.67E+00	Below
Tetrachloroethene	127-18-4	0.0077%	ND	8.97E-05	4.48E-08	1.04E-01	5.20E-05					8.97E-05	4.48E-08	1.04E-01	5.20E-05	1.30E-02	Below
Toluene	108-88-3	0.21%	0.06%	2.45E-03	1.22E-06	2.84E+00	1.42E-03	2.12E-03	1.06E-06	2.46E+00	1.23E-03	4.56E-03	2.28E-06	5.29E+00	2.65E-03	2.50E+01	Below
1,1,1-Trichloroethane	71-55-6	0.00%	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00									NA	Below
Trichloroethene	79-01-6	0.00%	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00									NA	Below
Trichlorofluoromethane	75-69-4	0.0013%	ND	1.51E-05	7.57E-09	1.76E-02	8.79E-06					1.51E-05	7.57E-09	1.76E-02	8.79E-06	NA	Below
m-/p-Xylene	1330-20-7	0.41%	0.20%	4.77E-03	2.39E-06	5.54E+00	2.77E-03	6.82E-03	3.41E-06	7.92E+00	3.96E-03	1.16E-02	5.80E-06	1.35E+01	6.73E-03	2.90E+01	Below
o-Xylene	95-47-6	0.08%	0.057%	9.32E-04	4.66E-07	1.08E+00	5.41E-04	1.94E-03	9.72E-07	2.26E+00	1.13E-03	2.88E-03	1.44E-06	3.34E+00	1.67E-03	2.90E+01	Below
Total												7.59E-02	3.80E-05	1.04E+02	5.19E-02		

[a] *EPA AP-42, Table 11.1-15 (December 2005)*
[b] *EPA AP-42, Table 11.1-16, (December 2005)*
[c] *As listed in IDAPA 58.01.01.586*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Grain Loading Standard

Source Information

Manufacturer:	
Model No:	
Fuel:	Natural Gas
	Diesel
	Waste Oil

Dryer Data

PM Emission Rate (NG):	0.64	lb/hr
PM Emission Rate (Diesel):	0.64	lb/hr
PM Emission Rate (Waste Oil):	0.64	lb/hr

Exit/Flue Gas Flow Rate Calculation

ACFM[a]	20,000	acfm
Stack Temperature[a]	744.67	R
Stack Pressure[a]	30.3	inHg
Stack Moisture[a]	21	%

Exit flow rate: = ACFM(Std T{°R}/Stack T{°R})(Stack P {inHg}/Std P{inHg})((100-%H20)/100))

Exit flow rate: = 11,345 dscfm

Grain loading

Calculated: Natural Gas	0.01	gr/dscf
Calculated: Diesel	0.01	gr/dscf
Calculated: Waste Oil	0.01	gr/dscf
NSPS Loading Standard [40 CFR 60.92(a)(1)]:	0.04	gr/dscf

Result:	**Meet the grain loading standard:**	**Yes**

[a] *Supplied by Knife River, Inc.*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Asphalt Storage Tank Heater Grain Loading Calculation

Exit/Flue Gas Flow Rate Calculation

ACFM[a]	5,028 acfm
Stack Temperature[a]	286 °F
Stack Pressure[a]	29.92 inHg
Stack Moisture[a]	18 %
Exit flow rate:	= ACFM(Std T{°R}/Stack T{°R})(Stack P {inHg}/Std P{inHg})((100-%H20)/100))
Exit flow rate: =	2,918 dscfm

Grain loading

Calculated[b]:	0.031 gr/dscf
Loading Standard (IDAPA 58.01.01.675):	0.050 gr/dscf
Result:	Meet the grain loading standard: Yes

Heater Data

Exit flowrate	2,918
PM Emission Rate:	0.02 lb/hr
Fuel:	Natural Gas

Grain loading

Calculated[b]:	0.001 gr/dscf
Loading Standard (IDAPA 58.01.01.675):	0.015 gr/dscf
Result:	Meet the grain loading standard: Yes

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Drum Mix Dryer Potential to Emit Calculations

Assumptions:

Rated Capacity	97.0 MMBtu/hr
	280 t/hr max throughput rate
	325,000 t/yr max throughput rate
Air Pollution Control Device	Baghouse
Control Device Efficiency (%)	99.9

Fuel:

Natural Gas[a]	1050 Btu/scf

Calculations

Criteria Pollutants [b]

Pollutant	EF (Natural Gas) lb/ton HMA	PTE lb/hr	PTE t/yr
NOx	0.026	0.73	0.42
CO	0.13	3.64	2.11
PM-10[c]	0.023	0.64	0.37
SO_2	0.0034	0.10	0.06
VOC	0.032	0.90	0.52

Pollutant	EF (Diesel) lb/ton HMA	PTE lb/hr	PTE t/yr
NOx	0.055	1.54	0.89
CO	0.13	3.64	2.11
PM-10[c]	0.023	0.64	0.37
SO_2	0.011	0.31	0.18
VOC	0.032	0.90	0.52

