TABLE REVISIONS TO

REQUEST TO REDESIGNATE KENTUCKY COUNTIES
LOCATED WITHIN THE

CINCINNATI, OH-KY-IN MSA
8-HOUR OZONE NONATTAINMENT AREA

Prepared by:
Kentucky Energy and Environment Cabinet
Division for Air Quality

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The United States Environmental Protection Agency (U.S. EPA) recently reviewed Kentucky's submittal of the request to redesignate the Kentucky counties located within the Cincinnati, OH-KY-IN Metropolitan Statistical Area's 8-Hour Ozone Nonattainment Area. As part of Kentucky's response to U.S. EPA comments, the following tables have been updated with revised data.

Table 13
Cincinnati OH-KY-IN Area 2008 8-Hour Ozone Nonattainment Area
Projected VOC Emissions
(TSD)

VOC				
County	**2011**	**2014**	**2020**	**2030**
Boone	9.60	8.54	7.00	5.84
Campbell	3.96	3.40	2.55	2.10
Kenton	6.76	5.88	4.57	3.95
Butler	25.85	22.70	19.41	17.63
Clermont	14.13	12.39	10.17	9.07
Clinton	5.61	4.77	3.99	3.75
Hamilton	60.07	51.85	42.48	37.42
Warren	16.67	14.21	11.59	9.93
Dearborn	7.31	8.29	6.52	6.42
TOTAL	**149.96**	**132.03**	**108.28**	**96.11**

Table 16
Kenton County, Kentucky 2008 8-Hour Ozone Nonattainment Area
Projected NOx Emissions
(TSD)

NOx	**Kenton**					
Sector	**2011**	**2014**	**2017**	**2020**	**2025**	**2030**
EGU	0.00	0.00	0.00	0.00	0.00	0.00
Non-EGU	0.01	0.01	0.01	0.01	0.01	0.01
Air	0.00	0.00	0.00	0.00	0.00	0.00
Non-road	0.77	0.64	0.51	0.43	0.35	0.27
Area	1.02	1.02	1.02	1.02	1.02	1.02
On-road	6.53	5.17	3.73	2.28	1.64	0.99
TOTAL	**8.33**	**6.84**	**5.27**	**3.74**	**3.02**	**2.29**

Table 23
Cincinnati OH-KY-IN Area 2008 8-Hour Ozone Nonattainment Area
Projected NOx Emissions
(TSD)

NOx				
County	**2011**	**2014**	**2020**	**2030**
Boone	17.61	16.21	13.59	10.67
Campbell	5.34	4.39	2.39	1.46
Kenton	8.33	6.84	3.74	2.29
Butler	31.98	29.74	21.34	18.22
Clermont	54.48	49.59	36.48	34.60
Clinton	6.20	4.99	3.02	2.10
Hamilton	78.65	62.88	45.94	38.15
Warren	16.29	12.29	8.51	5.95
Dearborn	19.82	13.39	4.14	3.83
TOTAL	**238.70**	**200.32**	**139.15**	**117.27**

Table 35
Kenton County 2008 8-Hour Ozone Nonattainment Area
NOx Emissions and Projections
(TSD)

NOx	Kenton						2020	2030
Sector	**2011**	**2014**	**2017**	**2020**	**2025**	**2030**	**Budget and Safety Margin**	**Budget and Safety Margin**
EGU	0.00	0.00	0.00	0.00	0.00	0.00		
Non-EGU	0.01	0.01	0.01	0.01	0.01	0.01		
Air	0.00	0.00	0.00	0.00	0.00	0.00		
Non-road	0.77	0.64	0.51	0.43	0.35	0.27		
Area	1.02	1.02	1.02	1.02	1.02	1.02		
On-road	6.53	5.17	3.73	2.28	1.64	0.99		
TOTAL	**8.33**	**6.84**	**5.27**	**3.74**	**3.02**	**2.29**	**2.75**	**1.67**

Table 43
Cincinnati, OH-KY-IN MSA
2008 8-Hour Ozone Nonattainment Area
TOTAL Projected VOC Emissions
(TSD)

