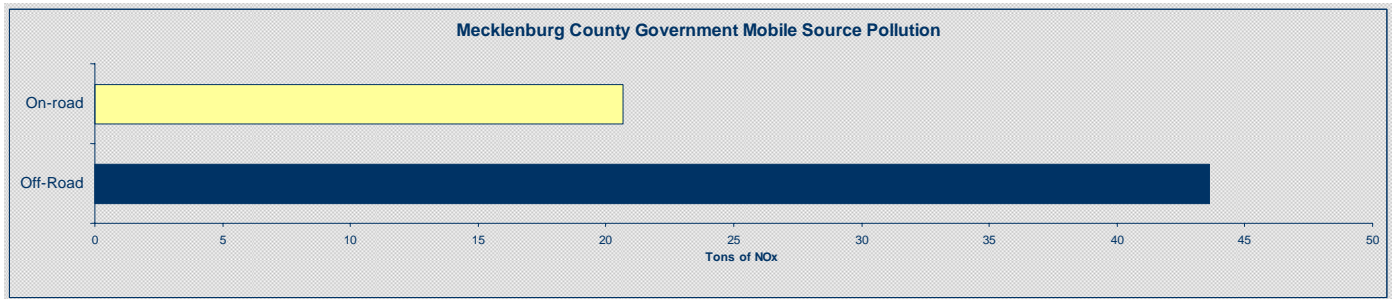


Mecklenburg County, NC Government's 2006 Off-Road Equipment Inventory



Off Road Equipment County's Greatest Source of NOx Pollution Emits Twice the Amount of Air Pollution as the County's Fleet of Highway Vehicles

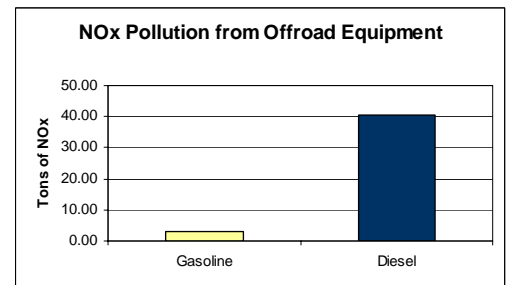
For the first time, Mecklenburg County government has compiled a list of all of its off-road equipment and calculated the impact of its use on our air quality. In 2006, this equipment including gasoline and diesel engines such as lawn/garden, construction and industrial equipment produced 44 tons of Nitrogen Oxide (NOx) air pollution and 4.5 tons of particulate matter (PM10) pollution. That amount of pollution is the equivalent of almost 20,000 car trips across the United States.

All off-road equipment owned and operated by Mecklenburg County government was included in this inventory regardless of size, fuel type or use. Reports from Department Directors revealed that the County owns and operates 304 pieces of off-road equipment. Of that, over half is gasoline powered. These 304 pieces of equipment produced twice as much NOx as did the County's 1,138 car fleet.

92% of Off-road Nitrogen Oxide Pollution from Diesel Equipment

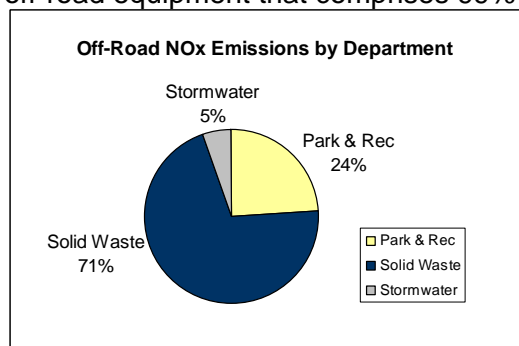
Despite the fact that most of the equipment is gasoline-powered, most of the air pollution is generated by the diesel equipment. In fact, further analysis revealed that 70% of the nitrogen oxide pollution and 45% of the PM10 pollution is generated by only 22 of the over 300 pieces of equipment.

This is a useful fact to know because it highlights the specific equipment to focus on when developing a plan to reduce the impact of the County's off-road sources.



Equipment Operated by Three County Departments

When analyzed by Department, Solid Waste, Park and Recreation and Stormwater Services operate the off-road equipment that comprises 99% of the County's off-road NOx emissions. In particular, the equipment used by Solid Waste generates over 70% of the NOx. There are a handful of pieces reported by the Sheriff's Office, and the Health Department.



All three of the Departments that operate the majority of the County's off-road equipment have begun taking the steps necessary to make sure that future purchases result in cleaner equipment. Future versions of this inventory will demonstrate progress made by these decisions. In addition to purchasing cleaner equipment, there are also opportunities for upgrading existing equipment to make it cleaner throughout the lifetime of

its use. These opportunities will be presented to the Environmental Leadership team for consideration.

The 2006 off-road inventory demonstrates that there are certainly opportunities for improving air quality by addressing County-owned and operated equipment.

Inventory and Action: Part of Mecklenburg County's Commitment to Leadership

Through its Environmental Leadership Policy signed on February 17, 2004, Mecklenburg County has committed to become a model of environmental stewardship for local governments, business and industry in our region. In doing so, staff has been looking closely at various County operational practices, purchasing policies, and design standards to determine what changes can be made in order to improve the quality of land, water and air in Mecklenburg County. There have been discussions about the waste we generate, the cars we drive, the buildings we construct and the energy that we consume while serving our customers.