Pollutant	EF (No 2 Waste Oil) lb/ton HMA	PTE lb/hr	PTE t/yr
NOx	0.055	1.54	0.89
CO	0.13	3.64	2.11
PM-10[c]	0.023	0.64	0.37
SO_2	0.058	1.62	0.94
VOC	0.032	0.90	0.52
HCl	0.00021	0.01	0.00

[a] *Heat Value from the United States Environmental Protection Agency (EPA) AP-42, Appendix A, Typical Parameters of Various Fuels, (From web site, December 2005)*

[b] *CO, NO_x, SO_2 from EPA AP-42, Table 11.1-7 (December, 2005), VOC from Table 11.1-8, (December, 2005)*

[c] *Total PM for a dryer with a fabric filter, EPA AP-42, Table 11.1-3 (December 2005). Assume PM is equal to PM-10.*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Drum Mix Dryer Potential to Emit Calculations (HAP)

Hazardous Air Pollutants (Diesel Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
Non PAH						
Benzene	71-43-2	0.00039	1.09E-01	6.34E-02	8.00E-04	**Exceeds**
Ethylbenzene	100-41-4	0.00024	6.72E-02	3.90E-02	2.90E+01	Below
Formaldehyde	50-00-0	0.0031	8.68E-01	5.04E-01	5.10E-04	**Exceeds**
Hexane	110-54-3	0.00092	2.58E-01	1.50E-01	1.20E+01	Below
Isooctane (2,2,4-trimethylpentane)	540-84-1	4.00E-05	1.12E-02	6.50E-03	NA	
Methyl chloroform	71-55-6	4.80E-05	1.34E-02	7.80E-03	1.27E+02	Below
Toluene	108-88-3	0.0029	8.12E-01	4.71E-01	2.50E+01	Below
Xylene	1330-20-7	0.0002	5.60E-02	3.25E-02	2.90E+01	Below
PAH						
2-Methylnaphthalene	91-57-6	1.70E-04	4.76E-02	2.76E-02		
Acenaphthene	83-32-9	1.40E-06	3.92E-04	2.28E-04		
Acenaphthylene	208-96-8	2.20E-05	6.16E-03	3.58E-03		
Anthracene	120-12-7	3.10E-06	8.68E-04	5.04E-04		
Benzo(a)anthracene	56-55-3	2.10E-07	5.88E-05	3.41E-05		
Benzo(a)pyrene	50-32-8	9.80E-09	2.74E-06	1.59E-06		
Benzo(b)fluoranthene	205-99-2	1.00E-07	2.80E-05	1.63E-05		
Benzo(e)pyrene	192-97-2	1.10E-07	3.08E-05	1.79E-05		
Benzo(g,h,i)perylene	191-24-2	4.00E-08	1.12E-05	6.50E-06		
Benzo(k)fluoranthene	207-08-9	4.10E-08	1.15E-05	6.66E-06		
Chrysene	218-01-9	1.80E-07	5.04E-05	2.93E-05		
Fluoranthene	206-44-0	6.10E-07	1.71E-04	9.91E-05		
Fluorene	86-73-7	1.10E-05	3.08E-03	1.79E-03		
Indeno(1,2,3-cd)pyrene	193-39-5	7.00E-09	1.96E-06	1.14E-06		
Naphthalene	91-20-3	6.50E-04	1.82E-01	1.06E-01		
Perylene	198-55-0	8.80E-09	2.46E-06	1.43E-06		
Phenanthrene	85-01-8	2.30E-05	6.44E-03	3.74E-03		
Pyrene	129-00-0	3.00E-06	8.40E-04	4.88E-04		
Total for Comparison [c]			1.84E-04		9.10E-05	**Exceeds**
Total			2.44E+00	1.42E+00		

Non-HAP Organic Compounds (Diesel Fired Dryer with Fabric Filter) [a]

Pollutant	CAS	EF	PTE		IDAPA 58.01.01.585/586 - EL	Comparison
		lb/ton HMA	lb/hr	t/hr	(lb/hr)	
Butane	106-97-8	6.70E-04	1.88E-01	1.09E-01		
Ethylene	74-85-1	7.00E-03	1.96E+00	1.14E+00		
Heptane	142-82-5	9.40E-03	2.63E+00	1.53E+00	109	Below
2-Methyl-1-pentene	763-29-1	4.00E-03	1.12E+00	6.50E-01		
2-Methyl--2-butene	513-35-9	5.80E-04	1.62E-01	9.43E-02		
3-Methylpentane	96-14-0	1.90E-04	5.32E-02	3.09E-02		
1-Pentene	109-67-1	2.20E-03	6.16E-01	3.58E-01		
n-Pentane	109-66-0	2.10E-04	5.88E-02	3.41E-02	1.18E+02	Below
Total			6.79E+00	3.94E+00		

Metal Air Pollutants (Diesel Fired Dryer with Fabric Filter) [c]