VOC	2011	2014	2017	2020	2025	2030	Budget and Safety Margin 2020	Budget and Safety Margin 2030
Boone, KY	9.60	8.54	7.71	7.00	6.42	5.84	1.61	1.18
Campbell, KY	3.96	3.40	2.95	2.55	2.34	2.10	0.99	0.68
Kenton, KY	6.76	5.88	5.18	4.57	4.26	3.95	1.50	1.02
Butler, OH	25.85	22.70		19.41		17.63		
Clermont, OH	14.13	12.39		10.17		9.07		
Clinton, OH	5.61	4.77		3.99		3.75		
Hamilton, OH	60.07	51.85		42.48		37.42		
Warren, OH	16.67	14.21		11.59		9.93		
Dearborn, IN	7.31	8.29		6.52		6.42		
Combined Total	**149.96**	**132.03**		**108.28**		**96.11**		

Table 44
Cincinnati, OH-KY-IN MSA
2008 8-Hour Ozone Nonattainment Area
TOTAL Projected NOx Emissions
(TSD)

NOx	2011	2014	2017	2020	2025	2030	Budget and Safety Margin 2020	Budget and Safety Margin 2030
Boone, KY	17.61	16.21	14.86	13.59	12.08	10.67	2.80	1.88
Campbell, KY	5.34	4.39	3.38	2.39	1.93	1.46	1.80	1.09
Kenton, KY	8.32	6.83	5.26	3.73	3.01	2.28	2.75	1.67
Butler, OH	31.98	29.74		21.34		18.22		
Clermont, OH	54.48	49.59		36.48		34.60		
Clinton, OH	6.20	4.99		3.02		2.10		
Hamilton, OH	78.65	62.88		45.94		38.15		
Warren, OH	16.29	12.29		8.51		5.95		
Dearborn, IN	19.82	13.39		4.14		3.83		
Combined Total	**238.69**	**200.31**		**139.14**		**117.26**		

Table 45
Cincinnati, OH-KY-IN MSA
2008 8-Hour Ozone Nonattainment Area
Emission Reductions
(TSD)

	2014	**2030**	**Total Reductions**
VOC	132.03	96.11	**35.92**
NOx	200.31	117.26	**83.05**

REDESIGNATION REQUEST: POPULATION AND GROWTH DATA

Enter Pollutant(s) Here:	O3 (VOC, NOx)			Enter Area Here:		Boone, Campbell, Kenton Counties	
ENTIRE COUNTY	Census 2010 [1]	Base Year 2011 [2]	Attain 2014	Proj 2017	Census 2020 [1]	Proj 2025	Census 2030 [1]
Boone, KY	118,811	121,635	131,704	142,531	153,933	170,104	190,270
Campbell, KY	90,336	90,946	91,178	91,410	91,642	90,870	90,731
Kenton, KY	159,720	160,407	163,054	165,741	168,458	170,991	174,699
AREA TOTAL	368,867	372,988	385,936	399,682	414,033	431,965	455,700

COUNTY	Area % Δ
Boone, KY	57%
Campbell, KY	56%
Kenton, KY	54%

1) Population Projections 2015-2050, Census Data for 2010, 2020, and 2030, "Total Population", Kentucky State Data Center, *http://www.ksdc.louisville.edu/data-downloads/projections/*

2) Population Estimates for 2011 and 2012, "Total Population (2013)", Kentucky State Data Center, *http://ksdc.louisville.edu/index.php/kentucky-demographic-data/estimates/population-and-housing-units*

Δ The measurement function in *Google Earth* was used by KYDAQ's John Gowins to approximate the percentage of each county that was determined to be in the designated nonattainment area.

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton).

