Appendix A: Oil and Gas NEI SCCs

This Appendix provides a list SCCs that are considered representative of the oil and gas sector from the 2008 NEI point, nonpoint and nonroad mobile inventories. We removed these SCCs for counties where we used WRAP Phase III oil and gas emissions in the 2007v5 platform. This complete list of potential SCCs are provided in Table A-1. Many of these SCCs were not reported in the 2008 NEI –see column "Reported?" equals "N". The complete list is provided here to aid in data reconciliation for future versions of the NEI that may have some SCCs not in the 2008 NEI. In addition, we did not remove the nonroad diesel vehicle SCC = 22700100100; these emissions are very small but potentially double-counted in the 2007 platform.

Table A-1: List of 2008 NEI SCCs Removed from 2007 Platform for WRAP Phase III Oil and Gas Inventories

Reported?	SCC	Category	Description
Y	2270010010	Nonroad	Mobile - Non-Road Equipment - Diesel; Mobile Sources; Off-highway Vehicle Diesel; Industrial Equipment; Other Oil Field Equipment
Y	2310000000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; All Processes; Total: All Processes
Y	2310000220	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; All Processes; Drill Rigs
Y	2310000330	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; All Processes; Artificial Lift
Y	2310010000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Crude Petroleum; Total: All Processes
Y	2310010100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Crude Petroleum; Oil Well Heaters
Y	2310010200	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Crude Petroleum; Oil Well Tanks - Flashing & Standing/Working/Breathing
Y	2310011020	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Storage Tanks: Crude Oil
Y	2310011100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Heater Treater
Y	2310011201	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Tank Truck/Railcar Loading: Crude Oil
Y	2310011450	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Wellhead
Y	2310011501	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: Connectors
Y	2310011502	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: Flanges
Y	2310011503	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: Open Ended Lines
Y	2310011504	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: Pumps
Y	2310011505	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: Valves
Y	2310011506	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: Other

Reported?	SCC	Category	Description
Y	2310020000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas; Total: All Processes
Y	2310020600	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas; Compressor Engines
Y	2310021010	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Storage Tanks: Condensate
Y	2310021030	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Tank Truck/Railcar Loading: Condensate
Y	2310021100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Gas Well Heaters
Y	2310021101	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 2Cycle Lean Burn Compressor Engines < 50 HP
Y	2310021102	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 2Cycle Lean Burn Compressor Engines 50 To 499 HP
Y	2310021203	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 4Cycle Lean Burn Compressor Engines 500+ HP
Y	2310021300	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Gas Well Pneumatic Devices
Y	2310021301	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 4Cycle Rich Burn Compressor Engines <50 HP
Y	2310021302	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP
Y	2310021400	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Gas Well Dehydrators
Y	2310021402	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Nat Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP w/NSCR
Y	2310021403	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Nat Gas Fired 4Cycle Rich Burn Compressor Engines 500+ HP w/NSCR
Y	2310021501	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: Connectors
Y	2310021502	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: Flanges
Y	2310021503	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: Open Ended Lines
Y	2310021504	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: Pumps

Reported?	SCC	Category	Description
Y	2310021505	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: Valves
Y	2310021506	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: Other
Y	2310021509	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Fugitives: All Processes
Y	2310021600	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Gas Well Venting
Y	2310030000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas Liquids; Total: All Processes
Y	2310111700	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Exploration; Oil Well Completion: All Processes
Y	2310111702	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Exploration; Oil Well Completion: Venting
Y	2310121401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Exploration; Gas Well Pneumatic Pumps
Y	2310121700	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Exploration; Gas Well Completion: All Processes
Y	2310121702	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Exploration; Gas Well Completion: Venting
Y	31000101	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Complete Well: Fugitive Emissions
Y	31000102	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Miscellaneous Well: General
Y	31000103	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Wells: Rod Pumps
Y	31000104	Point	Industrial Processes - Storage and Transfer; Industrial Processes; Oil and Gas Production; Crude Oil Production; Crude Oil Sumps
Y	31000105	Point	Industrial Processes - Storage and Transfer; Industrial Processes; Oil and Gas Production; Crude Oil Production; Crude Oil Pits
Y	31000107	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Oil/Gas/Water/Separation
Y	31000108	Point	Industrial Processes - Storage and Transfer; Industrial Processes; Oil and Gas Production; Crude Oil Production; Evaporation from Liquid Leaks into Oil Well Cellars
Y	31000123	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Well Casing Vents

Reported?	SCC	Category	Description
Y	31000124	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Valves: General
Y	31000125	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Relief Valves
Y	31000126	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Pump Seals
Y	31000127	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Flanges and Connections
Y	31000128	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Oil Heating
Y	31000129	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Gas/Liquid Separation
Y	31000130	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Fugitives: Compressor Seals
Y	31000131	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Fugitives: Drains
Y	31000132	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Atmospheric Wash Tank (2nd Stage of Gas-Oil Separation): Flashing Loss
Y	31000146	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Gathering Lines
Y	31000160	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Flares
Y	31000199	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Processing Operations: Not Classified
Y	31000201	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Gas Sweetening: Amine Process
Y	31000202	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Gas Stripping Operations
Y	31000203	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Compressors
Y	31000204	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Wells
Y	31000205	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Flares
Y	31000206	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Gas Lift
Y	31000207	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Valves: Fugitive Emissions
Y	31000208	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Sulfur Recovery Unit
Y	31000209	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Incinerators Burning Waste Gas or Augmented Waste Gas

Reported?	SCC	Category	Description
Y	31000211	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Pipeline Pigging (releases during pig removal)
Y	31000215	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Flares Combusting Gases :1000 BTU/scf
Y	31000216	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Flares Combusting Gases <1000 BTU/scf
Y	31000220	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; All Equipt Leak Fugitives (Valves, Flanges, Connections, Seals, Drains
Y	31000223	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Relief Valves
Y	31000224	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Pump Seals
Y	31000225	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Compressor Seals
Y	31000226	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Flanges and Connections
Y	31000227	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Glycol Dehydrator Reboiler Still Stack
Y	31000228	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Glycol Dehydrator Reboiler Burner
Y	31000229	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Gathering Lines
Y	31000230	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Hydrocarbon Skimmer
Y	31000231	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Fugitives: Drains
Y	31000299	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Other Not Classified
Y	31000301	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Reboiler Still Vent: Triethylene Glycol
Y	31000302	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Reboiler Burner Stack: Triethylene Glycol
Y	31000303	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Phase Separator Vent: Triethylene Glycol
Y	31000304	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Ethylene Glycol: General

Reported?	SCC	Category	Description
Y	31000305	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Gas Sweeting: Amine Process
Y	31000306	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Process Valves
Y	31000307	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Relief Valves
Y	31000309	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Compressor Seals
Y	31000310	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Pump Seals
Y	31000311	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Flanges and Connections
Y	31000321	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Niagaran Formation (Mich.)
Y	31000322	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Prairie du Chien Formation (Mich.)
Y	31000323	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Glycol Dehydrators: Antrim Formation (Mich.)
Y	31000401	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Distillate Oil (No. 2)
Y	31000402	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Residual Oil
Y	31000403	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Crude Oil
Y	31000404	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Natural Gas
Y	31000405	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Process Gas
Y	31000406	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Propane/Butane
Y	31000411	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Distillate Oil (No. 2): Steam Generators
Y	31000412	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Residual Oil: Steam Generators
Y	31000413	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Crude Oil: Steam Generators
Y	31000414	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Natural Gas: Steam Generators
Y	31000415	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Process Heaters; Process Gas: Steam Generators

Reported?	SCC	Category	Description
Y	31000502	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Liquid Waste Treatment; Liquid - Liquid Separator
Y	31000503	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Liquid Waste Treatment; Oil-Water Separator
Y	31000504	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Liquid Waste Treatment; Oil-Sludge-Waste Water Pit
Y	31000506	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Liquid Waste Treatment; Oil-Water Separation Wastewater Holding Tanks
Y	31088801	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Fugitive Emissions; Specify in Comments Field
Y	31088802	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Fugitive Emissions; Specify in Comments Field
Y	31088803	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Fugitive Emissions; Specify in Comments Field
Y	31088804	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Fugitive Emissions; Specify in Comments Field
Y	31088805	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Fugitive Emissions; Specify in Comments Field
Y	31088811	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Fugitive Emissions; Fugitive Emissions
Y	31700101	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; NGTS; Natural Gas Transmission and Storage Facilities; Pneumatic Controllers Low Bleed
Y	40400300	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank: Flashing Loss
Y	40400301	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank: Breathing Loss
Y	40400302	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank: Working Loss
Y	40400303	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank with Primary Seals: Standing Loss
Y	40400304	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank with Secondary Seals: Standing Loss
Y	40400305	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank: Standing Loss
Y	40400306	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank: Withdrawal Loss