Pollutant	CAS	EF	PTE		IDAPA 58.01.01.585/586 - EL	Comparison
		lb/ton HMA	lb/hr	t/hr	(lb/hr)	
Antimony	7440-36-0	1.80E-07	5.04E-05	2.93E-05	0.033	Below
Arsenic	7440-38-2	5.60E-07	1.57E-04	9.10E-05	1.50E-06	**Exceeds**
Barium	7440-39-3	5.80E-06	1.62E-03	9.43E-04	0.033	Below
Cadmium	7440-43-9	4.10E-07	1.15E-04	6.66E-05	3.70E-06	**Exceeds**
Chromium	7440-47-3	5.50E-06	1.54E-03	8.94E-04	5.60E-07	**Exceeds**
Cobalt	7440-48-4	2.60E-08	7.28E-06	4.23E-06	0.0033	Below
Copper	7440-50-8	3.10E-06	8.68E-04	5.04E-04	0.013	Below
Hexavalent chromium	7440-47-3	4.50E-07	1.26E-04	7.31E-05	5.60E-07	**Exceeds**
Lead		1.50E-05	4.20E-03	2.44E-03		
Manganese (fume)	7439-96-5	7.70E-06	2.16E-03	1.25E-03	0.067	Below
Mercury	7439-97-6	2.60E-06	7.28E-04	4.23E-04	0.001	Below
Nickel	7440-02-0	6.30E-05	1.76E-02	1.02E-02	2.70E-05	**Exceeds**
Phosphorus	7723-14-0	2.80E-05	7.84E-03	4.55E-03	0.007	**Exceeds**
Silver	7440-22-4	4.80E-07	1.34E-04	7.80E-05	0.007	Below
Selenium	7782-49-2	3.50E-07	9.80E-05	5.69E-05	0.013	Below
Thallium	7440-28-0	4.10E-09	1.15E-06	6.66E-07	0.007	Below
Zinc	7440-66-6	6.10E-05	1.71E-02	9.91E-03	0.667	Below
Total			5.44E-02	3.16E-02		

Dioxins (Diesel Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
2,3,7,8-TCDD	1746-01-6	2.10E-13	2.72E-10	1.58E-10		
Total TCDD		9.30E-13	1.04E-09	6.01E-10		
1,2,3,7,8-PeCDD	40321-76-4	3.10E-13	8.68E-11	5.04E-11		
Total PeCDD		2.20E-11	6.16E-09	3.58E-09		
1,2,3,4,7,8-HxCDD	39227-28-6	4.20E-13	1.18E-10	6.83E-11		
1,2,3,6,7,8-HxCDD	57653-85-7	1.30E-12	3.64E-10	2.11E-10		
1,2,3,7,8,9-HxCDD	19408-24-3	9.80E-13	2.74E-10	1.59E-10		
Total HxCDD		1.20E-11	3.36E-09	1.95E-09		
1,2,3,4,6,7,8-HpCDD	35822-46-9	4.80E-12	1.34E-09	7.80E-10		
Total HpCDD		1.90E-11	5.32E-09	3.09E-09		
Octa CDD	3268-87-9	2.50E-11	7.00E-09	4.06E-09		
Total PCDD		7.90E-11	2.21E-08	1.28E-08		
Total			4.75E-08	2.75E-08		

Furans (Diesel Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
2,3,7,8-TCDF	51207-31-9	9.70E-13	2.72E-10	1.58E-10		
Total TCDF		3.70E-12	1.04E-09	6.01E-10		
1.2.3.7.8-PeCDF		4.30E-12	1.20E-09	6.99E-10		
2,3,4,7,8-PeCDF		8.40E-13	2.35E-10	1.37E-10		
Total PCDF		8.40E-11	2.35E-08	1.37E-08		
1,2,3,4,7,8-HxCDF		4.00E-12	1.12E-09	6.50E-10		
1,2,3,6,7,8-HxCDF		1.20E-12	3.36E-10	1.95E-10		
2,3,4,6,7,8-HxCDF		1.90E-12	5.32E-10	3.09E-10		
1,2,3,7,8,9-HxCDF		8.40E-12	2.35E-09	1.37E-09		
Total HxCDF		1.30E-11	3.64E-09	2.11E-09		
1,2,3,4,6,7,8-HpCDF		6.50E-12	1.82E-09	1.06E-09		
1,2,3,4,7,8,9-HpCDF		2.70E-12	7.56E-10	4.39E-10		
Total HpCDF		1.00E-11	2.80E-09	1.63E-09		
Octa CDF	39001-02-0	4.80E-12	1.34E-09	7.80E-10		
Total PCDF		4.00E-11	1.12E-08	6.50E-09		
Total PCDD/PCDF		1.20E-10	3.36E-08	1.95E-08		
Total			8.58E-08	4.98E-08		

[a] *EPA AP-42, Table 11.1-10, (December, 2005)*

[b] *EPA AP-42, Table 11.1-12, (December, 2005)*

[c] *As listed in IDAPA 58.01.01.586 (December, 2005)*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Drum Mix Dryer Potential to Emit Calculations (HAP)