POINT SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties			
		VOC Base Year 2011	VOC Attainment 2014	VOC Projected 2017	VOC Projected 2020	VOC Projected 2025	VOC Projected 2030
Facility ID	Facility Name	tpd	tpd	tpd	tpd	tpd	tpd
Boone, KY							
2101500004	Aristech Acrylics LLC	0.04	0.04	0.04	0.04	0.04	0.04
2101500010	Greif Industrial Packaging & Services LLC	0.29	0.29	0.29	0.29	0.29	0.29
2101500018	DRS Environmental Systems Inc	0.05	0.05	0.05	0.05	0.05	0.05
2101500019	Duro Bag Manufacturing	0.04	0.04	0.04	0.04	0.04	0.04
2101500069	Camco Chemical Co	0.04	0.04	0.04	0.04	0.04	0.04
2101500077	Southern Graphic Systems Inc	0.04	0.04	0.04	0.04	0.04	0.04
2101500082	R R Donnelley - Nielsen Plant	0.29	0.29	0.29	0.29	0.29	0.29
2101500086	Duro Bag Mfg Co	0.09	0.09	0.09	0.09	0.09	0.09
2101500088	The Hennegan Co	0.04	0.04	0.04	0.04	0.04	0.04
2101500102	Sweco, Div of M-I, LLC	0.05	0.05	0.05	0.05	0.05	0.05
2101500114	Continental Web Press Inc	0.04	0.04	0.04	0.04	0.04	0.04
2101500120	Schwans Food Manufacturing Inc	0.22	0.22	0.22	0.22	0.22	0.22
2101500126	Keebler Foods Co	0.05	0.05	0.05	0.05	0.05	0.05
2101500142	Abrapower Inc	0.15	0.15	0.15	0.15	0.15	0.15
2101500144	Stonehouse Building Products LLC	0.07	0.07	0.07	0.07	0.07	0.07
2101500146	CW Zumbiel Packaging	0.08	0.08	0.08	0.08	0.08	0.08
	BOONE COUNTY NON-EGU TOTAL	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**
2101500029	Duke Energy KY East Bend	0.16	0.16	0.16	0.16	0.16	0.16
	BOONE COUNTY EGU TOTAL	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**	**0.16**
	BOONE COUNTY AIR (AIRCRAFT)	**0.42**	**0.42**	**0.44**	**0.45**	**0.26**	**0.06**
	BOONE COUNTY GRAND TOTAL	**2.15**	**2.15**	**2.17**	**2.18**	**1.99**	**1.79**

Point sources were divided into two categories: Non-EGU and EGU. Additionally, "Air" (Aircraft) emissions were provided by the Indiana Department of Environmental Management.

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton).

Individual county growth rates were calculated based on EPA's 2011 NEI 2011-2025 point source emission projections. Once 2025 emissions were calculated using these growth rates, 2014, 2017, and 2020 were interpolated between 2011 and 2025. Then 2025 was projected out to 2030 emissions, using the yearly growth rate from 2011 to 2025.

2011 baseyear point source emissions were determined based on location within these specific localized areas in each county. Emissions were obtained through the Kentucky Emissions Inventory database.

Data Source: Kentucky Emissions Inventory database (2011)

POINT SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties			
		VOC Base Year 2011	VOC Attainment 2014	VOC Projected 2017	VOC Projected 2020	VOC Projected 2025	VOC Projected 2030
Facility ID	Facility Name	tpd	tpd	tpd	tpd	tpd	tpd
Campbell, KY							
2103700006	IPSCO Tubulars KY Inc	0.15	0.15	0.15	0.14	0.14	0.14
2103700090	Lafarge North America	0.08	0.08	0.07	0.07	0.07	0.07
	CAMPBELL COUNTY NON-EGU TOTAL	0.22	0.22	0.22	0.22	0.22	0.21
	CAMPBELL COUNTY EGU TOTAL	0.00	0.00	0.00	0.00	0.00	0.00
	CAMPBELL COUNTY AIR (AIRCRAFT)	0.00	0.00	0.00	0.00	0.00	0.00
	CAMPBELL COUNTY GRAND TOTAL	0.22	0.22	0.22	0.22	0.22	0.21

Point sources were divided into two categories: Non-EGU and EGU. Additionally, "Air" (Aircraft) emissions were provided by the Indiana Department of Environmental Management.

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Data Source : Kentucky Emissions Inventory database (2011)

POINT SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone Campbell, Kenton Counties			
		VOC Base Year 2011	VOC Attainment 2014	VOC Projected 2017	VOC Projected 2020	VOC Projected 2025	VOC Projected 2030
Facility ID	Facility Name	tpd	tpd	tpd	tpd	tpd	tpd
Kenton, KY							
2111700022	Marathon Petr Co LP - Covington Terminal	0.052670	0.05	0.05	0.05	0.05	0.05
2111700177	Firestone Building Products Co	0.460970	0.45	0.45	0.44	0.43	0.42
	KENTON COUNTY NON-EGU TOTAL	0.51	0.51	0.50	0.49	0.48	0.47
	KENTON COUNTY EGU TOTAL	0.00	0.00	0.00	0.00	0.00	0.00
	KENTON COUNTY AIR (AIRCRAFT)	0.00	0.00	0.00	0.00	0.00	0.00
	KENTON COUNTY GRAND TOTAL	0.51	0.51	0.50	0.49	0.48	0.47
	POINT SOURCE GRAND TOTAL	2.88	2.88	2.89	2.89	2.69	2.47

Point sources were divided into two categories: Non-EGU and EGU. Additionally, "Air" (Aircraft) emissions were provided by the Indiana Department of Environmental Management.