Reported?	SCC	Category	Description
Y	40400307	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank: Withdrawal Loss
Y	40400311	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Condensate, working+breathing+flashing losses
Y	40400312	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Crude Oil, working+breathing+flashing losses
Y	40400313	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Lube Oil, working+breathing+flashing losses
Y	40400314	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Specialty Chem-working+breathing+flashing
Y	40400315	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Produced Water, working+breathing+flashing
Y	40400316	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Diesel, working+breathing+flashing losses
Y	40400321	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank, Condensate, working+breathing+flashing
Y	40400322	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank, Crude Oil, working+breathing+flashing
Y	40400323	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank, Lube Oil, working+breathing+flashing
Y	40400324	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank, Specialty Chem-working+breathing+flashing
Y	40400326	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank, Diesel, working+breathing+flashing
Y	40400331	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank, Condensate, working+breathing+flashing
Y	40400332	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank, Crude Oil, working+breathing+flashing
Y	40400334	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank, Specialty Chem-working+breathing+flashing
Y	40400335	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank, Produced Water-working+breathing+flashing
N	2310000440	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; All Processes; Saltwater Disposal Engines
N	2310001000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; All Processes : On-shore; Total: All Processes

Reported?	SCC	Category	Description
N	2310002000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil And Gas Production; Total: All Processes
N	2310002301	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil And Gas Production; Flares: Continuous Pilot Light
N	2310002305	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil And Gas Production; Flares: Flaring Operations
N	2310002401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil And Gas Production; Pneumatic Pumps: Gas And Oil Wells
N	2310002411	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil And Gas Production; Pressure/Level Controllers
N	2310002421	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil And Gas Production; Cold Vents
N	2310010300	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Crude Petroleum; Oil Well Pneumatic Devices
N	2310010700	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Crude Petroleum; Oil Well Fugitives
N	2310010800	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Crude Petroleum; Oil Well Truck Loading
N	2310011000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Total: All Processes
N	2310011500	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Production; Fugitives: All Processes
N	2310012000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Total: All Processes
N	2310012020	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Storage Tanks: Crude Oil
N	2310012201	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Barge Loading: Crude Oil
N	2310012511	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Connectors: Oil Streams
N	2310012512	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Flanges: Oil
N	2310012515	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Valves: Oil
N	2310012516	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Other: Oil

Reported?	SCC	Category	Description
N	2310012521	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Connectors: Oil/Water Streams
N	2310012522	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Flanges: Oil/Water
N	2310012525	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Valves: Oil/Water
N	2310012526	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Production; Fugitives, Other: Oil/Water
N	2310020700	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas; Gas Well Fugitives
N	2310020800	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas; Gas Well Truck Loading
N	2310021000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Total: All Processes
N	2310021103	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 2Cycle Lean Burn Compressor Engines 500+ HP
N	2310021109	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Total: All Natural Gas Fired 2Cycle Lean Burn Compressor Engines
N	2310021201	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 4Cycle Lean Burn Compressor Engines <50 HP
N	2310021202	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 4Cycle Lean Burn Compressor Engines 50 To 499 HP
N	2310021209	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Total: All Natural Gas Fired 4Cycle Lean Burn Compressor Engines
N	2310021303	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Natural Gas Fired 4Cycle Rich Burn Compressor Engines 500+ HP
N	2310021309	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Total: All Natural Gas Fired 4Cycle Rich Burn Compressor Engines
N	2310021401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Nat Gas Fired 4Cycle Rich Burn Compressor Engines <50 HP w/NSCR
N	2310021409	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Total: All Nat Gas Fired 4Cycle Rich Burn Compressor Engines w/NSCR
N	2310021410	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Amine Unit
N	2310021450	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Wellhead

Reported?	SCC	Category	Description
N	2310021500	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Production; Gas Well Completion - Flaring And Venting
N	2310022000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Total: All Processes
N	2310022010	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Storage Tanks: Condensate
N	2310022051	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Turbines: Natural Gas
N	2310022090	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Boilers/Heaters: Natural Gas
N	2310022101	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 2Cycle Lean Burn Compressor Engines < 50 HP
N	2310022102	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 2Cycle Lean Burn Compressor Engines 50 To 499 HP
N	2310022103	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 2Cycle Lean Burn Compressor Engines 500+ HP
N	2310022105	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Diesel Engines
N	2310022109	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Total: All Natural Gas Fired 2Cycle Lean Burn Compressor Engines
N	2310022201	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 4Cycle Lean Burn Compressor Engines <50 HP
N	2310022202	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 4Cycle Lean Burn Compressor Engines 50 To 499 HP
N	2310022203	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 4Cycle Lean Burn Compressor Engines 500+ HP
N	2310022300	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Compressor Engines: 4Cycle Rich
N	2310022301	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 4Cycle Rich Burn Compressor Engines <50 HP
N	2310022302	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP
N	2310022303	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Natural Gas Fired 4Cycle Rich Burn Compressor Engines 500+ HP
N	2310022401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Nat Gas Fired 4Cycle Rich Burn Compressor Engines <50 HP w/NSCR

Reported?	SCC	Category	Description
N	2310022402	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Nat Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP w/NSCR
N	2310022403	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Nat Gas Fired 4Cycle Rich Burn Compressor Engines 500+ HP w/NSCR
N	2310022409	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Total: All Nat Gas Fired 4Cycle Rich Burn Compressor Engines w/NSCR
N	2310022410	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Amine Unit
N	2310022420	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Dehydrator
N	2310022501	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Fugitives, Connectors: Gas Streams
N	2310022502	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Fugitives, Flanges: Gas Streams
N	2310022505	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Fugitives, Valves: Gas
N	2310022506	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Production; Fugitives, Other: Gas
N	2310023000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas; Cbm Gas Well - Dewatering Pump Engines
N	2310030210	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas Liquids; Gas Well Tanks - Flashing & Standing/Working/Breathing, Uncontrolled
N	2310030220	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas Liquids; Gas Well Tanks - Flashing & Standing/Working/Breathing, Controlled
N	2310031000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas Liquids : On-shore; Total: All Processes
N	2310032000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Natural Gas Liquids : Off-shore; Total: All Processes
N	2310111000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Exploration; All Processes
N	2310111100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Exploration; Mud Degassing
N	2310111401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Exploration; Oil Well Pneumatic Pumps
N	2310111701	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Oil Exploration; Oil Well Completion: Flaring

Reported?	SCC	Category	Description
N	2310112000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Exploration; All Processes
N	2310112100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Exploration; Mud Degassing Activities
N	2310112401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Exploration; Oil Well Pneumatic Pumps
N	2310112700	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Exploration; Oil Well Completion: All Processes
N	2310112701	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Exploration; Oil Well Completion: Flaring
N	2310112702	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Oil Exploration; Oil Well Completion: Venting
N	2310121000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Exploration; All Processes
N	2310121100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Exploration; Mud Degassing
N	2310121701	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; On-Shore Gas Exploration; Gas Well Completion: Flaring
N	2310122000	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Exploration; All Processes
N	2310122100	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Exploration; Mud Degassing
N	2310122401	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Exploration; Gas Well Pneumatic Pumps
N	2310122700	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Exploration; Gas Well Completion: All Processes
N	2310122701	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Exploration; Gas Well Completion: Flaring
N	2310122702	Nonpoint	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Exploration and Production; Off-Shore Gas Exploration; Gas Well Completion: Venting
N	31000106	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Enhanced Wells, Water Reinjection
N	31000121	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Site Preparation
N	31000122	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Drilling and Well Completion

Reported?	SCC	Category	Description
N	31000140	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Waste Sumps: Primary Light Crude
N	31000141	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Waste Sumps: Primary Heavy Crude
N	31000142	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Waste Sumps: Secondary Light Crude
N	31000143	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Waste Sumps: Secondary Heavy Crude
N	31000144	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Waste Sumps: Tertiary Light Crude
N	31000145	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Crude Oil Production; Waste Sumps: Tertiary Heavy Crude
N	31000221	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Site Preparation
N	31000222	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Production; Drilling and Well Completion
N	31000308	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Open-ended Lines
N	31000324	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Pneumatic Controllers Low Bleed
N	31000325	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Natural Gas Processing Facilities; Pneumatic Controllers High Bleed >6 scfm
N	31000501	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Liquid Waste Treatment; Floatation Units
N	31000505	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; Oil and Gas Production; Liquid Waste Treatment; Sand Filter Operation
N	31700102	Point	Industrial Processes - Oil & Gas Production; Industrial Processes; NGTS; Natural Gas Transmission and Storage Facilities; Pneumatic Controllers High Bleed >6 scfm
N	40400325	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; External Floating Roof Tank, Produced Water-working+breathing+flashing
N	40400333	Point	Industrial Processes - Storage and Transfer; Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery); Oil and Gas Field Storage and Working Tanks; Internal Floating Roof Tank, Lube Oil, working+breathing+flashing

Appendix B: Mapping of Fuel Distribution SCCs to BTP, BPS and RBT

Table B-1 provides a crosswalk between SCC and classification type for portable fuel containers (PFC), fuel distribution operations associated with the bulk-plant-to-pump (BTP), refinery to bulk terminal (RBT) and bulk plant storage (BPS).