One frequently forgotten, yet significant, contributor to air pollution in Mecklenburg County is off-road equipment. This includes gasoline and diesel engines such as lawn/garden, construction and industrial equipment. This report represents the first effort by Mecklenburg County government to compile a list of all of its off-road equipment and calculate the impact of its use on our air quality. This information will be used to make decisions about future efforts to "clean up" or replace key groups of equipment. When repeated annually, the inventory will serve as a report card by which the County can measure improvement in the equipment over time.

Appendix A
 2006 Emission Inventory
 Equipment Sorted by Highest NOx Emissions

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
SWZ933 GRINDER	2005	Diesel	12865	818	Solid Waste	10,513.54	432.80	143.94
SWZ913 GRINDER		Diesel	10740	702	Solid Waste	5,164.10	212.95	120.16
SWL213 LOADER	2000	Diesel	2023	1801	Solid Waste	4,590.84	392.08	22.63
Compactor	2004	Diesel	12530	1200	Solid Waste/Foxhole	4,131.75	160.85	140.19
SWZ931 GRINDER	2001	Diesel	4736	464	Solid Waste	3,952.59	193.33	52.99
Compactor	2001	Diesel	9180	750	Solid Waste/Foxhole	3,058.04	119.05	102.71
SWL211 LOADER	1997	Diesel	3334	1134	Solid Waste	2,890.63	246.88	37.30
Dozer	2004	Diesel	6349	1337	Solid Waste/Foxhole	2,882.15	121.67	71.03
Dozer /	1984	Diesel	0	1880	Stormwater	2,831.60	246.60	0.00
SWL212 LOADER		Diesel	591	993	Solid Waste	2,551.46	217.91	6.61
214 - Fox Hole - Wheel Loader	2002	Diesel	2040	953	Solid Waste	2,448.68	209.13	22.82
SWL208 LOADER	2003	Diesel	3531	1688	Solid Waste	2,270.76	180.86	39.51
SWL209 LOADER	2003	Diesel	3513	1624	Solid Waste	2,184.67	174.00	39.30
SWT503 EXCAVATOR	2005	Diesel	1338	1705	Solid Waste	2,143.88	121.56	14.97
SWL215 LOADER	2005	Diesel	2382	1403	Solid Waste	2,083.10	165.91	26.65
217 - North Meck - Wheel Loader	2003	Diesel	1899	1370	Solid Waste	1,723.83	321.66	21.25
Off-Road Truck	1999	Diesel	1279	466	Solid Waste/Foxhole	1,383.21	81.21	14.31
SWL210 LOADER	2003	Diesel	3100	991	Solid Waste	1,333.13	106.18	34.68
Dozer	2003	Diesel	2869	842	Solid Waste/Foxhole	1,224.39	69.42	32.10
CHIPPER/8103	1991	Diesel	200	800	Park and Recreation	1,034.39	107.94	2.24
Tractors, Backhoe, Skidsteers/6066	1992	Diesel	275	800	Park and Recreation	1,006.61	187.83	3.08
527 - Hickory Grove - Back Hoe	2006	Diesel	1599	969	Solid Waste	953.49	86.35	17.89
Tractors, Backhoe, Skidsteers/6063	1997	Diesel	275	800	Park and Recreation	872.40	162.79	3.08
Tractors, Backhoe, Skidsteers/	2005	Diesel	275	800	Park and Recreation	869.58	78.75	3.08
Utility Vehicle/6155	2000	Gasoline	375	1500	Park & Rec	864.19	6.15	3.64
Tractors, Backhoe, Skidsteers/6051		Diesel	275	800	Park and Recreation	845.56	157.78	3.08
SWZ932 SCREENER	2005	Diesel	953	479	Solid Waste	696.54	39.49	10.66
Tractors, Backhoe, Skidsteers/6132		Diesel	165	500	Park and Recreation	696.24	129.92	1.85
525 - West Blvd - Wheel Loader	2003	Diesel	166	543	Solid Waste	683.24	127.49	1.86