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Individual county growth rates were calculated based on EPA's 2011 NEI 2011-2025 point source emission projections. Once 2025 emissions were calculated using these growth rates, 2014, 2017, and 2020 were interpolated between 2011 and 2025. Then 2025 was projected out to 2030 emissions, using the yearly growth rate from 2011 to 2025.

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Data Source: Kentucky Emissions Inventory database (2011)

POINT SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties			
		NOx Base Year 2011	NOx Attainment 2014	NOx Projected 2017	NOx Projected 2020	NOx Projected 2025	NOx Projected 2030
Facility ID	Facility Name	tpd	tpd	tpd	tpd	tpd	tpd
Boone, KY							
2101500004	Aristech Acrylics LLC	0.01	0.01	0.02	0.02	0.02	0.02
2101500010	Greif Industrial Packaging & Services LLC	0.01	0.01	0.01	0.01	0.01	0.01
2101500018	DRS Environmental Systems Inc	0.01	0.01	0.01	0.01	0.01	0.01
2101500019	Duro Bag Manufacturing	0.00	0.00	0.00	0.00	0.00	0.00
2101500069	Camco Chemical Co	0.00	0.00	0.00	0.00	0.00	0.00
2101500077	Southern Graphic Systems Inc	0.00	0.00	0.00	0.00	0.00	0.00
2101500082	R R Donnelley - Nielsen Plant	0.00	0.00	0.00	0.00	0.00	0.00
2101500086	Duro Bag Mfg Co	0.01	0.01	0.01	0.01	0.01	0.01
2101500088	The Hennegan Co	0.00	0.00	0.00	0.00	0.00	0.00
2101500102	Sweco, Div of M-I, LLC	0.00	0.00	0.00	0.00	0.00	0.00
2101500114	Continental Web Press Inc	0.00	0.00	0.00	0.00	0.00	0.00
2101500120	Schwans Food Manufacturing Inc	0.09	0.09	0.09	0.10	0.10	0.10
2101500126	Keebler Foods Co	0.01	0.01	0.01	0.01	0.01	0.01
2101500142	Abrapower Inc	0.00	0.00	0.00	0.00	0.00	0.00
2101500144	Stonehouse Building Products LLC	0.00	0.00	0.00	0.00	0.00	0.00
2101500146	CW Zumbiel Packaging	0.01	0.01	0.01	0.01	0.01	0.01
	BOONE COUNTY NON-EGU TOTAL	**0.16**	**0.14**	**0.15**	**0.15**	**0.18**	**0.18**
2101500029	Duke Energy KY East Bend	7.04	7.23	7.46	7.71	7.96	8.33
	BOONE COUNTY EGU TOTAL	**7.04**	**7.23**	**7.46**	**7.71**	**7.96**	**8.33**
	BOONE COUNTY AIR (AIRCRAFT)	**2.03**	**2.07**	**2.18**	**2.29**	**1.29**	**0.29**
	BOONE COUNTY GRAND TOTAL	**9.22**	**9.44**	**9.79**	**10.15**	**9.42**	**8.80**

Point sources were divided into two categories: Non-EGU and EGU. Additionally, "Air" (Aircraft) emissions were provided by the Indiana Department of Environmental Management.

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Individual county growth rates were calculated based on EPA's 2011 NEI 2011-2025 point source emission projections. Once 2025 emissions were calculated using these growth rates, 2014, 2017, and 2020 were interpolated between 2011 and 2025. Then 2025 was projected out to 2030 emissions, using the yearly growth rate from 2011 to 2025.

2011 baseyear point source emissions were determined based on location within these specific localized areas in each county. Emissions were obtained through the Kentucky Emissions Inventory database.

Data Source: Kentucky Emissions Inventory database (2011)

POINT SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties			
		NOx Base Year 2011	NOx Attainment 2014	NOx Projected 2017	NOx Projected 2020	NOx Projected 2025	NOx Projected 2030
Facility ID	Facility Name	tpd	tpd	tpd	tpd	tpd	tpd
Campbell, KY							
2103700006	IPSCO Tubulars KY Inc	0.00	0.00	0.00	0.00	0.00	0.00
2103700090	Lafarge North America	0.17	0.17	0.17	0.17	0.17	0.17
	CAMPBELL COUNTY NON-EGU TOTAL	0.17	0.17	0.17	0.17	0.17	0.17
	CAMPBELL COUNTY EGU TOTAL	0.00	0.00	0.00	0.00	0.00	0.00
	CAMPBELL COUNTY AIR (AIRCRAFT)	0.00	0.00	0.00	0.00	0.00	0.00
	CAMPBELL COUNTY GRAND TOTAL	0.17	0.17	0.17	0.17	0.17	0.17

Point sources were divided into two categories: Non-EGU and EGU. Additionally, "Air" (Aircraft) emissions were provided by the Indiana Department of Environmental Management.