Table B-1. Crosswalk of SCC to PFC, BTP, BPS, and RBT

SCC	Description	Type
40300201	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Deleted - Do Not Use (See 4-03-011 and 4-07);Gasoline	RBT
40300302	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Deleted - Do Not Use (See 4-03-011 and 4-07);Gasoline	RBT
40301001	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Gasoline RVP 13: Breathing Loss (67000 Bbl. Tank Size)	RBT
40301002	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Gasoline RVP 10: Breathing Loss (67000 Bbl. Tank Size)	RBT
40301003	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Gasoline RVP 7: Breathing Loss (67000 Bbl. Tank Size)	RBT
40301004	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Gasoline RVP 13: Breathing Loss (250000 Bbl. Tank Size)	RBT
40301006	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Gasoline RVP 7: Breathing Loss (250000 Bbl. Tank Size)	RBT
40301007	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Gasoline RVP 13: Working Loss (Tank Diameter Independent)	RBT
40301101	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Gasoline RVP 13: Standing Loss (67000 Bbl. Tank Size)	RBT
40301102	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Gasoline RVP 10: Standing Loss (67000 Bbl. Tank Size)	RBT
40301103	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Gasoline RVP 7: Standing Loss (67000 Bbl. Tank Size)	RBT
40301105	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Gasoline RVP 10: Standing Loss (250000 Bbl. Tank Size)	RBT
40301151	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Gasoline: Standing Loss - Internal	RBT
40301202	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Variable Vapor Space;Gasoline RVP 10: Filling Loss	RBT
40301203	Petroleum and Solvent Evaporation;Petroleum Product Storage at Refineries;Variable Vapor Space;Gasoline RVP 7: Filling Loss	RBT
40400100	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;undefined	RBT
40400101	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	RBT
40400102	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	RBT
40400103	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Breathing Loss (67000 Bbl. Capacity) - Fixed Roof Tank	RBT
40400104	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Breathing Loss (250000 Bbl Capacity)-Fixed Roof Tank	RBT

SCC	Description	Type
40400105	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Breathing Loss (250000 Bbl Capacity)-Fixed Roof Tank	RBT
40400106	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Breathing Loss (250000 Bbl Capacity) - Fixed Roof Tank	RBT
40400107	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Working Loss (Diam. Independent) - Fixed Roof Tank	RBT
40400108	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Working Loss (Diameter Independent) - Fixed Roof Tank	RBT
40400109	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Working Loss (Diameter Independent) - Fixed Roof Tank	RBT
40400110	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Standing Loss (67000 Bbl Capacity)-Floating Roof Tank	RBT
40400111	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Standing Loss (67000 Bbl Capacity)-Floating Roof Tank	RBT
40400112	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Standing Loss (67000 Bbl Capacity)-Floating Roof Tank	RBT
40400113	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Standing Loss (250000 Bbl Cap.) - Floating Roof Tank	RBT
40400114	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Standing Loss (250000 Bbl Cap.) - Floating Roof Tank	RBT
40400115	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Standing Loss (250000 Bbl Cap.) - Floating Roof Tank	RBT
40400116	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13/10/7: Withdrawal Loss (67000 Bbl Cap.) - Float Rf Tnk	RBT
40400117	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13/10/7: Withdrawal Loss (250000 Bbl Cap.) - Float Rf Tnk	RBT
40400118	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	RBT
40400119	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	RBT
40400120	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	RBT
40400130	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Specify Liquid: Standing Loss - External Floating Roof w/ Primary Seal	RBT
40400131	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Primary Seal	RBT
40400132	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Standing Loss - Ext. Floating Roof w/ Primary Seal	RBT
40400133	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Standing Loss - External Floating Roof w/ Primary Seal	RBT

SCC	Description	Type
40400140	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Specify Liquid: Standing Loss - Ext. Float Roof Tank w/ Second'y Seal	RBT
40400141	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Secondary Seal	RBT
40400142	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Standing Loss - Ext. Floating Roof w/ Secondary Seal	RBT
40400143	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Standing Loss - Ext. Floating Roof w/ Secondary Seal	RBT
40400148	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13/10/7: Withdrawal Loss - Ext. Float Roof (Pri/Sec Seal)	RBT
40400149	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Specify Liquid: External Floating Roof (Primary/Secondary Seal)	RBT
40400150	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Miscellaneous Losses/Leaks: Loading Racks	RBT
40400151	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Valves, Flanges, and Pumps	RBT
40400152	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Vapor Collection Losses	RBT
40400153	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Vapor Control Unit Losses	RBT
40400160	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Specify Liquid: Standing Loss - Internal Floating Roof w/ Primary Seal	RBT
40400161	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Primary Seal	RBT
40400162	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Standing Loss - Int. Floating Roof w/ Primary Seal	RBT
40400163	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Standing Loss - Internal Floating Roof w/ Primary Seal	RBT
40400170	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Specify Liquid: Standing Loss - Int. Floating Roof w/ Secondary Seal	RBT
40400171	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Secondary Seal	RBT
40400172	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 10: Standing Loss - Int. Floating Roof w/ Secondary Seal	RBT
40400173	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 7: Standing Loss - Int. Floating Roof w/ Secondary Seal	RBT
40400178	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Gasoline RVP 13/10/7: Withdrawal Loss - Int. Float Roof (Pri/Sec Seal)	RBT
40400179	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;Specify Liquid: Internal Floating Roof (Primary/Secondary Seal)	RBT
40400199	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Terminals;See Comment **	RBT
40400201	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	BTP
40400202	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	BTP

SCC	Description	Type
40400203	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 7: Breathing Loss (67000 Bbl. Capacity) - Fixed Roof Tank	BPS
40400204	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Working Loss (67000 Bbl. Capacity) - Fixed Roof Tank	BPS
40400205	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Working Loss (67000 Bbl. Capacity) - Fixed Roof Tank	BPS
40400206	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 7: Working Loss (67000 Bbl. Capacity) - Fixed Roof Tank	BTP
40400207	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Standing Loss (67000 Bbl Cap.) - Floating Roof Tank	BTP
40400208	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Standing Loss (67000 Bbl Cap.) - Floating Roof Tank	BPS
40400210	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13/10/7: Withdrawal Loss (67000 Bbl Cap.) - Float Rf Tnk	BPS
40400211	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	BTP
40400212	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	BTP
40400213	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 7: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	BTP
40400230	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Specify Liquid: Standing Loss - External Floating Roof w/ Primary Seal	BTP
40400231	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Primary Seal	BTP
40400232	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Standing Loss - Ext. Floating Roof w/ Primary Seal	BPS
40400233	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 7: Standing Loss - External Floating Roof w/ Primary Seal	BTP
40400240	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Specify Liquid: Standing Loss - Ext. Floating Roof w/ Secondary Seal	RBT
40400241	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Secondary Seal	BPS
40400248	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10/13/7: Withdrawal Loss - Ext. Float Roof (Pri/Sec Seal)	BPS
40400249	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Specify Liquid: External Floating Roof (Primary/Secondary Seal)	RBT
40400250	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Loading Racks	BPS
40400251	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Valves, Flanges, and Pumps	BPS
40400252	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Miscellaneous Losses/Leaks: Vapor Collection Losses	BPS
40400253	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Miscellaneous Losses/Leaks: Vapor Control Unit Losses	BPS