Hazardous Air Pollutants (Natural Gas Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
Non PAH						
Benzene	71-43-2	0.00039	1.09E-01	6.34E-02	8.00E-04	**Exceeds**
Ethylbenzene	100-41-4	0.00024	6.72E-02	3.90E-02	2.90E+01	Below
Formaldehyde	50-00-0	0.0031	8.68E-01	5.04E-01	5.10E-04	**Exceeds**
Hexane	110-54-3	0.00092	2.58E-01	1.50E-01	1.20E+01	Below
Isooctane (2,2,4-trimethylpentane)	540-84-1	4.00E-05	1.12E-02	6.50E-03	NA	
Methyl chloroform	71-55-6	4.80E-05	1.34E-02	7.80E-03	1.27E+02	Below
Toluene	108-88-3	0.00015	4.20E-02	2.44E-02	2.50E+01	Below
Xylene	1330-20-7	0.0002	5.60E-02	3.25E-02	2.90E+01	Below
PAH						
2-Methylnaphthalene	91-57-6	7.40E-05	2.07E-02	1.20E-02		
Acenaphthene	83-32-9	1.40E-06	3.92E-04	2.28E-04		
Acenaphthylene	208-96-8	8.60E-06	2.41E-03	1.40E-03		
Anthracene	120-12-7	2.20E-07	6.16E-05	3.58E-05		
Benzo(a)anthracene	56-55-3	2.10E-07	5.88E-05	3.41E-05		
Benzo(a)pyrene	50-32-8	9.80E-09	2.74E-06	1.59E-06		
Benzo(b)fluoranthene	205-99-2	1.00E-07	2.80E-05	1.63E-05		
Benzo(e)pyrene	192-97-2	1.10E-07	3.08E-05	1.79E-05		
Benzo(g,h,i)perylene	191-24-2	4.00E-08	1.12E-05	6.50E-06		
Benzo(k)fluoranthene	207-08-9	4.10E-08	1.15E-05	6.66E-06		
Chrysene	218-01-9	1.80E-07	5.04E-05	2.93E-05		
Fluoranthene	206-44-0	6.10E-07	1.71E-04	9.91E-05		
Fluorene	86-73-7	3.80E-06	1.06E-03	6.18E-04		
Indeno(1,2,3-cd)pyrene	193-39-5	7.00E-09	1.96E-06	1.14E-06		
Naphthalene	91-20-3	9.00E-05	2.52E-02	1.46E-02		
Perylene	198-55-0	8.80E-09	2.46E-06	1.43E-06		
Phenanthrene	85-01-8	7.60E-06	2.13E-03	1.24E-03		
Pyrene	129-00-0	5.40E-07	1.51E-04	8.78E-05		
Total for Comparison [c]			1.84E-04		9.10E-05	**Exceeds**
Total			1.48E+00	8.57E-01		

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Drum Mix Dryer Potential to Emit Calculations (HAP)

Non-HAP Organic Compounds (Natural Gas Fired Dryer with Fabric Filter) [a]

Pollutant	CAS	EF	PTE		IDAPA 58.01.01.585/586 - EL	Comparison
		lb/ton HMA	lb/hr	t/hr	(lb/hr)	
Butane	106-97-8	6.70E-04	1.88E-01	1.09E-01		
Ethylene	74-85-1	7.00E-03	1.96E+00	1.14E+00		
Heptane	142-82-5	9.40E-03	2.63E+00	1.53E+00	109	Below
2-Methyl-1-pentene	763-29-1	4.00E-03	1.12E+00	6.50E-01		
2-Methyl--2-butene	513-35-9	5.80E-04	1.62E-01	9.43E-02		
3-Methylpentane	96-14-0	1.90E-04	5.32E-02	3.09E-02		
1-Pentene	109-67-1	2.20E-03	6.16E-01	3.58E-01		
n-Pentane	109-66-0	2.10E-04	5.88E-02	3.41E-02	1.18E+02	Below
Total			6.79E+00	3.94E+00		

Metal Air Pollutants (Natural Gas Fired Dryer with Fabric Filter) [c]

Pollutant	CAS	EF	PTE		IDAPA 58.01.01.585/586 - EL	Comparison
		lb/ton HMA	lb/hr	t/hr	(lb/hr)	
Antimony	7440-36-0	1.80E-07	5.04E-05	2.93E-05	0.033	Below
Arsenic	7440-38-2	5.60E-07	1.57E-04	9.10E-05	1.50E-06	**Exceeds**
Barium	7440-39-3	5.80E-06	1.62E-03	9.43E-04	0.033	Below
Cadmium	7440-43-9	4.10E-07	1.15E-04	6.66E-05	3.70E-06	**Exceeds**
Chromium	7440-47-3	5.50E-06	1.54E-03	8.94E-04	5.60E-07	**Exceeds**
Cobalt	7440-48-4	2.60E-08	7.28E-06	4.23E-06	0.0033	Below
Copper	7440-50-8	3.10E-06	8.68E-04	5.04E-04	0.013	Below
Hexavalent chromium	7440-47-3	4.50E-07	1.26E-04	7.31E-05	5.60E-07	**Exceeds**
Lead		6.20E-07	1.74E-04	1.01E-04		
Manganese (fume)	7439-96-5	7.70E-06	2.16E-03	1.25E-03	0.067	Below
Mercury	7439-97-6	2.40E-07	6.72E-05	3.90E-05	0.001	Below
Nickel	7440-02-0	6.30E-05	1.76E-02	1.02E-02	2.70E-05	**Exceeds**
Phosphorus	7723-14-0	2.80E-05	7.84E-03	4.55E-03	0.007	**Exceeds**
Silver	7440-22-4	4.80E-07	1.34E-04	7.80E-05	0.007	Below
Selenium	7782-49-2	3.50E-07	9.80E-05	5.69E-05	0.013	Below
Thallium	7440-28-0	4.10E-09	1.15E-06	6.66E-07	0.007	Below
Zinc	7440-66-6	6.10E-05	1.71E-02	9.91E-03	0.667	Below
Total			4.97E-02	2.88E-02		