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Data Source : Kentucky Emissions Inventory database (2011)

POINT SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties			
		NOx Base Year	NOx Attainment	NOx Projected	NOx Projected	NOx Projected	NOx Projected
		2011	2014	2017	2020	2025	2030
Facility ID	Facility Name	tpd	tpd	tpd	tpd	tpd	tpd
Kenton, KY							
2111700022	Marathon Petr Co LP - Covington Terminal	0.004079	0.00	0.00	0.00	0.00	0.00
2111700177	Firestone Building Products Co	0.001561	0.00	0.00	0.00	0.00	0.00
	KENTON COUNTY NON-EGU TOTAL	0.01	0.01	0.01	0.01	0.01	0.01
	KENTON COUNTY EGU TOTAL	0.00	0.00	0.00	0.00	0.00	0.00
	KENTON COUNTY AIR (AIRCRAFT)	0.00	0.00	0.00	0.00	0.00	0.00
	KENTON COUNTY GRAND TOTAL	0.01	0.01	0.01	0.01	0.01	0.01
	POINT SOURCE GRAND TOTAL	9.40	9.62	9.97	10.33	9.60	8.98

Point sources were divided into two categories: Non-EGU and EGU. Additionally, "Air" (Aircraft) emissions were provided by the Indiana Department of Environmental Management.

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Individual county growth rates were calculated based on EPA's 2011 NEI 2011-2025 point source emission projections. Once 2025 emissions were calculated using these growth rates, 2014, 2017, and 2020 were interpolated between 2011 and 2025. Then 2025 was projected out to 2030 emissions, using the yearly growth rate from 2011 to 2025.

2011 baseyear point source emissions were determined based on location within these specific localized areas in each county. Emissions were obtained through the Kentucky Emissions Inventory database.

Data Source : Kentucky Emissions Inventory database (2011)

AREA SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone Campbell, Kenton Counties				
			VOC PORTION	VOC PORTION	VOC PORTION	VOC PORTION	VOC PORTION	VOC PORTION
			Base Year	Attainment	Projected	Projected	Projected	Projected
		Area	2011	2014	2017	2020	2025	2030
COUNTY		%	tpd	tpd	tpd	tpd	tpd	tpd
Boone		57%	2.66	2.56	2.46	2.41	2.38	2.36
Campbell		56%	1.29	1.26	1.23	1.22	1.21	1.19
Kenton		54%	2.51	2.43	2.35	2.31	2.28	2.25
AREA TOTAL			6.46	6.25	6.04	5.94	5.87	5.80

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton). The method to omit the six total Census Tracts mentioned was by using the measurement function in *Google Earth*. This approximated the percentage of each county that was determined to be in the designated nonattainment area.

Area source emissions were obtained from the Indiana Department of Environmental Management (IDEM) for ALL years. County portions were applied by multiplying the 2011 emissions for the entire county by the Area %. Emissions from the portions were then be projected out to Future Years.

Data Source : Indiana Department of Environmental Management, 2011-2030

AREA SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties				
			NOx PORTION Base Year	NOx PORTION Attainment	NOx PORTION Projected	NOx PORTION Projected	NOx PORTION Projected	NOx PORTION Projected
		Area	2011	2014	2017	2020	2025	2030
COUNTY		%	tpd	tpd	tpd	tpd	tpd	tpd
Boone		57%	0.43	0.43	0.43	0.43	0.44	0.44
Campbell		56%	0.49	0.49	0.49	0.49	0.49	0.49
Kenton		54%	1.02	1.02	1.02	1.02	1.02	1.02
AREA TOTAL			1.94	1.94	1.94	1.94	1.95	1.95

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Area source emissions were obtained from the Indiana Department of Environmental Management (IDEM) for ALL years. County portions were applied by multiplying the 2011 emissions for the entire county by the Area %. Emissions from the portions were then be projected out to Future Years.