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
SWT502 EXCAVATOR	2004	Diesel	1255	537	Solid Waste	666.04	37.77	14.04
Backhoe loader	2003	Diesel	0	514	Stormwater	655.37	122.29	0.00
Tractors, Backhoe, Skidsteers/6100	2000	Diesel	165	500	Park and Recreation	654.30	122.09	1.85
Utility Vehicle/6003	1992	Gasoline	250	1000	Park & Rec	576.12	4.10	2.43
522 - North Meck - Wheel Loader	2007	Diesel	994	672	Solid Waste	574.58	98.61	11.12
Dozer /	2002	Diesel	0	528	Stormwater	563.34	76.66	0.00
Tractors, Backhoe, Skidsteers/6160	2005	Diesel	250	750	Park and Recreation	540.63	48.96	2.80
Tractors, Backhoe, Skidsteers/6074	1997	Diesel	133	400	Park and Recreation	536.86	100.18	1.49
Tractors, Backhoe, Skidsteers/6099	2000	Diesel	165	500	Park and Recreation	528.47	98.61	1.85
Excavator	2007	Diesel	1422	403	Solid Waste/Foxhole	426.67	35.96	15.91
MISC/6095	1998	Gasoline	50	200	Park & Rec	401.43	2.86	0.49
160 Excavator / POO160X040721	2006	Diesel	0	480	Stormwater	400.26	26.08	0.00
Tractors, Backhoe, Skidsteers/6039	1988	Diesel	165	500	Park and Recreation	377.48	78.37	1.85
Tractors, Backhoe, Skidsteers/	2006	Diesel	133	400	Park and Recreation	343.25	31.08	1.49
524 - Hickory Grove - Back Hoe	2000	Diesel	750	650	Solid Waste	321.65	41.28	8.39
Tractors, Backhoe, Skidsteers/6049		Diesel	133	400	Park and Recreation	315.41	65.49	1.49
Tractors, Backhoe, Skidsteers/6068		Diesel	133	400	Park and Recreation	315.41	65.49	1.49
Utility Vehicle/	1993	Gasoline	125	500	Park & Rec	288.06	2.05	1.21
Tractors, Backhoe, Skidsteers/6079	2000	Diesel	250	750	Park and Recreation	276.19	35.45	2.80
Menzi Muck / 1318498	1985	Diesel	0	224	Stormwater	271.73	29.33	0.00
Tractors, Backhoe, Skidsteers/6086	2000	Diesel	65	200	Park and Recreation	251.65	46.96	0.73
Tractors, Backhoe, Skidsteers/6087	2000	Diesel	65	200	Park and Recreation	251.65	46.96	0.73
Utility Vehicle/6035	1995	Gasoline	100	400	Park & Rec	230.45	1.64	0.97
Utility Vehicle/6105	2002	Gasoline	100	400	Park & Rec	230.45	1.64	0.97
Tractors, Backhoe, Skidsteers/	1998	Diesel	133	400	Park and Recreation	214.74	44.59	1.49
Tractors, Backhoe, Skidsteers/		Diesel	65	200	Park and Recreation	208.03	38.82	0.73
BOBCAT	1997	Diesel	667	312	Solid Waste	206.93	31.01	7.46
Mowers/6137	2003	Gasoline	100	400	Park & Rec	200.71	1.43	0.97
Tractors, Backhoe, Skidsteers/6073		Diesel	80	250	Park and Recreation	197.13	40.93	0.90

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
Tractors, Backhoe, Skidsteers/6012	1991	Diesel	133	400	Park and Recreation	194.38	36.89	1.49
Tractors, Backhoe, Skidsteers/	2006	Diesel	250	750	Park and Recreation	186.34	20.16	2.80
Utility Vehicle/6171	2003	Gasoline	375	1500	Park & Rec	178.57	2.38	3.64
Utility Vehicle/6173	2003	Gasoline	375	1500	Park & Rec	178.57	2.38	3.64
Tractors, Backhoe, Skidsteers/6047	1986	Diesel	133	400	Park and Recreation	177.84	36.92	1.49
Tractors, Backhoe, Skidsteers/6042		Diesel	165	500	Park and Recreation	175.77	33.36	1.85
Utility Vehicle/6057	1998	Diesel	100	400	Park and Recreation	173.70	32.96	1.12
Tractors, Backhoe, Skidsteers/		Diesel	65	200	Park and Recreation	167.77	31.31	0.73
Tractors, Backhoe, Skidsteers/6054	1996	Diesel	65	200	Park and Recreation	167.77	31.31	0.73
Tractors, Backhoe, Skidsteers/6067	1996	Diesel	65	200	Park and Recreation	167.77	31.31	0.73
Tractors, Backhoe, Skidsteers/	1997	Diesel	65	200	Park and Recreation	167.77	31.31	0.73
Tractors, Backhoe, Skidsteers/		Diesel	65	200	Park and Recreation	157.70	32.74	0.73
Tractors, Backhoe, Skidsteers/	1991	Diesel	65	200	Park and Recreation	157.70	32.74	0.73
Tractors, Backhoe, Skidsteers/6058		Diesel	65	200	Park and Recreation	157.70	32.74	0.73
BOBCAT	2002	Diesel	738	345	Solid Waste	156.74	14.69	8.26
Tractors, Backhoe, Skidsteers/6053	1995	Diesel	65	200	Park and Recreation	150.99	31.35	0.73
Tractors, Backhoe, Skidsteers/6078	2001	Diesel	133	400	Park and Recreation	147.30	18.91	1.49
Off-Road Truck	2007	Diesel	203	85	Solid Waste/Foxhole	139.39	11.75	2.27
Tractors, Backhoe, Skidsteers/6048		Diesel	60	175	Park and Recreation	137.99	28.65	0.67
sandpro/6146	2000	Gasoline	188	750	Park & Rec	133.93	1.79	1.83
sandpro/7093	2003	Gasoline	188	750	Park & Rec	133.93	1.79	1.83
HYDROSEDED/7052	2000	Gasoline	125	500	Park & Rec	124.01	1.65	1.21
CHIPPER/7067	2000	Gasoline	125	500	Park & Rec	124.01	1.65	1.21
Utility Vehicle/6001	1995	Gasoline	50	200	Park & Rec	115.22	0.82	0.49
Utility Vehicle/9956	1999	Gasoline	50	200	Park & Rec	115.22	0.82	0.49
Utility Vehicle/6136	2002	Gasoline	50	200	Park & Rec	115.22	0.82	0.49
STRAWBLOWER		Diesel	13	52	Park and Recreation	110.48	5.27	0.15
Tractors, Backhoe, Skidsteers/6027	1986	Diesel	80	250	Park and Recreation	104.86	21.77	0.90
Utility Vehicle/6101	1998	Gasoline	250	1000	Park & Rec	99.21	1.32	2.43