[a] *EPA AP-42, Table 11.1-10, (December, 2005)*

[b] *EPA AP-42, Table 11.1-12, (December, 2005)*

[c] *As listed in IDAPA 58.01.01.586 (December, 2005)*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
Drum Mix Dryer Potential to Emit Calculations (HAP)

Hazardous Air Pollutants (Waste Oil Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
Non PAH						
Acetaldehyde	75-07-0	1.30E-03	3.64E-01	2.11E-01	3.00E-03	**Exceeds**
Acrolein	107-02-8	2.60E-05	7.28E-03	4.23E-03	1.70E-02	Below
Benzene	71-43-2	3.90E-04	1.09E-01	6.34E-02	8.00E-04	**Exceeds**
Ethylbenzene	100-41-4	2.40E-04	6.72E-02	3.90E-02	2.90E+01	Below
Formaldehyde	50-00-0	3.10E-03	8.68E-01	5.04E-01	5.10E-04	**Exceeds**
Hexane	110-54-3	9.20E-04	2.58E-01	1.50E-01	1.20E+01	Below
Isooctane (2,2,4-trimethylpentane)	540-84-1	4.00E-05	1.12E-02	6.50E-03	NA	
Methyl Ethyl Ketone	78-93-3	2.00E-05	5.60E-03	3.25E-03	3.93E+01	Below
Propionaldehyde	123-38-6	1.30E-04	3.64E-02	2.11E-02	2.87E-02	**Exceeds**
Quinone	106-51-4	1.60E-04	4.48E-02	2.60E-02	2.70E-02	**Exceeds**
Methyl chloroform	71-55-6	4.80E-05	1.34E-02	7.80E-03	1.27E+02	Below
Toluene	108-88-3	2.90E-03	8.12E-01	4.71E-01	2.50E+01	Below
Xylene	1330-20-7	2.00E-04	5.60E-02	3.25E-02	2.90E+01	Below
PAH						
2-Methylnaphthalene	91-57-6	1.70E-04	4.76E-02	2.76E-02		
Acenaphthene	83-32-9	1.40E-06	3.92E-04	2.28E-04		
Acenaphthylene	208-96-8	2.20E-05	6.16E-03	3.58E-03		
Anthracene	120-12-7	3.10E-06	8.68E-04	5.04E-04		
Benzo(a)anthracene	56-55-3	2.10E-07	5.88E-05	3.41E-05		
Benzo(a)pyrene	50-32-8	9.80E-09	2.74E-06	1.59E-06		
Benzo(b)fluoranthene	205-99-2	1.00E-07	2.80E-05	1.63E-05		
Benzo(e)pyrene	192-97-2	1.10E-07	3.08E-05	1.79E-05		
Benzo(g,h,i)perylene	191-24-2	4.00E-08	1.12E-05	6.50E-06		
Benzo(k)fluoranthene	207-08-9	4.10E-08	1.15E-05	6.66E-06		
Chrysene	218-01-9	1.80E-07	5.04E-05	2.93E-05		
Fluoranthene	206-44-0	6.10E-07	1.71E-04	9.91E-05		
Fluorene	86-73-7	1.10E-05	3.08E-03	1.79E-03		
Indeno(1,2,3-cd)pyrene	193-39-5	7.00E-09	1.96E-06	1.14E-06		
Naphthalene	91-20-3	6.50E-04	1.82E-01	1.06E-01		
Perylene	198-55-0	8.80E-09	2.46E-06	1.43E-06		
Phenanthrene	85-01-8	2.30E-05	6.44E-03	3.74E-03		
Pyrene	129-00-0	3.00E-06	8.40E-04	4.88E-04		
POM				8.90E-05		
Total for Comparison [c]			1.84E-04			
Total			2.53E+00	1.68E+00		

Non-HAP Organic Compounds (Waste Oil Fired Dryer with Fabric Filter) [a]