Data Source : Indiana Department of Environmental Management, 2011-2030

HIGHWAY MOBILE SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)			AREA:	Boone, Campbell, Kenton Counties		
	VOC PORTION Base Year 2011	Population % (if applicable)	VOC PORTION Attainment 2014	VOC PORTION Interpolated 2017	VOC PORTION Projected 2020	VOC PORTION Interpolated 2025	VOC PORTION Projected 2030
COUNTY	tpd		tpd	tpd	tpd	tpd	tpd
Boone	3.30		2.53	1.96	1.38	1.08	0.77
Campbell	2.05		1.58	1.22	0.86	0.67	0.48
Kenton	3.12		2.39	1.85	1.30	1.02	0.73
HWY MOBILE	**8.47**		**6.50**	**5.03**	**3.54**	**2.77**	**1.99**

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton).

Andy Reser from the Ohio-Kentucky-Indiana Regional Council of Governments, or OKI, provided the highway mobile source emissions for 2011 baseyear, 2014 (attainment year), 2020, and 2030. KYDAQ interpolated emissions for the years 2017 and 2025. The emissions for the specific portions of each county were not calculated based on population percentages. Instead, the emissions were more accurately reflected by dividing the vehicle miles traveled in the portion by the vehicle miles traveled in the entire county.

Data Source : Andy Reser, "Ozone Mobile Source Emissions Inventory for the Cincinnati Ozone Nonattainment Area," Ohio-Kentucky-Indiana (OKI) Regional Council of Governments, Cincinnati, Ohio, August 2015, p. 6, Table 3.

HIGHWAY MOBILE SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)			AREA:	Boone, Campbell, Kenton Counties		
	NOx PORTION Base Year 2011	Population % (if applicable)	NOx PORTION Attainment 2014	NOx PORTION Interpolated 2017	NOx PORTION Projected 2020	NOx PORTION Interpolated 2025	NOx PORTION Projected 2030
COUNTY	tpd		tpd	tpd	tpd	tpd	tpd
Boone	6.90		5.46	3.94	2.41	1.73	1.05
Campbell	4.30		3.41	2.46	1.50	1.08	0.65
Kenton	6.53		5.17	3.73	2.28	1.64	0.99
HWY MOBILE	**17.72**		**14.04**	**10.13**	**6.20**	**4.45**	**2.69**

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton).

Andy Reser from the Ohio-Kentucky-Indiana Regional Council of Governments, or OKI, provided the highway mobile source emissions for 2011 baseyear, 2014 (attainment year), 2020, and 2030. KYDAQ interpolated emissions for the years 2017 and 2025. The emissions for the specific portions of each county were not calculated based on population percentages. Instead, the emissions were more accurately reflected by dividing the vehicle miles traveled in the portion by the vehicle miles traveled in the entire county.

Data Source : Andy Reser, "Ozone Mobile Source Emissions Inventory for the Cincinnati Ozone Nonattainment Area," Ohio-Kentucky-Indiana (OKI) Regional Council of Governments, Cincinnati, Ohio, August 2015, p. 6, Table 3.

NON-HIGHWAY MOBILE SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties				
			VOC PORTION Base Year	VOC PORTION Attainment	VOC PORTION Projected	VOC PORTION Projected	VOC PORTION Projected	VOC PORTION Projected
		Area	2011	2014	2017	2020	2025	2030
COUNTY		%	tpd	tpd	tpd	tpd	tpd	tpd
Boone		57%	1.49	1.30	1.12	1.03	0.97	0.92
Campbell		56%	0.40	0.34	0.28	0.25	0.24	0.22
Kenton		54%	0.62	0.55	0.48	0.47	0.48	0.50
NON-HWY TOTAL			2.51	2.19	1.88	1.75	1.69	1.64

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton). The method to omit the six total Census Tracts mentioned was by using the measurement function in *Google Earth*. This approximated the percentage of each county that was determined to be in the designated nonattainment area.

Non-highway source emissions were obtained from the Indiana Department of Environmental Management (IDEM) for ALL years. County portions were applied by multiplying the 2011 emissions for the entire county by the Area %. Emissions from the portions were then be projected out to Future Years.