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
Tractors, Backhoe, Skidsteers/6116	1996	Diesel	65	200	Park and Recreation	93.95	19.51	0.73
Utility Vehicle/#67997	2006	Gasoline	188	750	Park & Rec	91.60	1.98	1.83
Utility Vehicle/6046	1999	Gasoline	40	150	Park & Rec	86.42	0.62	0.39
Utility Vehicle/6064	1999	Gasoline	40	150	Park & Rec	86.42	0.62	0.39
Mowers/6060	1998	Diesel	50	200	Park and Recreation	86.20	9.13	0.56
Tractors, Backhoe, Skidsteers/	2000	Diesel	65	200	Park and Recreation	85.16	10.93	0.73
Utility Vehicle/6149	2004	Gasoline	250	1000	Park & Rec	79.39	1.72	2.43
Mowers/6138	2003	Gasoline	100	400	Park & Rec	79.37	1.06	0.97
Tractors, Backhoe, Skidsteers/9997	1995	Diesel	33	100	Park and Recreation	76.50	15.88	0.37
Mowers/6045	1995	Diesel	50	200	Park and Recreation	76.06	8.82	0.56
Mowers/6020	1997	Diesel	50	200	Park and Recreation	76.06	8.82	0.56
Mowers/6055	1998	Diesel	50	200	Park and Recreation	76.06	8.82	0.56
Mowers/6108	1999	Diesel	50	200	Park and Recreation	76.06	8.82	0.56
Mowers/6125	1999	Diesel	50	200	Park and Recreation	76.06	8.82	0.56
Tractors, Backhoe, Skidsteers/6076	2001	Diesel	65	200	Park and Recreation	75.95	9.75	0.73
Tractors, Backhoe, Skidsteers/	2004	Diesel	65	200	Park and Recreation	75.95	9.75	0.73
Utility Vehicle/6117	2003	Diesel	80	320	Park and Recreation	72.59	7.85	0.90
Utility Vehicle/	2006	Gasoline	125	500	Park & Rec	72.24	36.22	1.21
Tractors, Backhoe, Skidsteers/6025	1984	Diesel	33	100	Park and Recreation	67.11	13.93	0.37
/7082	2002	Gasoline	25	100	Park & Rec	65.05	0.46	0.24
Utility Vehicle/	2004	Gasoline	125	500	Park & Rec	61.07	1.32	1.21
Utility Vehicle/	2005	Gasoline	188	750	Park & Rec	59.54	1.29	1.83
Utility Vehicle/	2005	Gasoline	188	750	Park & Rec	59.54	1.29	1.83
Utility Vehicle/6189	2006	Gasoline	188	750	Park & Rec	59.54	1.29	1.83
Utility Vehicle/	2006	Gasoline	188	750	Park & Rec	59.54	1.29	1.83
Utility Vehicle/6142	2004	Gasoline	100	400	Park & Rec	57.79	56.31	0.97
Utility Vehicle/6143	2004	Gasoline	100	400	Park & Rec	57.79	83.65	0.97
Tractors, Backhoe, Skidsteers/6069		Diesel	13	40	Park and Recreation	57.71	10.77	0.15
Mowers/6032	1991	Diesel	38	150	Park and Recreation	57.04	6.61	0.43