Pollutant	CAS	EF	PTE		IDAPA 58.01.01.585/586 - EL	Comparison
		lb/ton HMA	lb/hr	t/hr	(lb/hr)	
Acetone	67-64-1	8.30E-04	2.32E-01	1.35E-01	1.19E+02	Below
Benzaldehyde	100-52-7	1.10E-04	3.08E-02	1.79E-02		
Butane	106-97-8	6.70E-04	1.88E-01	1.09E-01		
Butyraldehyde	78-84-2	1.60E-04	4.48E-02	2.60E-02		
Crotonaldehyde	4170-30-3	8.60E-05	2.41E-02	1.40E-02		
Ethylene	74-85-1	7.00E-03	1.96E+00	1.14E+00		
Heptane	142-82-5	9.40E-03	2.63E+00	1.53E+00	1.09E+02	Below
Hexanal	66-25-1	1.10E-04	3.08E-02	1.79E-02		
Isovaleraldehyde	590-86-3	3.20E-05	8.96E-03	5.20E-03		
2-Methyl-1-pentene	763-29-1	4.00E-03	1.12E+00	6.50E-01		
2-Methyl--2-butene	513-35-9	5.80E-04	1.62E-01	9.43E-02		
3-Methylpentane	96-14-0	1.90E-04	5.32E-02	3.09E-02		
1-Pentene	109-67-1	2.20E-03	6.16E-01	3.58E-01		
n-Pentane	109-66-0	2.10E-04	5.88E-02	3.41E-02	1.18E+02	Below
Valeraldehyde	110-62-3	6.70E-05	1.88E-02	1.09E-02	1.17E+01	Below
Total			7.18E+00	4.00E+00		

Metal Air Pollutants (Waste Oil Fired Dryer with Fabric Filter) [c]

Pollutant	CAS	EF	PTE		IDAPA 58.01.01.585/586 - EL	Comparison
		lb/ton HMA	lb/hr	t/hr	(lb/hr)	
Antimony	7440-36-0	1.80E-07	5.04E-05	2.93E-05	0.033	Below
Arsenic	7440-38-2	5.60E-07	1.57E-04	9.10E-05	1.50E-06	**Exceeds**
Barium	7440-39-3	5.80E-06	1.62E-03	9.43E-04	0.033	Below
Cadmium	7440-43-9	4.10E-07	1.15E-04	6.66E-05	3.70E-06	**Exceeds**
Chromium	7440-47-3	5.50E-06	1.54E-03	8.94E-04	5.60E-07	**Exceeds**
Cobalt	7440-48-4	2.60E-08	7.28E-06	4.23E-06	0.0033	Below
Copper	7440-50-8	3.10E-06	8.68E-04	5.04E-04	0.013	Below
Hexavalent chromium	7440-47-3	4.50E-07	1.26E-04	7.31E-05	5.60E-07	**Exceeds**
Lead		1.50E-05	4.20E-03	2.44E-03		
Manganese (fume)	7439-96-5	7.70E-06	2.16E-03	1.25E-03	0.067	Below
Mercury	7439-97-6	2.60E-06	7.28E-04	4.23E-04	0.001	Below
Nickel	7440-02-0	6.30E-05	1.76E-02	1.02E-02	2.70E-05	**Exceeds**
Phosphorus	7723-14-0	2.80E-05	7.84E-03	4.55E-03	0.007	**Exceeds**
Silver	7440-22-4	4.80E-07	1.34E-04	7.80E-05	0.007	Below
Selenium	7782-49-2	3.50E-07	9.80E-05	5.69E-05	0.013	Below
Thallium	7440-28-0	4.10E-09	1.15E-06	6.66E-07	0.007	Below
Zinc	7440-66-6	6.10E-05	1.71E-02	9.91E-03	0.667	Below
Total			5.44E-02	3.16E-02		

Dioxins (Waste Oil Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
2,3,7,8-TCDD	1746-01-6	2.10E-13	5.88E-11	3.41E-11		
Total TCDD		9.30E-13	2.60E-10	1.51E-10	1.50E-10	Below
1,2,3,7,8-PeCDD	40321-76-4	3.10E-13	8.68E-11	5.04E-11		
Total PeCDD		2.20E-11	6.16E-09	3.58E-09		
1,2,3,4,7,8-HxCDD	39227-28-6	4.20E-13	1.18E-10	6.83E-11		
1,2,3,6,7,8-HxCDD	57653-85-7	1.30E-12	3.64E-10	2.11E-10		
1,2,3,7,8,9-HxCDD	19408-24-3	9.80E-13	2.74E-10	1.59E-10		
Total HxCDD		1.20E-11	3.36E-09	1.95E-09		
1,2,3,4,6,7,8-HpCDD	35822-46-9	4.80E-12	1.34E-09	7.80E-10		
Total HpCDD		1.90E-11	5.32E-09	3.09E-09		
Octa CDD	3268-87-9	2.50E-11	7.00E-09	4.06E-09		
Total PCDD		7.90E-11	2.21E-08	1.28E-08		
Total			4.65E-08	2.70E-08		

Furans (Waste Oil Fired dryer with Fabric Filter) [a]