Data Source : Indiana Department of Environmental Management, 2011-2030

NON-HIGHWAY MOBILE SOURCE EMISSIONS

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties				
			NOx PORTION Base Year	NOx PORTION Attainment	NOx PORTION Projected	NOx PORTION Projected	NOx PORTION Projected	NOx PORTION Projected
		Area	2011	2014	2017	2020	2025	2030
COUNTY		%	tpd	tpd	tpd	tpd	tpd	tpd
Boone		57%	1.06	0.88	0.70	0.60	0.49	0.38
Campbell		56%	0.38	0.32	0.26	0.23	0.19	0.15
Kenton		54%	0.77	0.64	0.51	0.43	0.35	0.27
NON-HWY TOTAL			2.21	1.84	1.47	1.26	1.03	0.80

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton). The method to omit the six total Census Tracts mentioned was by using the measurement function in *Google Earth*. This approximated the percentage of each county that was determined to be in the designated nonattainment area.

Non-highway source emissions were obtained from the Indiana Department of Environmental Management (IDEM) for ALL years. County portions were applied by multiplying the 2011 emissions for the entire county by the Area %. Emissions from the portions were then be projected out to Future Years.

Data Source : Indiana Department of Environmental Management, 2011-2030

TOTAL EMISSIONS SUMMARY

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties		
	VOC PORTION Base Year 2011	VOC PORTION Attainment 2014	VOC PORTION Projected 2017	VOC PORTION Projected 2020	VOC PORTION Projected 2025	VOC PORTION Projected 2030
COUNTY	tpd	tpd	tpd	tpd	tpd	tpd
Boone, KY						
Point	2.15	2.15	2.17	2.18	1.99	1.79
Area	2.66	2.56	2.46	2.41	2.38	2.36
Hwy Mobile	3.30	2.53	1.96	1.38	1.08	0.77
Non-Hwy	1.49	1.30	1.12	1.03	0.97	0.92
TOTAL	**9.60**	**8.54**	**7.71**	**7.00**	**6.42**	**5.84**
Campbell, KY						
Point	0.22	0.22	0.22	0.22	0.22	0.21
Area	1.29	1.26	1.23	1.22	1.21	1.19
Hwy Mobile	2.05	1.58	1.22	0.86	0.67	0.48
Non-Hwy	0.40	0.34	0.28	0.25	0.24	0.22
TOTAL	**3.96**	**3.40**	**2.95**	**2.55**	**2.34**	**2.10**
Kenton, KY						
Point	0.51	0.51	0.50	0.49	0.48	0.47
Area	2.51	2.43	2.35	2.31	2.28	2.25
Hwy Mobile	3.12	2.39	1.85	1.30	1.02	0.73
Non-Hwy	0.62	0.55	0.48	0.47	0.48	0.50
TOTAL	**6.76**	**5.88**	**5.18**	**4.57**	**4.26**	**3.95**
AREA TOTAL	**20.32**	**17.82**	**15.84**	**14.12**	**13.02**	**11.90**

TOTAL EMISSIONS SUMMARY

POLLUTANT(S):	O3 (VOC, NOx)		AREA:	Boone, Campbell, Kenton Counties		
	NOx PORTION Base Year 2011	NOx PORTION Attainment 2014	NOx PORTION Projected 2017	NOx PORTION Projected 2020	NOx PORTION Projected 2025	NOx PORTION Projected 2030
COUNTY	tpd	tpd	tpd	tpd	tpd	tpd
Boone, KY						
Point	9.22	9.44	9.79	10.15	9.42	8.80
Area	0.43	0.43	0.43	0.43	0.44	0.44
Hwy Mobile	6.90	5.46	3.94	2.41	1.73	1.05
Non-Hwy	1.06	0.88	0.70	0.60	0.49	0.38
TOTAL	**17.61**	**16.21**	**14.86**	**13.59**	**12.08**	**10.67**
Campbell, KY						
Point	0.17	0.17	0.17	0.17	0.17	0.17
Area	0.49	0.49	0.49	0.49	0.49	0.49
Hwy Mobile	4.30	3.41	2.46	1.50	1.08	0.65
Non-Hwy	0.38	0.32	0.26	0.23	0.19	0.15
TOTAL	**5.34**	**4.39**	**3.38**	**2.39**	**1.93**	**1.46**
Kenton, KY						
Point	0.01	0.01	0.01	0.01	0.01	0.01
Area	1.02	1.02	1.02	1.02	1.02	1.02
Hwy Mobile	6.53	5.17	3.73	2.28	1.64	0.99
Non-Hwy	0.77	0.64	0.51	0.43	0.35	0.27
TOTAL	**8.33**	**6.84**	**5.27**	**3.74**	**3.02**	**2.29**
AREA TOTAL	**31.27**	**27.44**	**23.51**	**19.73**	**17.03**	**14.42**

IMPORTANT NOTES:

For this ozone redesignation request, each county has two Census Tracts NOT included in the Population Growth calculations: 706.01 and 706.04 (Boone), 520.01 and 520.02 (Campbell), 637.01 and 637.02 (Kenton).). The method to omit the six total Census Tracts mentioned was by using the measurement function in *Google Earth*. This approximated the percentage of each county that was determined to be in the designated nonattainment area. This Area % was applied to Area and Non-Highway emission sources.