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
sandpro/6147	2004	Gasoline	125	500	Park & Rec	54.96	1.19	1.21
Mowers/7158	2005	Diesel	50	200	Park and Recreation	54.22	3.90	0.56
Mowers/6061	2000	Diesel	50	200	Park and Recreation	52.14	3.75	0.56
	1994	Gasoline	50	100	Park & Rec	51.70	84.88	0.49
/	1994	Gasoline	50	100	Park & Rec	51.70	84.88	0.49
/	1994	Gasoline	50	100	Park & Rec	51.70	84.88	0.49
Tractors, Backhoe, Skidsteers/6097	1995	Diesel	13	40	Park and Recreation	51.67	9.64	0.15
Tractors, Backhoe, Skidsteers/6091	2000	Diesel	13	40	Park and Recreation	50.33	9.39	0.15
LEAF VAC/7101	1998	Gasoline	50	200	Park & Rec	49.60	0.66	0.49
Utility Vehicle/	2001	Gasoline	125	500	Park & Rec	49.60	0.66	1.21
Utility Vehicle/6165	2006	Gasoline	125	500	Park & Rec	48.85	1.06	1.21
sandpro/6107		Gasoline	65	250	Park & Rec	44.64	0.60	0.63
sandpro/	1996	Gasoline	125	500	Park & Rec	40.87	1.19	1.21
Utility Vehicle/6077	2000	Gasoline	100	400	Park & Rec	39.68	0.53	0.97
Mowers/6106	2001	Gasoline	50	200	Park & Rec	39.68	0.53	0.49
Tractors, Backhoe, Skidsteers/6052	1986	Diesel	15	50	Park and Recreation	39.43	8.19	0.17
LEAF VAC/7090	2002	Diesel	50	200	Park and Recreation	39.15	2.38	0.56
/	2004	Gasoline	100	400	Park & Rec	39.08	0.85	0.97
GRINDER 630B		Diesel	25	100	Park and Recreation	36.50	2.62	0.28
9 Blowers		Mix	900	4500	Park & Rec	36.11	305.56	8.74
Utility Vehicle/	2004	Gasoline	125	500	Park & Rec	30.53	0.66	1.21
Tractors, Backhoe, Skidsteers/6092		Diesel	13	40	Park and Recreation	30.20	6.27	0.15
Mowers/6081		Gasoline	38	150	Park & Rec	29.76	0.40	0.37
Utility Vehicle/#67970	2006	Gasoline	100	400	Park & Rec	29.31	0.63	0.97
7 Blowers		Mix	700	3500	Park & Rec	28.09	237.65	6.80
CHIPPER/9860	1988	Gasoline	12	50	Park & Rec	27.88	0.20	0.12
/7022	1998	Gasoline	12	50	Park & Rec	27.88	0.20	0.12
ROLLER/7025	1998	Gasoline	12	50	Park & Rec	27.88	0.20	0.12
HYDROSEEDER	1997	Diesel	13	52	Park and Recreation	26.50	3.07	0.15

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
Tractors, Backhoe, Skidsteers/6098	1991	Diesel	10	30	Park and Recreation	25.17	4.70	0.11
Utility Vehicle/6079	1999	Gasoline	60	250	Park & Rec	24.80	0.33	0.58
Gradall - Rear	1978	Diesel	30	20	Solid Waste/Foxhole	24.07	2.04	0.34
Utility Vehicle/6134	2004	Gasoline	75	300	Park & Rec	23.82	0.52	0.73
Utility Vehicle/6034	2004	Gasoline	60	250	Park & Rec	22.90	0.50	0.58
CHIPPER/8101	1988	Gasoline	50	200	Park & Rec	22.71	0.66	0.49
Utility Vehicle/6096	2000	Diesel	25	100	Park and Recreation	22.69	2.45	0.28
Tractors, Backhoe, Skidsteers/6028	1996	Diesel	13	40	Park and Recreation	22.15	4.60	0.15
Grader	1997	Diesel	54	20	Solid Waste/Foxhole	21.92	2.98	0.60
5 Blowers		Mix	500	2500	Park & Rec	20.06	169.75	4.86
Mowers/6043	1996	Diesel	13	52	Park and Recreation	19.78	2.29	0.15
Mowers/6080		Diesel	12	50	Park and Recreation	19.01	2.20	0.13
Mowers/6019	1997	Diesel	12	50	Park and Recreation	19.01	2.20	0.13
Mowers/6021	1997	Diesel	12	50	Park and Recreation	19.01	2.20	0.13
Mowers/6128	1999	Diesel	12	50	Park and Recreation	19.01	2.20	0.13
Utility Vehicle/6056	1999	Gasoline	25	100	Park & Rec	18.85	0.25	0.24
Mowers/6089		Gasoline	38	150	Park & Rec	18.18	0.52	0.37
Tractors, Backhoe, Skidsteers/6024	1994	Diesel	13	40	Park and Recreation	16.54	3.14	0.15
DTCH WTCH	1997	Diesel	7	30	Park and Recreation	15.97	1.85	0.08
Mowers/	1996	Gasoline	50	200	Park & Rec	14.53	0.42	0.49
Tractors, Backhoe, Skidsteers/		Diesel	10	30	Park and Recreation	14.27	2.71	0.11
Tractor	2002	Diesel	20	38	Solid Waste/Foxhole	13.99	1.80	0.22
MILLER / WELDER	2006	Gasoline	50	100	Solid Waste	13.43	0.29	0.49
Mowers/6124		Gasoline	13	52	Park & Rec	12.90	0.17	0.13
Utility Vehicle/	2004	Gasoline	50	200	Park & Rec	12.21	0.26	0.49
JOHN DEER	2007	Diesel	49	22	Solid Waste	12.09	0.79	0.55
6 Blowers		Mix	300	1500	Park & Rec	12.04	101.85	2.91
5 Blowers		Mix	300	1500	Park & Rec	12.04	101.85	2.91
Pressure Washer	2006	Gasoline	30	300	Keith Corp	11.90	0.20	0.29