SCC	Description	Type
40400260	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Specify Liquid: Standing Loss - Internal Floating Roof w/ Primary Seal	RBT
40400261	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Primary Seal	BTP
40400262	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Standing Loss - Int. Floating Roof w/ Primary Seal	BTP
40400263	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 7: Standing Loss - Internal Floating Roof w/ Primary Seal	BTP
40400270	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Specify Liquid: Standing Loss - Int. Floating Roof w/ Secondary Seal	BPS
40400271	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Secondary Seal	BTP
40400272	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10: Standing Loss - Int. Floating Roof w/ Secondary Seal	BPS
40400273	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 7: Standing Loss - Int. Floating Roof w/ Secondary Seal	BPS
40400278	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Gasoline RVP 10/13/7: Withdrawal Loss - Int. Float Roof (Pri/Sec Seal)	BTP
40400279	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Bulk Plants;Specify Liquid: Internal Floating Roof (Primary/Secondary Seal)	BPS
40400401	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Petroleum Products - Underground Tanks;Gasoline RVP 13: Breathing Loss	BTP
40400402	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Petroleum Products - Underground Tanks;Gasoline RVP 13: Working Loss	BTP
40400403	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Petroleum Products - Underground Tanks;Gasoline RVP 10: Breathing Loss	BTP
40400404	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Petroleum Products - Underground Tanks;Gasoline RVP 10: Working Loss	BTP
40400405	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Petroleum Products - Underground Tanks;Gasoline RVP 7: Breathing Loss	BTP
40400406	Petroleum and Solvent Evaporation;Petroleum Liquids Storage (non-Refinery);Petroleum Products - Underground Tanks;Gasoline RVP 7: Working Loss	BTP
40600100	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;undefined	BTP
40600101	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Splash Loading	BTP
40600126	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Submerged Loading	BTP
40600131	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Submerged Loading (Normal Service)	BTP
40600136	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Splash Loading (Normal Service)	BTP
40600141	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Submerged Loading (Balanced Service)	BTP

SCC	Description	Type
40600144	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Splash Loading (Balanced Service)	BTP
40600147	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Submerged Loading (Clean Tanks)	BTP
40600162	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Loaded with Fuel (Transit Losses)	BTP
40600163	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Gasoline: Return with Vapor (Transit Losses)	BTP
40600197	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Not Classified	BTP
40600198	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Not Classified	BTP
40600199	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Not Classified	BTP
40600231	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Ship Loading - Cleaned and Vapor Free Tanks	RBT
40600232	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Ocean Barges Loading	RBT
40600233	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Barge Loading - Cleaned and Vapor Free Tanks	BTP
40600234	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Ship Loading - Ballasted Tank	RBT
40600235	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Ocean Barges Loading - Ballasted Tank	BTP
40600236	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Ship Loading - Uncleaned Tanks	RBT
40600237	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Ocean Barges Loading - Uncleaned Tanks	RBT
40600238	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Barges Loading - Uncleaned Tanks	RBT
40600239	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Tanker Ship - Ballasted Tank Condition	RBT
40600240	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Barge Loading - Average Tank Condition	RBT
40600241	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Gasoline: Tanker Ship - Ballasting	BTP
40600298	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Not Classified	RBT
40600299	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Marine Vessels;Not Classified	RBT
40600301	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Gasoline Retail Operations - Stage I;Splash Filling	BTP
40600302	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Gasoline Retail Operations - Stage I;Submerged Filling w/o Controls	BTP
40600305	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Gasoline Retail Operations - Stage I;Unloading	BTP
40600306	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Gasoline Retail Operations - Stage I;Balanced Submerged Filling	BTP
40600307	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Gasoline Retail Operations - Stage I;Underground Tank Breathing and Emptying	BTP
40600399	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Gasoline Retail Operations - Stage I;Not Classified	BTP

SCC	Description	Type
40600401	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Filling Vehicle Gas Tanks - Stage II;Vapor Loss w/o Controls	BTP
40600403	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Filling Vehicle Gas Tanks - Stage II;Vapor Loss w/o Controls	BTP
40600501	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Pipeline Petroleum Transport - General - All Products;Pipeline Leaks	RBT
40600502	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Pipeline Petroleum Transport - General - All Products;Pipeline Venting	RBT
40600503	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Pipeline Petroleum Transport - General - All Products;Pump Station	RBT
40600504	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Pipeline Petroleum Transport - General - All Products;Pump Station Leaks	RBT
40600602	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Consumer (Corporate) Fleet Refueling - Stage II;Liquid Spill Loss w/o Controls	BTP
40600701	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Consumer (Corporate) Fleet Refueling - Stage I;Splash Filling	BTP
40600702	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Consumer (Corporate) Fleet Refueling - Stage I;Submerged Filling w/o Controls	BTP
40600706	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Consumer (Corporate) Fleet Refueling - Stage I;Balanced Submerged Filling	BTP
40600707	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Consumer (Corporate) Fleet Refueling - Stage I;Underground Tank Breathing and Emptying	BTP
40688801	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Fugitive Emissions;Specify in Comments Field	BTP
40688802	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Fugitive Emissions;Specify in Comments Field	BTP
40688803	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Fugitive Emissions;Specify in Comments Field	RBT
40688805	Petroleum and Solvent Evaporation;Transportation and Marketing of Petroleum Products;Fugitive Emissions;Specify in Comments Field	BTP
2501011011	Storage and Transport;Petroleum and Petroleum Product Storage;Residential Portable Gas Cans;Permeation	PFC
2501011012	Storage and Transport;Petroleum and Petroleum Product Storage;Residential Portable Gas Cans;Evaporation (includes Diurnal losses)	PFC
2501011013	Storage and Transport;Petroleum and Petroleum Product Storage;Residential Portable Gas Cans;Spillage During Transport	PFC
2501011014	Storage and Transport;Petroleum and Petroleum Product Storage;Residential Portable Gas Cans;Refilling at the Pump - Vapor Displacement	PFC
2501011015	Storage and Transport;Petroleum and Petroleum Product Storage;Residential Portable Gas Cans;Refilling at the Pump - Spillage	PFC
2501012011	Storage and Transport;Petroleum and Petroleum Product Storage;Commercial Portable Gas Cans;Permeation	PFC
2501012012	Storage and Transport;Petroleum and Petroleum Product Storage;Commercial Portable Gas Cans;Evaporation (includes Diurnal losses)	PFC
2501012013	Storage and Transport;Petroleum and Petroleum Product Storage;Commercial Portable Gas Cans;Spillage During Transport	PFC
2501012014	Storage and Transport;Petroleum and Petroleum Product Storage;Commercial Portable Gas Cans;Refilling at the Pump - Vapor Displacement	PFC
2501012015	Storage and Transport;Petroleum and Petroleum Product Storage;Commercial Portable Gas Cans;Refilling at the Pump - Spillage	PFC
2501050120	Storage and Transport;Petroleum and Petroleum Product Storage;Bulk Terminals: All Evaporative Losses;Gasoline	RBT
2501055120	Storage and Transport;Petroleum and Petroleum Product Storage;Bulk Plants: All Evaporative Losses;Gasoline	BPS
2501060051	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Submerged Filling	BTP

SCC	Description	Type
2501060052	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Splash Filling	BTP
2501060053	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 1: Balanced Submerged Filling	BTP
2501060100	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Stage 2: Total	BTP
2501060201	Storage and Transport;Petroleum and Petroleum Product Storage;Gasoline Service Stations;Underground Tank: Breathing and Emptying	BTP
2501995000	Storage and Transport;Petroleum and Petroleum Product Storage;All Storage Types: Working Loss;Total: All Products	BTP
2505000120	Storage and Transport;Petroleum and Petroleum Product Transport;All Transport Types;Gasoline	RBT
2505020120	Storage and Transport;Petroleum and Petroleum Product Transport;Marine Vessel;Gasoline	RBT
2505020121	Storage and Transport;Petroleum and Petroleum Product Transport;Marine Vessel;Gasoline - Barge	RBT
2505030120	Storage and Transport;Petroleum and Petroleum Product Transport;Truck;Gasoline	BTP
2505040120	Storage and Transport;Petroleum and Petroleum Product Transport;Pipeline;Gasoline	RBT
2660000000	Waste Disposal, Treatment, and Recovery;Leaking Underground Storage Tanks;Leaking Underground Storage Tanks;Total: All Storage Types	BTP

Appendix C: Crosswalk between 2007 AE6 profile codes and SPECIATE 4.3 profile codes

Table C-1 provides a crosswalk between the $PM_{2.5}$ speciation AE6 profile codes used in the 2007 platform and the equivalent profile codes in the SPECIATE 4.3 database. Although the codes themselves are different, the actual chemical profiles are equivalent.