Pollutant	CAS #	EF lb/ton HMA	PTE lb/hr	PTE t/yr	IDAPA 58.01.01.585/586 - EL (lb/hr)	Comparison
2,3,7,8-TCDF	51207-31-9	9.70E-13	2.72E-10	1.58E-10		
Total TCDF		3.70E-12	1.04E-09	6.01E-10		
1.2.3.7.8-PeCDF		4.30E-12	1.20E-09	6.99E-10		
2,3,4,7,8-PeCDF		8.40E-13	2.35E-10	1.37E-10		
Total PCDF		8.40E-11	2.35E-08	1.37E-08		
1,2,3,4,7,8-HxCDF		4.00E-12	1.12E-09	6.50E-10		
1,2,3,6,7,8-HxCDF		1.20E-12	3.36E-10	1.95E-10		
2,3,4,6,7,8-HxCDF		1.90E-12	5.32E-10	3.09E-10		
1,2,3,7,8,9-HxCDF		8.40E-12	2.35E-09	1.37E-09		
Total HxCDF		1.30E-11	3.64E-09	2.11E-09		
1,2,3,4,6,7,8-HpCDF		6.50E-12	1.82E-09	1.06E-09		
1,2,3,4,7,8,9-HpCDF		2.70E-12	7.56E-10	4.39E-10		
Total HpCDF		1.00E-11	2.80E-09	1.63E-09		
Octa CDF	39001-02-0	4.80E-12	1.34E-09	7.80E-10		
Total PCDF		4.00E-11	1.12E-08	6.50E-09		
Total PCDD/PCDF		1.20E-10	3.36E-08	1.95E-08		
Total			8.58E-08	4.98E-08		

[a] *EPA AP-42, Table 11.1-10, (December, 2005)*

[b] *EPA AP-42, Table 11.1-12, (December, 2005)*

[c] *As listed in IDAPA 58.01.01.586 (December, 2005)*

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
125 KW Generator Potential to Emit Calculations

Generator Name	**125 KW**
Model No.	
Brake Horsepower Rating (hp)	188
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	4.5
Maximum Heat Input Rating (Btu/hr)	630,000
Maximum Hours of Operation	2,322
Maximum Firing Rate (gals/yr)	10,449
Annual Operation Limit (hrs/yr)	2,322
Annual Firing Rate (gals/yr)	10,449
Heat Value of Fuel (Btu/gal)	140,000

Uncontrolled Potential to Emit					
Criteria Pollutant	**CAS No.**	**Emission Factor[1] (lb/MMBtu)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**
Total Particulate Matter (PM_{10})[3]		0.31	0.20	453	0.23
Nitrogen Oxides (NOx)		4.41	2.78	6,451	3.23
Sulfur Oxides		0.29	0.18	424	0.21
Carbon Monoxide (CO)		0.95	0.60	1,390	0.69
TOC[4]		0.350	0.22	512	0.26

				Uncontrolled Potential to Emit				
Compound	**CAS Number**		**Emission Factor[4] (lb/MMBtu)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**	**IDAPA 58.01.01.585/586 - EL (lb/hr)**	**PTE Emission Rate vs. EL**
1,3-Butadiene	106-99-0		3.91E-05	2.46E-05	5.72E-02	2.86E-05	2.40E-05	**Exceeds**
Acetaldehyde	75-07-0		7.67E-04	4.83E-04	1.12E+00	5.61E-04	3.00E-03	Below
Acrolein	107-02-8		9.25E-05	5.83E-05	1.35E-01	6.77E-05	1.70E-02	Below
Benzene	71-43-2		9.33E-04	5.88E-04	1.36E+00	6.82E-04	8.00E-04	Below
Benzo(a)pyrene*	50-32-8		1.88E-07	1.18E-07	2.75E-04	1.38E-07	2.00E+06	Below
Formaldehyde	50-00-0		1.18E-03	7.43E-04	1.73E+00	8.63E-04	5.10E-04	**Exceeds**
Naphthalene*	91-20-3		8.48E-05	5.34E-05	1.24E-01	6.20E-05	3.33E+00	Below
Propylene			2.58E-03	1.63E-03	3.77E+00	1.89E-03		
Toluene	108-88-3		4.09E-04	2.58E-04	5.98E-01	2.99E-04	2.50E+01	Below
Xylenes	1330-20-7		2.85E-04	1.80E-04	4.17E-01	2.08E-04	2.90E+01	Below
Total PAH[5]			8.30E-05	5.23E-05	1.21E-01	6.07E-05	9.10E-05	Below
HAPs						**0.004**		

Notes:
[1] Emission factor for SO_2 was utilized from EPA AP-42, Section 3.3 Gasoline and Diesel Industrial Engines,Table 3.3-1.
[2] PM emission factor is assumed to equal PM_{10}.
[3] TOC is assumed to be equal to VOC, Emission factor for TOC for exhaust only.
[4] Toxic emission factors were utilized from EPA AP-42, Section 3.3 Gasoline and Diesel Industrial Engines,Table 3.3-2.
[5] Based on removing benzo(a)pyrene and naphthalene from Total PAH, EPA AP-42, Section 3.3 Gasoline and Diesel Industrial Engines,Table 3.3-2.