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
Rubber Tired Loader	1992	Diesel	30	15	Solid Waste/Foxhole	11.25	1.53	0.34
Rubber Tired Backhoe	1996	Diesel	20	10	Solid Waste/Foxhole	11.25	1.53	0.22
Mowers/6082		Gasoline	12	50	Park & Rec	9.92	0.13	0.12
Tractors, Backhoe, Skidsteers/9914	1991	Diesel	6	20	Park and Recreation	9.72	1.84	0.07
4x4 Utility Vehicle	2006	Diesel	15	30	Solid Waste/Foxhole	9.67	1.24	0.17
8 Blowers		Mix	240	1200	Park & Rec	9.63	81.48	2.33
Mowers/		Gasoline	12	50	Park & Rec	8.93	0.12	0.12
ALERT Trailer	2005	Diesel	25	100	Sheriff	8.36	1.75	0.28
2 Blowers		Mix	200	1000	Park & Rec	8.02	67.90	1.94
3 Blowers		Mix	200	1000	Park & Rec	8.02	67.90	1.94
Mowers/6072	2000	Gasoline	12	50	Park & Rec	7.94	0.11	0.12
Mowers/	2006	Gasoline	12	50	Park & Rec	6.29	0.18	0.12
Mowers/		Gasoline	12	50	Park & Rec	6.11	0.13	0.12
Gradall - Front	1978	Diesel	40	2	Solid Waste/Foxhole	5.62	0.48	0.45
Mowers/	2006	Gasoline	12	50	Park & Rec	5.19	0.11	0.12
Mowers/	2004	Gasoline	10	40	Park & Rec	4.89	0.11	0.10
ATV/6085	2001	Gasoline	58	230	Park & Rec	4.16	0.61	0.56
Mowers/6083		Gasoline	10	40	Park & Rec	3.63	0.11	0.10
ATV/6030	1996	Gasoline	50	200	Park & Rec	3.62	0.53	0.49
ATV/6140	2000	Gasoline	50	200	Park & Rec	3.62	0.53	0.49
ATV/6110		Gasoline	50	200	Park & Rec	3.62	0.53	0.49
4 Trimmers		Mix	100	500	Park & Rec	3.28	16.98	0.97
8 Trimmers		Mix	100	500	Park & Rec	3.28	16.98	0.97
9 Trimmers		Mix	90	450	Park & Rec	2.96	15.28	0.87
6 Brushcutter		Mix	80	400	Park & Rec	2.63	13.58	0.78
13 Blowers		Mix	1300	260	Park & Rec	2.09	17.65	12.62
2 Generators		Gasoline	50	250	Park & Rec	2.01	16.98	0.49
1 Line Painter		Mix	50	250	Park & Rec	2.01	16.98	0.49
9 Blowers		Mix	48	240	Park & Rec	1.93	16.30	0.47

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
SERT Trailer	2003	Gasoline	20	80	Sheriff	1.93	8.15	0.19
ATV/6006	1996	Gasoline	25	100	Park & Rec	1.81	0.26	0.24
ATV/6008	1996	Gasoline	25	100	Park & Rec	1.81	0.26	0.24
ATV/6029	1996	Gasoline	25	100	Park & Rec	1.81	0.26	0.24
1 Tiller		Mix	40	210	Park & Rec	1.69	14.26	0.39
5 Trimmers		Mix	50	250	Park & Rec	1.64	8.49	0.49
3 Chainsaws		Mix	50	250	Park & Rec	1.64	8.49	0.49
1 Blower pull		Gasoline	40	200	Park & Rec	1.60	13.58	0.39
1 Tiller		Mix	40	200	Park & Rec	1.60	13.58	0.39
4 Trimmers		Mix	40	200	Park & Rec	1.31	6.79	0.39
5 Chainsaws		Mix	40	200	Park & Rec	1.31	6.79	0.39
4 Polesaw		Mix	40	200	Park & Rec	1.31	6.79	0.39
3 Blowers		Mix	30	150	Park & Rec	1.20	10.19	0.29
3 Blowers		Mix	30	150	Park & Rec	1.20	10.19	0.29
6 Trimmers		Mix	36	180	Park & Rec	1.18	6.11	0.35
AIR COMPRESSER	2004	Gasoline	12.5	25	Solid Waste	1.09	0.02	0.12
PRESSURE WASHER	2005	Gasoline	26	52	Solid Waste	1.04	4.41	0.25
3 Polesaw		Mix	30	150	Park & Rec	0.99	5.09	0.29
3 Chainsaws		Mix	30	150	Park & Rec	0.99	5.09	0.29
3 Chainsaws		Mix	30	150	Park & Rec	0.99	5.09	0.29
ATV/7092		Gasoline	12	50	Park & Rec	0.90	0.13	0.12
VACUM	2005	Gasoline	26	52	Solid Waste	0.83	3.53	0.25
1 Blower push type		Gasoline	20	100	Park & Rec	0.80	6.79	0.19
2 Line Painter		Mix	20	100	Park & Rec	0.80	6.79	0.19
2 Blower		Mix	20	100	Park & Rec	0.80	6.79	0.19
ATV/7114		Gasoline	10	40	Park & Rec	0.72	0.11	0.10
8 Trimmers		Mix	20	100	Park & Rec	0.66	3.40	0.19
3 Trimmers		Mix	20	100	Park & Rec	0.66	3.40	0.19
4 Chainsaws		Mix	20	100	Park & Rec	0.66	3.40	0.19