Table C-1. Crosswalk of AE6 profiles between 2007 platform and SPECIATE 4.3

2007 platform profile	SPECIATE 4.3 profile	SPECIATE profile name
92000	91103	Agricultural Burning - inventory speciation
92001	91101	Agricultural Soil - inventory speciation
92002	91137	Aluminum Production - inventory speciation
92003	91163	Ammonium Nitrate Production - inventory speciation
92004	91181	Ammonium Sulfate Production - inventory speciation
92005	91159	Asphalt Manufacturing - inventory speciation
92006	91148	Asphalt Roofing - inventory speciation
92007	91180	Auto Body Shredding - inventory speciation
92008	91183	Boric Acid Manufacturing - inventory speciation
92009	91134	Brake Lining Dust - inventory speciation
92010	91171	Brick Grinding and Screening - inventory speciation
92011	91172	Calcium Carbide Furnace - inventory speciation
92012	91157	Cast Iron Cupola - inventory speciation
92013	91141	Catalytic Cracking - inventory speciation
92014	91127	Cement Production - inventory speciation
92015	91116	Charbroiling - inventory speciation
92016	91140	Charcoal Manufacturing - inventory speciation
92017	91124	Chemical Manufacturing - Avg - inventory speciation
92018	92018	Cigarette Smoke - Simplified
92019	91173	Coke Calciner - inventory speciation
92020	91107	Construction Dust - inventory speciation
92021	91170	Copper Production - inventory speciation
92022	91169	Crustal Material - inventory speciation
92023	91118	Dairy Soil - inventory speciation
92025	91115	Distillate Oil Combustion - inventory speciation
92026	91153	Electric Arc Furnace - inventory speciation
92027	91151	Ferromanganese Furnace - inventory speciation
92028	91142	Fiberglass Manufacturing - inventory speciation
92029	91160	Fly Ash - inventory speciation
92030	91130	Food & Ag - Handling - inventory speciation
92031	91154	Food & Ag-Drying - inventory speciation
92032	92032	Geothermal Background - Simplified
92033	91143	Glass Furnace - inventory speciation
92034	91166	Gypsum Manufacturing - inventory speciation
92035	91106	HDDV Exhaust - inventory speciation
92036	91123	Heat Treating - inventory speciation
92037	91123	Heat Treating - inventory speciation
92038	91121	Industrial Manufacturing - Avg - inventory speciation

2007 platform profile	SPECIATE 4.3 profile	SPECIATE profile name
92039	91174	Industrial Soil - inventory speciation
92040	91149	Inorganic Chemical Manufacturing - inventory speciation
92041	91182	Inorganic Fertilizer - inventory speciation
92042	91119	Kraft Recovery Furnace - inventory speciation
92043	91162	LDDV Exhaust - inventory speciation
92044	91178	Lead Production - inventory speciation
92045	91138	Lime Kiln - inventory speciation
92046	91164	Limestone Dust - inventory speciation
92047	91120	Mineral Products - Avg - inventory speciation
92048	91112	Natural Gas Combustion - inventory speciation
92049	91113	Nonroad Gasoline Exhaust - inventory speciation
92050	91122	Onroad Gasoline Exhaust - inventory speciation
92051	91133	Open Hearth Furnace - inventory speciation
92052	91147	Misc. Sources - inventory speciation
92053	91108	Paved Road Dust - inventory speciation
92054	91145	Petroleum Industry - Avg - inventory speciation
92055	91165	Phosphate Manufacturing - inventory speciation
92057	91125	Lignite Combustion - inventory speciation
92058	91175	Potato Deep Frying - inventory speciation
92059	91109	Prescribed Burning - inventory speciation
92060	91136	Process Gas Combustion - inventory speciation
92061	91144	Pulp & Paper Mills - inventory speciation
92062	91155	Residential Coal Combustion - inventory speciation
92063	91156	Residential Natural Gas Combustion - inventory speciation
92068	91105	Residential Wood Combustion - inventory speciation
92071	92071	Residential Wood Combustion: Synthetic - Simplified
92072	91117	Residual Oil Combustion - inventory speciation
92073	91111	Sand & Gravel - inventory speciation
92074	91161	Sandblast - inventory speciation
92075	91176	Sea Salt - inventory speciation
92076	91132	Aluminum Processing - inventory speciation
92077	91158	Copper Processing - inventory speciation
92078	91168	Lead Processing - inventory speciation
92079	91139	Sintering Furnace - inventory speciation
92080	91146	Slash Burning - inventory speciation
92081	91177	Sludge Combustion - inventory speciation
92082	91126	Solid Waste Combustion - inventory speciation
92083	91179	Steel Desulfurization - inventory speciation
92084	91110	Sub-Bituminous Combustion - inventory speciation
92085	91129	Surface Coating - inventory speciation
92087	91150	Tire Dust - inventory speciation
92088	91100	Unpaved Road Dust - inventory speciation
92089	91167	Urea Fertilizer - inventory speciation
92090	91102	Wildfires - inventory speciation

2007 platform profile	SPECIATE 4.3 profile	SPECIATE profile name
92091	91114	Wood Fired Boiler - inventory speciation
92092	91128	Wood Products - Drying - inventory speciation
92093	91128	Wood Products - Drying - inventory speciation
92094	91131	Wood Products-Sawing - inventory speciation
92095	91104	Bituminous Combustion - inventory speciation

Appendix D: Memo Describing the Differences in MOVES speciated PM and CMAQ PM

The following memo from Madeleine Strum describes in detail the differences between MOVES speciated PM and AE5 PM species and the derivation of the equations to convert between them. The original memo was "MOVES2010 PM25 Onroad Speciation method_24feb2011.docx" and has been copied below in full:

Interim Approach to develop CMAQ PM2.5 species from Partially-speciated MOVES2010 EXHAUST PM2.5

Introduction

This document presents the interim approach developed by OTAQ and OAQPS to speciate the partially speciated $PM_{2.5}$ exhaust emissions from MOVES2010. The advantage of using this approach over the approach used for speciating total $PM_{2.5}$ is that it allows the speciated emissions from MOVES; i.e., elemental carbon and particulate sulfate to be retained and only the remainder of the $PM_{2.5}$ to rely on speciation profiles.

The table below shows the MOVES2010 EXHAUST $PM_{2.5}$-related species and how they relate to the five CMAQ 4.7 model species: PEC, POC, PSO4, PNO3, and PMFINE

MOVES2010 Pollutant Name	shortName	Variable name for Equations	Relation to CMAQ model species
Primary Exhaust PM2.5 - Total	PM2.5 Total Exh	PM25_TOTAL	
Primary PM2.5 - Organic Carbon	PM2.5 Organic C	PM25OM	Sum[1] of **POC**, **PNO3** and **PMFINE**
Primary PM2.5 - Elemental Carbon	PM2.5 Elem C	PM25EC	**PEC**
Primary PM2.5 - Sulfate Particulate	PM2.5 Sulfate	PM25SO4	**PSO4**

We need to further disaggregate the MOVES species "PM25OM" into the CMAQ model species.

MOVES species are related as follows: PM25_TOTAL = PM25EC + PM25OM + PSO4

The five CMAQ species also sum to total $PM_{2.5}$:

$$PM_{2.5} = POC+PEC+PNO3+PSO4+PMFINE$$

Section 2 discusses the procedure we used when using the draft version of MOVES prior to the MOVES2010 release. The issues with this approach and rational for the changes for MOVES2010 are presented here.

Section 3 provides the approach, data and assumptions used.

Sections 4 and 5 present the equations to be used for 2 situations: 1) when MOVES is run with actual temperatures, such as the case when MOVES is run within the SMOKE model (currently under design) and

[1] For draft MOVES, for gasoline sources (in all cases using draft MOVES for the platform including 2005ai , 2005ak, 2005ap), this MOVES pollutant also included PSO4, since it was the difference of total $PM_{2.5}$ and PEC. With MOVES2010, this species is now the difference between total $PM_{2.5}$ and the sum of PEC and PSO4.

2) when MOVES is run at 72 F, such as the case when pre-computed MOVES emissions are input into SMOKE, and are adjusted based on gridded hourly temperatures prior to be input into CMAQ.