Individual county growth rates were averaged to represent the growth rate that was used to project emissions in the future. The average growth rate was used since it better represents the overall growth for the three-county region.

2011 baseyear emissions were obtained from a variety of sources. Point source emissions were obtained from state emissions inventory databases. 2011 baseyear area and non-highway mobile source emissions were obtained from the National Emissions Inventory (U.S. EPA). Highway mobile source emissions were obtained from the Ohio-Kentucky-Indiana Regional Council of Governments, or OKI, in Cincinnati, Ohio. KYDAQ interpolated the highway mobile source emissions for the years 2017 and 2025. Growth rates in the "Pop Growth" worksheet, shaded in gray, were then applied to project the Future Year O_3 emissions for 2014 (attainment year), 2017, 2020, 2025, and 2030. Where applicable (area and non-highway), county portions were applied by multiplying the 2011 baseyear emissions for the entire county by the Area %. Emissions from the portions were then be projected out to Future Years.

NKY REDESIGNATION REQUEST: MOBILE SOURCE SAFETY MARGIN CALCULATIONS - VOC

2020 VOC	Boone	Step 1		8.54	-	7.00	=	1.54	x	0.15	=	**0.23**
		Step 2		1.38	+	0.23	=					**1.61**
	Campbell	Step 1		3.40	-	2.55	=	0.85	x	0.15	=	**0.13**
		Step 2		0.86	+	0.13	=					**0.99**
	Kenton	Step 1		5.88	-	4.57	=	1.31	x	0.15	=	**0.20**
		Step 2		1.30	+	0.20	=					**1.50**
											Total VOC Safety Margin for 2020:	**0.56**
											Total VOC Budget with Safety Margin for 2020:	**4.10**
2030 VOC	Boone	Step 1		8.54	-	5.84	=	2.70	x	0.15	=	**0.41**
		Step 2		0.77	+	0.41	=					**1.18**
	Campbell	Step 1		3.40	-	2.10	=	1.30	x	0.15	=	**0.20**
		Step 2		0.48	+	0.20	=					**0.68**
	Kenton	Step 1		5.88	-	3.95	=	1.93	x	0.15	=	**0.29**
		Step 2		0.73	+	0.29	=					**1.02**
											Total VOC Safety Margin for 2030:	**0.89**
											Total VOC Budget with Safety Margin for 2030:	**2.87**

-- May 2016
Revised December 2016

NKY REDESIGNATION REQUEST: MOBILE SOURCE SAFETY MARGIN CALCULATIONS - NOx

2020 NOx	Boone	Step 1		16.21	-	13.59	=	2.62	x	0.15	=	**0.39**
		Step 2		2.41	+	0.39	=					**2.80**
	Campbell	Step 1		4.39	-	2.39	=	2.00	x	0.15	=	**0.30**
		Step 2		1.50	+	0.30	=					**1.80**
	Kenton	Step 1		6.84	-	3.74	=	3.10	x	0.15	=	**0.47**
		Step 2		2.28	+	0.47	=					**2.75**
											Total NOx Safety Margin for 2020:	**1.16**
											Total NOx Budget with Safety Margin for 2020:	**7.35**
2030 NOx	Boone	Step 1		16.21	-	10.67	=	5.54	x	0.15	=	**0.83**
		Step 2		1.05	+	0.83	=					**1.88**
	Campbell	Step 1		4.39	-	1.46	=	2.93	x	0.15	=	**0.44**
		Step 2		0.65	+	0.44	=					**1.09**
	Kenton	Step 1		6.84	-	2.29	=	4.55	x	0.15	=	**0.68**
		Step 2		0.99	+	0.68	=					**1.67**
											Total NOx Safety Margin for 2030:	**1.95**
											Total NOx Budget with Safety Margin for 2030:	**4.64**