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
4 Trimmers		Mix	20	100	Park & Rec	0.66	3.40	0.19
2 Trimmers		Mix	20	100	Park & Rec	0.66	3.40	0.19
PRESSURE WASHER	2004	Gasoline	12.5	25	Solid Waste	0.55	2.33	0.12
ATV/6007	1996	Gasoline	7	30	Park & Rec	0.54	0.08	0.07
Leaf Blower	2006	Gasoline	10	75	Keith Corp	0.49	2.55	0.10
4 Chainsaws		Mix	15	70	Park & Rec	0.46	2.38	0.15
WATER PUMP	2000	Gasoline	5	10	Solid Waste	0.44	0.01	0.05
1 Auger		Mix	10	50	Park & Rec	0.40	3.40	0.10
1 Line Painter		Mix	10	50	Park & Rec	0.40	3.40	0.10
BLOWER	2002	Mix	26	52	Solid Waste	0.35	5.30	0.25
WEEDEATER	2002	Mix	26	52	Solid Waste	0.35	5.30	0.25
BLOWER	2007	Mix	26	52	Solid Waste	0.34	1.77	0.25
9 Chainsaws		Mix	10	50	Park & Rec	0.33	1.70	0.10
2 Chainsaws		Mix	10	50	Park & Rec	0.33	1.70	0.10
5 Chainsaws		Mix	10	50	Park & Rec	0.33	1.70	0.10
3 Chainsaws		Mix	10	50	Park & Rec	0.33	1.70	0.10
4 Chainsaws		Mix	6	40	Park & Rec	0.26	1.36	0.06
2 Polesaw		Mix	8	40	Park & Rec	0.26	1.36	0.08
4 Chainsaw		Mix	8	40	Park & Rec	0.26	1.36	0.08
2 Brushcutter		Mix	8	40	Park & Rec	0.26	1.36	0.08
Lawn Vacuum		Gasoline	3	10	Area Mental Health	0.24	0.01	0.03
Lawn Vacuum		Gasoline	3	10	Area Mental Health	0.24	0.01	0.03
Lawn Vacuum		Gasoline	3	10	Area Mental Health	0.24	0.01	0.03
VACCUM	2002	Gasoline	5	10	Solid Waste	0.20	0.85	0.05
1 Tiller		Mix	5	25	Park & Rec	0.20	1.70	0.05
1 Tiller		Mix	5	25	Park & Rec	0.20	1.70	0.05
1 Trimmers		Mix	6	30	Park & Rec	0.20	1.02	0.06
2 Chainsaws		Mix	6	30	Park & Rec	0.20	1.02	0.06
8 Chainsaws		Mix	96	18	Park & Rec	0.12	0.61	0.93

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
1 Blowers		Mix	2	10	Park & Rec	0.08	0.68	0.02
1 Chainsaws		Mix	2	10	Park & Rec	0.07	0.34	0.02
1 Chainsaws		Mix	2	10	Park & Rec	0.07	0.34	0.02
SALT SPREADER	2005	Gasoline	1	1	Solid Waste	0.06	0.00	0.01
Ultra-Low Volume (ULV) Aersol Generator	1982	Gasoline	1	1	Health	0.04	0.00	0.01
Ultra-Low Volume (ULV) Aersol Generator	1989	Gasoline	1	1	Health	0.04	0.00	0.01
1 Chainsaws		Mix	12	2	Park & Rec	0.01	0.07	0.12
Backpack Mist Duster	1996	Gasoline	1	1	Health	0.01	0.10	0.01
Industrial Tractor	1984	Diesel	0	0	Stormwater	0.00	0.00	0.00
507 - Hickory Grove - Fork Lift	1987	Diesel	260	200	Solid Waste	0.00	0.00	2.91
Chipper/ 1VRC14136H1000102	1989	Diesel	0	0	Stormwater	0.00	0.00	0.00
SWZ934 SCREENER	2006	Diesel	0	0	Solid Waste	0.00	0.00	0.00
SWL217 LOADER	2006	Diesel	0	0	Solid Waste	0.00	0.00	0.00
SWL216 LOADER	2006	Diesel	0	0	Solid Waste	0.00	0.00	0.00
SWL218 LOADER	2007	Diesel	0	0	Solid Waste	0.00	0.00	0.00
ATV / 2GLSOBT77NV25813	2007	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 164422103	2007	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 279945540	2006	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Blower / 260561189	2004	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Blower / 260561191	2004	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 255931555	1997	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 252478994	2003	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 26076216	1998	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 255981391	2003	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 262673275	2004	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 154219337	1997	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 157632977	2003	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Chainsaw / 124516912	2002	Gasoline	0	0	Stormwater	0.00	0.00	0.00