Background: Previous Approach Using Draft MOVES

When we received output from the draft version of MOVES for gasoline vehicles (summer 2008), it did not include Primary Exhaust $PM_{2.5}$ - Total. MOVES output provided emissions for the following:

1) Primary $PM_{2.5}$ - Elemental Carbon (PEC)
2) Primary $PM_{2.5}$.- Sulfate Particulate (PSO4)
3) The difference between total $PM_{2.5}$ and PEC, which ***was*** labeled "PM25OC"

The total $PM_{2.5}$ and PEC (from which the MOVES PM25OC was derived) were based on the Kansas City Study; the MOVES PSO4 was based on the fuel sulfur content. In our previous approach, we first subtracted PSO4 from PM25OC prior to further speciating it into the necessary CMAQ inputs.

When we tried to implement the same approach for draft MOVES for diesel vehicles, the $PM_{2.5}$ Sulfate exceeded the PM25OC. Therefore we chose not to subtract $PM_{2.5}$ Sulfate. Note that the diesel results did not come from the Kansas City study and the actual relationship between $PM_{2.5}$ Total Exh , $PM_{2.5}$ Organic C and PEC is not necessarily the same as in the Kansas City study.

It should also be noted, that for the gasoline approach, the sulfates included in the gasoline-based "PM25OC" would have been specific to Kansas City and very small. It is possible that in other parts of the country or that for different years, the sulfate is much larger and would be inconsistent with the "PM25OC" of the Kansas City study. As a result, it was decided at the OTAQ/OAQPS Inventory Coordination Team meeting on 25Feb2010, that in the interim we will no longer remove PSO4 mass from MOVES "PM25OC" **for neither gasoline nor diesel vehicles.**

In addition to the above changes, there were also changes to the values used for the speciation approach. Attachment 1 provides the details.

Ultimately, the plan is for MOVES to provide the species that CMAQ requires (potentially a 6 month timeframe). In the meantime, adjustments will continue be made in a post processing step of the MOVES outputs that we describe in this document.

Previous Approach using MOVES2010 for the Version 4.1 Platform ("cr" series and pre-HD GHG "cs" series)

Partially speciated $PM_{2.5}$ emissions for diesel vehicles were first introduced into the MOVES2010 runs and used for Version 4.1 of the 2005 Platform. We used the same equations (other than computation of PMC) to obtain the pre-temperature adjusted CMAQ $PM_{2.5}$ species for diesel and gasoline (only the computation of coarse particulate matter, PMC, was different between gasoline and diesel vehicles). These equations are the equations in section 4 that apply to gasoline vehicles. Thus, equation (7) is used to compute NH4 and equation (8) is not used at all.

The approach was changed by introducing equation (8) which zeroes out ammonium (NH4) for diesel vehicles instead of computing it stoichiometrically (equation 7). This was first implemented for post

processing the MOVES partially speciated PM emissions for the HD GHG modeling effort. The change was made because the v4.1 platform equations, when applied to diesel exhaust in some counties, resulted in negative POC due to the large fraction of sulfate and ammonium (NH4) resulting from the stoichiometric equation that relates ammonium mass to the mass of sulfate and nitrate. This stoichiomentric equation assumes that the NH4 balances the anions of sulfate and nitrate in the mix. However, this is not the case – in particular for diesel exhaust which has little or no ammonia and for which the sulfate is emitted as H2SO4 acid as opposed to ammonium sulfate.

Section 4 thus provides the updated approach.

Approach

The MOVES output provides total $PM_{2.5}$ and three components of $PM_{2.5}$: two pre-speciated components of $PM_{2.5}$ which are: 1) *PEC*, and 2) *PSO4*, and a non-speciated component termed "*PM25OM*", which is defined as the difference between total $PM_{2.5}$ and PEC.

It is important to note that *PM25OM* is not solely made up of organic matter, but is defined as the following:

$$\text{MOVES total } PM_{2.5} = \text{PEC} + \text{PM25OM} + \text{PSO4} \quad (1)$$

We can compute the CMAQ $PM_{2.5}$ species from (1) the MOVES2010 output pollutants: PEC, PSO4 and PM25OM, and (2) the speciation profile for total $PM_{2.5}$ exhaust. The equations used are presented below.

MOVES total $PM_{2.5}$ is the sum of the two pre-speciated components of $PM_{2.5}$ and a remainder term, *R*.

$$\text{MOVES total } PM_{2.5} = \text{PEC} + \text{PSO4} + R \quad (2)$$

The remainder term is the provided as a MOVES output

$$R = \text{PM25OM} \quad (3)$$

The *R* term includes POM, which consists of POC and the hydrogen and oxygen atoms attached to the carbon as part of the organic matter, PNO3, soil oxides and metals (also known as "crustal" and called METAL here), ammonium, and water, and thus can be also written as:

$$R = \text{POM} + \text{PNO3} + \text{METAL} + \text{NH4} + H_20 \quad (4)$$

To correctly calculate the five $PM_{2.5}$ species needed for CMAQ, we first needed to break out the POC, PNO3, and PMFINE from *R*. We can use the proportional relationship of known species to unknown species from the speciation profile. Note that there are different speciation profiles for gasoline vehicles, light duty diesel vehicles and heavy duty diesel vehicles. They are provided along with the corresponding data used for these calculations in Table 1.

The primary nitrate is computed based on the ratio of nitrate to elemental carbon, i.e., F_{NO3} / F_{EC} and metals component from the ratio of metals to elemental carbon, F_{METAL} / F_{EC} using equations (5) and (6), respectively.

$$\text{PNO3} = \text{PEC} \times F_{NO3} / F_{EC} \quad (5)$$

$$\text{METAL} = \text{PEC} \times F_{METAL} / F_{EC} \quad (6)$$

where,

F_{EC} = Fraction of elemental carbon in the speciation profile

F_{NO3} = Fraction of nitrate in the speciation profile

F_{METAL} = Fraction of metals in the speciation profile

Table 1 shows the values for the above fractions and the profiles from which they are to be derived.

Table 1: Values and basis for fractions used to compute PNO3 and METAL

Vehicle Type	SCC list	Speciation Profile Code and Name[1]	Profile Percentages
LDDV	All SCCs that begin with: 2230001 2230002 2230003 2230004 2230005 2230006	92042 LDDV Exhaust – Simplified 91017 LDDV Exhaust - Composite See Note 2	F_{EC} = 57.48051203% F_{NO3}= 0.23% F_{METAL}=0.6513%
HDDV	All SCCs that begin with: 223007	92035 HDDV Exhaust – Simplified 3914 Diesel Exhaust See Note 3	F_{EC} = 77.1241% F_{NO3}= 0.1141% F_{METAL} = 0.2757%
LDGV and HDGV	All SCCs that begin with 2201	92050 Onroad Gasoline Exhaust – Simplified 91022 Onroad Gasoline Exhaust - Composite	F_{EC} = 20.80113619% F_{NO3} = 0.1015% F_{METAL} = 2.2256%

NOTES

1. The values of F_{EC} and F_{NO3} are the same in the simplified and non-simplified profiles. The value for F_{METAL} was computed from the non-simplified profile as the sum of percentages of all ions of the metals and metal elements in the profile.
2. Previously (Attachment 1), for LDDV in the draft MOVES approach, we used the value of F_{NO3} and F_{METAL} from the HDDV profile. We changed so that all fractions for each species come from the LDDV
3. The value of F_{METAL} for HDDV previously used (Attachment 1) was corrected since it had inadvertently excluded the chloride ion percentage in the HDDV speciation profile.

As of 2/24/11 call with OTAQ experts, for diesel AND gasoline exhaust vehicles:

$$NH4 = 0 \quad (8)$$

The final component of PMFINE is the non-carbon mass of organic carbon. To calculate the non-carbon mass, we first needed to compute organic carbon from the remainder term, *R*.

A key assumption is that POM is a factor of 1.2 greater than the mass of primary organic carbon, which is also used in the CMAQ postprocessing software at EPA.

$$POM = 1.2 \times POC \quad (9)$$

Using this assumption and assuming that the H_20 is negligible, the equation needed for the calculation of POC is shown in equation (10) below.

$$POC = 5/6 \times (R - METAL - NH4 - PNO3) \quad (10)$$

From equation (9), the non-carbon portion of the organic carbon matter is 20%, of the POC. By definition, PMFINE is the sum of the non-carbon portion of the mass, METAL and NH4.

$$PMFINE = METAL + NH4 + 0.2 \times POC \quad (11)$$

For gasoline mobile sources, the PMC is 8.6% of the $PM_{2.5}$ mass

Gasoline vehicles only: $PMC = 0.086 \times (PMFINE + PEC + POC + PSO4 + PNO3)$

For diesel mobile sources, the PMC is 3.09% of the $PM_{2.5}$ mass

Diesel vehicles only: $PMC = 0.0309 \times (PMFINE + PEC + POC + PSO4 + PNO3)$

Implementation for when MOVES is run with actual temperatures

The MOVES pollutants of interest are summarized from the below table provided by OTAQ.