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
750 KW Generator Potential to Emit Calculations

Generator Name	**750 KW**
Model No.	
Brake Horsepower Rating (hp)	1,125
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	27.0
Maximum Heat Input Rating (Btu/hr)	3,726,000
Maximum Hours of Operation	1,161
Maximum Firing Rate (gals/yr)	31,347
Annual Operation Limit (hrs/yr)	1,161
Annual Firing Rate (gals/yr)	31,347
Heat Value of Fuel (Btu/gal)	138,000

Uncontrolled Potential to Emit					
Criteria Pollutant	**CAS No.**	**Emission Factor[1] (lb/MMBtu)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**
Total Particulate Matter (PM)[2]		0.1	0.37	433	0.22
Nitrogen Oxides (NOx)[3]		3.2	11.92	13,843	6.92
Sulfur Oxides[4]		0.505	1.88	2,185	1.09
Carbon Monoxide (CO)		0.85	3.17	3,677	1.84
TOC[5]		0.09	0.34	389	0.19

				Uncontrolled Potential to Emit				
Compound	**CAS Number**		**Emission Factor[6] (lb/MMBtu)**	**Emission Rate (lb/hr)**	**Emission Rate (lb/yr)**	**Emission Rate (ton/yr)**	**IDAPA 58.01.01.585/586 - EL (lb/hr)**	**PTE Emission Rate vs. EL**
Acetaldehyde	75-07-0		2.52E-05	9.39E-05	1.09E-01	5.45E-05	3.00E-03	Below
Acrolein	107-02-8		7.88E-06	2.94E-05	3.41E-02	1.70E-05	1.70E-02	Below
Benzene	71-43-2		7.76E-04	2.89E-03	3.36E+00	1.68E-03	8.00E-04	**Exceeds**
Benzo(a)pyrene*	50-32-8		2.57E-07	9.58E-07	1.11E-03	5.56E-07	2.00E+06	Below
Formaldehyde	50-00-0		7.89E-05	2.94E-04	3.41E-01	1.71E-04	5.10E-04	Below
Naphthalene	91-20-3		1.30E-04	4.84E-04	5.62E-01	2.81E-04	3.33E+00	Below
Propylene			2.79E-03	1.04E-02	1.21E+01	6.03E-03		
Toluene	108-88-3		2.81E-04	1.05E-03	1.22E+00	6.08E-04	2.50E+01	Below
Xylenes	1330-20-7		1.93E-04	7.19E-04	8.35E-01	4.17E-04	2.90E+01	Below
Total PAH[7]			8.17E-05	3.05E-04	3.54E-01	1.77E-04	9.10E-05	**Exceeds**
HAPs						**0.009**		

Notes:

[1] Emission factor for SO_2 was utilized from EPA AP-42, Section 3.4 Large Gasoline and Diesel Industrial Engines,Table 3.4-1.

[2] PM emission factor is assumed to equal PM_{10}.

[3] Uncontrolled emission factor

[4] Sulfur Oxides emission factor based on AP-42 Table 3.4-1 Equation for sulfur where the emission factor equals 1.01 times sulfur content in fuel

[5] TOC (as CH4) is assumed to equal VOC.

[6] Toxic emission factors were utilized from EPA AP-42, Section 3.4 Large Gasoline and Diesel Industrial Engines,Table 3.4-3.

[7] Based on removing benzo(a)pyrene and naphthalene from Total PAH, EPA AP-42, Section 3.4 Large Gasoline and Diesel Industrial Engines,Table 3.4-4.

Hours of operation based on production rates

Knife River, Inc.
Portable Hot-Mix Asphalt Plant Permit Application
10,000 Gallon Deisel Tank

Generator fuel consuption (gal/hr)	27
Hours of operation per year	3,000
Total gallons fuel consumption (gal/yr)	81000

Tank Dimensions						
Length (ft)	Diameter (ft)	Capacity (gal)	Throughput (No/yr)[1]	VOC emissions (lb/yr)[2]	VOC emissions (lb/hr)	VOC emissions (t/yr)
26.75	8	10000	8.1	2.84	3.24E-04	1.42E-03

Emission Type	CAS No	Emission Estimate[3] (lb/yr)	Emission Estimate[4] (lb/hr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
No. 2 Fuel Oil		2.84	3.2E-04	NA	NA

[1] Assumed 2,500 gallons per month usage from November through February, and 8,875 gallons per month usage March through October.

[2] Volatile Speciation for Dieseel based on USAF Institute for Environment, Safety, and Occupational Risk Analysis, 1999

[3] Emission estimate based on EPA Tanks Program Version 4.0.9d -see attached

[4] UST pound per hour emissions based on 8, 760 hours per year

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	10,000 Gallon AST
City:	McCall
State:	Idaho
Company:	Knife River
Type of Tank:	Horizontal Tank
Description:	10,000 Gallon AST, Diesel

Tank Dimensions

Shell Length (ft):	26.75
Diameter (ft):	8
Volume (gallons):	10,000.00
Turnovers:	8.1
Net Throughput(gal/yr):	81,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Boise, Idaho (Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

10,000 Gallon AST - Horizontal Tank
McCall, Idaho

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia Avg.	Min.
Distillate fuel oil no. 2	All	52.81	46.88	58.74	50.94	0.0051	0.0041