2006 Emission Inventory (continued)

Equipment Description/ID	Year	Fuel Type	Fuel Used (gal.)	Hours Operated	Department	NOx (lbs)	PM10 (lbs)	CO2 (tons)
Weedeater / 245227003	2002	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Weedeater / 255064627	2002	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Weedeater / 245064623	2002	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Weedeater / 245272022	2003	Gasoline	0	0	Stormwater	0.00	0.00	0.00
One man Auger / 33663	2001	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Tiller / 271160907	2007	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Hydro-Seeder / 44072	1987	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Welder / 3419705131	2005	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Salt Spreader / 02071920	2003	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Air Compressor / 30027616850	2002	Gasoline	0	0	Stormwater	0.00	0.00	0.00
Water pump / 92072210	1995	Gasoline	0	0	Stormwater	0.00	0.00	0.00
20" Snow blower		Gasoline	0	0	Area Mental Health	0.00	0.00	0.00
20" Snow blower		Gasoline	0	0	Area Mental Health	0.00	0.00	0.00
20" Snow blower		Gasoline	0	0	Area Mental Health	0.00	0.00	0.00
Utility Vehicle/6046		Gasoline	0	0	Park & Rec	0.00	0.00	0.00

Appendix B

Mecklenburg County Air Quality Nonroad Emission Inventory Procedures

Prepared January 2008

1. Collect data from individual departments and compile into one spreadsheet

Collect an equipment list from all County departments that operate nonroad equipment. The following should be provided for each piece of equipment:

- Equipment Identification number
- Equipment type/description
- Engine model year
- Engine horsepower
- Fuel type
- Number of hours operated in the previous year

The equipment should be combined into a single master list and separated by fuel type (diesel or gasoline). Each piece of equipment should be labeled by department.

2. Diesel Equipment Emission Calculations

a. Assign Tier Ratings

Each piece of diesel equipment must be assigned a tier rating. Engines with a model year older than 1988 are Base engines. Engines from 1988 until EPA's Tier 1 rules became applicable are Tier 0. All other engine model year/horsepower combinations are assigned a tier (1-4) based on EPA's engine standards.

b. Assign Emission Factors

The file "Nonroad Diesel Emission Factors.doc" contains emission factor look up charts for nitrogen oxides (NO_x), hydrocarbons (THC), carbon monoxide (CO), and particulate matter (PM₁₀). Each pollutant's chart lists types of nonroad equipment by horsepower category, and emission factors for each tier rating. Emission factors are given in units of grams/hp-hr. Choose the correct emission factor for each piece of equipment for each pollutant.

c. Calculate Emissions

The emission factors for each engine should be multiplied by the engine's horsepower and the number of hours it was operated in the past year to get total emissions.

3. Gasoline Equipment Calculations

a. Separate equipment into groups by the following categories: small handheld equipment, small non handheld equipment, large equipment (>25 hp), ATVs, and marine equipment.

b. Assign Emission Factors (from file "Gasoline Emission Factors.doc")

- Small handheld equipment: This equipment is divided into 3 classes (III, IV, V) by engine size (displacement/horsepower). Emission factors for uncontrolled, phase 1 and phase 2 standards are given in the look up chart "Handheld EFs". Units are grams/hp-hr.
- Small non handheld equipment: This equipment is divided into 2 classes (I, II) by engine size (displacement/horsepower). Emission factors for uncontrolled, phase 1 and phase 2 standards are given in the look up chart "Non handheld EFs". Units are grams/hp-hr.

- Large equipment: This equipment is powered by gasoline engines greater than 25 horsepower. Emission factors for uncontrolled, phase 1 and phase 2 standards are given in the look up chart ">25hp EF". Units are grams/hp-hr.
 - ATVs: ATVs are primarily powered by 4 stroke engines and are either uncontrolled or meet phase 1 standards. Emission factors are given in the look up chart "ATV". The initial emission factors were given in units of grams/mile, but to be consistent with the data provided and other calculations, they were converted to grams/hour assuming an average speed of 20 mph.
 - Marine: There are a variety of technology types associated with marine engines. Because of this variety and the fact that the county only has a few marine engines, a look up table was not developed. Individual equipment was researched to determine the appropriate emission factor from EPA's document "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition".
- c. Calculate Emissions
- The emission factors for each engine should be multiplied by the horsepower of each engine and the number of hours the engine was operated in the past year to get total emissions, except for the ATV category. ATV emission factors should just be multiplied by the number of operating hours.

4. Emission Factor Sources

a. Diesel

Diesel emission factors were obtained directly from EPA's NONROAD Model (2005). Exhaust emission factors are provided for nitrogen oxides (NO_x), total hydrocarbons (THC) carbon monoxide (CO), and particulate matter (PM₁₀). These emission factors are listed by source classification code (SCC), horsepower range, and technology type. The source classification code was assigned based on equipment description, and the technology type was based on engine model year and horsepower. Emission factors are given in units of g/hp-hr and should be multiplied by engine horsepower and number of operating hours to get total emissions.

b. Gasoline

Gasoline emission factors were obtained indirectly from EPA's NONROAD Model (2005) for the same pollutants. Emission factors are listed by technology type in the EPA document "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition (December 2005)". There are many more technology types for gasoline engines than there are diesels, and they are not always identifiable by just engine model year and horsepower. When there was a question about which technology type to use, the technology distribution files from the NONROAD Model were used. In most cases there was a clear picture of which was the predominant technology for a given model year and this emission factor was used. These emission factors are broken down by equipment type (small handheld equipment, small non handheld equipment, large equipment, ATVs, and marine engines). Within each equipment category, emission factors varied by model year and horsepower.