Pollutants

MOVES PollutantId	Data Transfer PollutantCode
101	PM10OM
102	PM10EC
105	PM10SO4
111	PM25OM
112	PM25EC
115	PM25SO4

The purpose of the equations in Section 5 is to fully speciate the MOVES2010 partially-speciated EXHAUST $PM_{2.5}$ to create the model species needed for CMAQ. The equations apply to PM from all exhaust processes.

The equations below utilize the following MOVES 2010 outputs
PM25EC, which is identical to the elemental carbon portion of $PM_{2.5}$, or PEC
PM25SO4, which is identical to the sulfate portion of $PM_{2.5}$, or PSO4
PM25OM, which contains all components of $PM_{2.5}$ other than PEC and PSO4.

For gasoline vehicles, MOVES applies a temperature adjustment factor that accounts for the impact of cold temperatures on PM25OM and PM25EM with decreasing temperature at temperatures below 72 °F. At 72 °F or higher, there is no dependency of any component of $PM_{2.5}$ on temperature. There is also no dependency of any component of $PM_{2.5}$ on temperature for diesel vehicles. At temperatures lower than 72 °F, the temperature dependence is different for start emissions (including crankcase starts) versus running emissions (including crankcase running).

Not all components of $PM_{2.5}$ for gasoline vehicles are a function of temperature. The following table shows the components and their temperature dependence. The components shown in red font are four of the five $PM_{2.5}$ species used in CMAQ; the other species shown in black font are used to compute the fifth CMAQ species, PMFINE.

$PM_{2.5}$ components that can vary with temperature, gasoline vehicles	**$PM_{2.5}$ components that do not vary with temperature**
PEC, POC, non-carbon organic matter	PSO4, PNO3, NH4, METAL
Because PMFINE is the sum of temperature adjusted and non-temperature adjusted components, it is a function of temperature.	

For gasoline vehicles, the unadjusted PEC is needed to compute the components of $PM_{2.5}$ that are not impacted by temperature. We denote unadjusted PEC as:
PEC_72

There are two ways to determine PEC_72:

1. Run MOVES at 72 °F or higher.

2. Calculate it by "backing out" the temperature adjustment from the adjusted MOVES PEC. This is done by dividing PEC by the MOVES cold temperature adjustment factor, PEC_Tadj: **PEC_72 = PEC/ PEC_Tadj**

The approach chosen for SMOKE MOVES is to back out the adjustment factor, because it eliminates the need to specify a temperature bin for the MOVES runs that is greater than or equal to 72 °F.

MOVES uses the following for PEC_Tadj
Diesel vehicles: PEC_Tadj = 1
Gasoline vehicles: PEC_Tadj is determined based on type of exhaust and temperature (in °F) using the values the below table.

Vehicle Type	**Temperature Range, T (°F)**	**PEC_Tadj for start emissions (including crankcase start), gasoline vehicles**	**PEC_Tadj for running emissions (including crankcase running), gasoline vehicles**
Gasoline vehicles	T<72 °F	28.039*exp(-0.0463*T)	9.871*exp(-0.0318*T)
	72 °F or higher	1.0	1.0
Diesel vehicles	All Temperatures	1.0	1.0

The equations are

(1) PEC = PM25EC

(2) PEC_72 = PEC / PEC_Tadj

(3) PSO4 = PM25SO4

(4) PNO3 = PEC_72 × *FNO3 / FEC*

(5) METAL = PEC_72 × *FMETAL / FEC*

(6) Compute NH4

a. For GASOLINE Vehicles: NH4 = 0

b. For DIESEL Vehicles: NH4=0

(7) POC = 5/6 × (PM25OM – METAL – NH4 – PNO3)

(8) PMFINE = METAL + NH4 + 0.2 × POC

(9) PMC = ($R_{PM10\text{-}to\text{-}PM25}$*-1)* × (PMFINE + PEC + POC + PSO4 + PNO3)

where

<table>
<tr><td>PEC</td><td>Mass of Primary elemental carbon, a species needed for the air quality model</td></tr>
<tr><td>PEC_72</td><td>Mass of Primary elemental carbon when MOVES is run at 72 °F or higher temperature; calculated by backing out the temperature adjustment factor, PEC_Tadj</td></tr>
<tr><td>PEC_Tadj</td><td>For diesel vehicle SCCs: PEC_Tadj= 1
For gasoline vehicle SCCs:
<table>
<tr><th>Temperature Range, T (°F)</th><th>PEC_Tadj for start emissions (including crankcase start), gasoline vehicles</th><th>PEC_Tadj for running emissions (including crankcase running), gasoline vehicles</th></tr>
<tr><td>T<72 °F</td><td>28.039*exp(-0.0463*T)</td><td>9.871*exp(-0.0318*T)</td></tr>
<tr><td>72 °F or higher</td><td>1.0</td><td>1.0</td></tr>
</table></td></tr>
<tr><td>gasoline SCCs</td><td>All SCCs that begin with 2201</td></tr>
<tr><td>diesel SCCs</td><td>All SCCS that begin with 2230</td></tr>
<tr><td>PM25EC</td><td>Mass of Primary elemental carbon provided by the MOVES model</td></tr>
<tr><td>PM25SO4</td><td>Mass of Primary sulfate provided by the MOVES model</td></tr>
<tr><td>PSO4</td><td>Mass of Primary sulfate, a species needed for the air quality model</td></tr>
<tr><td>PNO3</td><td>Mass of Primary nitrate, a species needed for the air quality model</td></tr>
<tr><td>METAL</td><td>Mass of metal component of $PM_{2.5}$, which is a component of PMFINE</td></tr>
<tr><td>FNO3, FEC, FMETAL</td><td>Percentages of nitrate, elemental carbon and derived from the vehicle-type-specific speciation profile, values are provided in Table 1</td></tr>
<tr><td>NH4</td><td>Mass of ammonium component of $PM_{2.5}$, which is a component of PMFINE
Note that this is assumed 0 for both gasoline and diesel exhaust as of 2/24/11</td></tr>
<tr><td>62.0049</td><td>Molecular weight of nitrate</td></tr>
<tr><td>96.0576</td><td>Molecular weight of sulfate</td></tr>
<tr><td>18.0383</td><td>Molecular weight of ammonium</td></tr>
<tr><td>POC</td><td>Mass of Primary organic carbon, a species needed for the air quality model</td></tr>
<tr><td>PM25OM</td><td>Mass of organic material provided by the MOVES model, actually includes more than organic matter; it includes the mass of all components of $PM_{2.5}$ other than PEC and PSO4</td></tr>
<tr><td>PMFINE</td><td>Mass of other Primary $PM_{2.5}$ not accounted for in PEC, POC, PSO4 and PNO3, a species needed for the air quality model. This mass includes the ammonium, metals, water and the and the mass of the non-carbon material, i.e., hydrogen and oxygen and other atoms attached to the organic carbon</td></tr>
<tr><td>PMC</td><td>Mass of the coarse fraction of the PM10; defined as PM10 – $PM_{2.5}$, a species needed for CMAQ</td></tr>
<tr><td>$R_{PM10\text{-}to\text{-}PM25}$</td><td>Ratio of PM10-to-$PM_{2.5}$ which is a constant dependent upon fuel type
Values are provided in Table 1</td></tr>
</table>

Quality Assurance Check:
EXH_PM25 = PMFINE + PEC + POC + PSO4 + PNO3

Table 1 has the values for *FNO3*, *FEC* and *FMETAL and* $R_{PM10\text{-}to\text{-}PM25}$
They are based on the vehicle type (first 7 digits of the SCC), except that $R_{PM10\text{-}to\text{-}PM25}$ is based solely on fuel type.

Table 1: Values and basis for fractions used to compute PNO3 and METAL

Vehicle Type	**SCC list**	*FEC (%)*	*FNO3 (%)*	*FMETAL (%)*	$R_{PM10\text{-}to\text{-}PM25}$
LDDV	All SCCs that begin with: 2230001, 2230002, 2230003, 2230004, 2230005, 2230006	57.48051203	0.23	0.6513	1.0309
HDDV	All SCCs that begin with: 223007	77.1241	0.1141	0.2757	1.0309
LDGV and HDGV	All SCCs that begin with 2201	20.80113619	0.1015	2.2256	1.086

Implementation for when MOVES-based emissions at 72 Fahrenheit are Input into SMOKE

The equations below utilize the following MOVES 2010 outputs:
PM25OM
PM25EC
PM25SO4

However, EXH_PM25 can be used for QA

All red-fonted variables are fed into SMOKE
All blue-fonted varilables are from MOVES output
Table 1 (Section 4) provides the values of the constants (italics): *FNO3, FEC, FMETAL and* $R_{PM10\text{-}to\text{-}PM25}$*-1*

The equations are

(1) PEC_72 = PM25EC
(2) PSO4 = PM25SO4
(3) PNO3 = PEC_72 × *FNO3 / FEC*
(4) METAL = PEC_72× *FMETAL / FEC*
(5) Compute NH4
a. For GASOLINE Vehicles: NH4 = 0 (~~PNO3/**62.0049** +2 × PSO4/**96.0576**) × **18.0383**~~
b. For DIESEL Vehicles
NH4=0
(6) POC_72 = 5/6 × (PM25OM – METAL – NH4 – PNO3)
(7) OTHER = METAL+NH4

Temperature adjustments are made to the SMOKE intermediate files to produce POC and PEC. That program also computes the remainder of the species that are needed prior to the final SMOKE merge using the adjusted POC and PEC and other intermediate species.. These species are shown in green font.

(8) **POC** = Look-up-table_Function (Temperature, POC_72)
(9) **PEC** = Look-up-table_Function (Temperature, PEC_72)
Note that OTHER, PNO3 and PSO4 are not temperature-adjusted and come directly from the SMOKE intermediate files
(10) **PMFINE** = OTHER + 0.2 × POC
(11) **PMC** = ($R_{PM10\text{-}to\text{-}PM25}$*-1)* × (PMFINE + PEC + POC + PSO4 + PNO3)

ATTACHMENT 1

Fractions of Utilized in Draft MOVES approach and rationale for the changes for MOVES 2010

PNO3 = PEC × *FNO3 / FEC*
METAL = PEC × *FMETAL / FEC*

Vehicle/ SCCs	**FNO3 value and basis**	**FEC value and basis**	**FMETAL value and basis**
LDDV: 2230001000 through 2230060334	0.1141% Based on **HDDV** speciation profile (92035-simplified, 3914-composite containing all species). NOTE: Agreed that it is more technically sound to use the LDDV profile for all LDDV fractions. Will change to use LDDV (92042 simplified, 91017, composite) the value is 0.23%	57.4805% Based on LDDV speciation profile (92042 simplified, 91017, composite)	0.2663% based on Value provided by Catherine Yanca and Joe Somers to OAQPS in email provided 11/6/2009. It was based on the HDDV profile (3914) NOTE: Agreed that it is more technically sound to use the LDDV profile for all LDDV fractions. Will change to 0.6513% , that Madeleine computed using LDDV profile 91017
HDDV: 2230071110 through 2230075330	0.1141% Based on HDDV speciation profile (92035-simplified, 3914-composite containing all species).	77.1241% Based on HDDV speciation profile (92035-simplified, 3914-composite containing all species).	0.2663% based on Value provided by Catherine Yanca and Joe Somers to OAQPS in email provided 11/6/2009 "Equations for diesel MOVES speciation use in CMAQ 110609.doc" NOTE: Will change to 0.2757% , that Madeleine computed using 3914. The difference is that the chloride ion percent was inadvertently left out of the 0.2663% value
LDGV and HDGV 2201001 through 220107	0.1015% based on 92050 simplified, 91022-composite	20.80113619% based on 92050 simplified, 91022-composite	2.2256% based on 91022-composite

Updates/FIXES

March 16, 2010 updated from March 11 version to use a different constant to generate PMC from $PM_{2.5}$ for gasoline versus diesel vehicles and to provide a table of variable names under section 4

March 26, 2010 Fixed Table 1, last row 2nd column. All SCCs that begin with 2201 are LDGV and HDGV. (not 2202001)

April 7, 2010. Section 4. Replaced "These equations are used only when Etype has the values RUNEXH and STARTEXH." With "**The equations apply to PM from all exhaust processes."** Per the email Michele Jiminez sent to Marc Houyoux on 4/5/2010 that indicates that in addition to **Running Exhaust** and **Start Exhaust** MOVES includes processes

Crankcase Running Exhaust
Crankcase Start Exhaust
Crankcase Extended Idle Exhaust
Extended Idle Exhaust

June 4 2010: Section 4: the equations for gasoline SCCs were changed to use non-temperature-adjusted PEC in the calculations for PNO3 and METAL. Note that diesel SCCs can use the same equations or use the temp adjusted values since for diesel, they are the same.

July 7, 2010: Section 4: Equations added to compute non-temperature adjusted PEC in terms of the MOVES adjustment factor. Also provided the formula for the temperature adjustment factor (needed to compute the non-temperature adjusted PEC). This formula is specific to MOVES2010.
Also added text explanation indicating which particular $PM_{2.5}$ components are temperature dependent and which are not.

July 15, 2010. Section 4: Changed the temperature ranges for the adjustment factor. MOVES does not have a maximum value of the temperature adjustment factor, PEC_Tadj, and will thus continue to increase at values below -20 °F. There are now just two temperature ranges for the factor for gasoline vehicles: (1) below 72 °F and (2) greater-or-equal to 72 °F.

February 23: NH4 =0 for diesel vehicles. Reason: there is very little NH3 from diesel vehicles. Likely the sulfate and nitrate anions are balanced by hydrogen ions (as opposed to NH4). We did not compute the mass of these hydrogen ions (which would be a component of PMFINE) because we believe they are very small and would not make an appreciable difference on the speciation, given the other assumptions being made with regards to relative components of metals and nitrate to elemental carbon.

February 24: NH4 = 0 for gasoline vehicles. Reason: OTAQ chemistry experts (Joe Summers, Rich Cook and Catherine Yanca) all agree that it makes no sense to include NH4 for gasoline exhaust. NH4 for gasoline exhaust was much smaller relative to its computed value for diesel exhaust so this will have little impact on increasing POC and decreasing PMFINE.

Appendix E: List of CoST Packets Used to Project Non-EGU Stationary and c1c2rail Sectors to 2020

This Appendix lists the control, projection and closure packet databases used to project *some (but not all)* of the 2007 base case inventories to create the 2020 future year base case inventories. These packets were processed for the CoST (Control Strategy Tool) application but they are consistent with the SMOKE input format. We use CoST to create 2020 base case from 2007 base case inventories for our non-EGU stationary (ptnonipm, nonpt, ag and afdust sectors) and c1c2rail sector inventories. The 2007 base case and resulting 2020 base case inventories are listed in Appendix G.

Table E-1 lists all packets used for ptnonipm sector year-2020 development. These packets impact the following ptnonipm (non-EGU point sources) sector inventories:

- 2008NEI_v2_POINT_20120202_for2007ee_ptnonipm_stackfix_FF10_nz
- ptinv_SD_ptnonipm_xportfrac_caphap2005v2_2005cs_plus_ethanol_plants_2005ct_FF10
- 2006_WRAP_PhaseIII_OIL_GAS_Point (V2)
- 2007_Nonhourly_Jan2012_VA_MEADWESTVACO_PACKAGING

Inventories are version zero (V0) unless indicated; here, the WRAP Phase III oil and gas inventory is version 2. None of the packets in Table E-1 impact the 2007 base case ptnonipm inventory "2008NEI_v1_7_ptnonipm_Utah_Rowley_HAPs_FF10".

Table E-2 lists all packets used for the nonpt, afdust and c1c2rail sectors for year-2020 development. Table E-2 also indicates the sectors impacted by each packet. Note that the afdust, ag and c1c2rail sectors each require only one PROJECTION packet to create year 2020 inventories. These packets impact the following nonpt sector inventories:

- 2008NEI_v2_NONPOINT_nonpt_remaining_run5_fixed_OHH_ff10
- 2006_WRAP_PhaseIII_OIL_GAS_Area (V1)
- RWC_3SCCs_LADCO2008_fixed_ff10
- NYPA_RWC_2007_fixed_ff10
- SESARM_RWC_2007_fixed_ff10

The following nonpt sector 2007 inventories are not impacted by these packets:

- 2008_agburn_fromdaily_FF10_22feb2012
- MARAMA_open_burning_2007
- openburning_landclearing_FLGA_sesarm2007_ff10 (V2)
- 2008NEI_v2_NONPOINT_PFC

The packet in Table E-2 impacts the following afdust sector inventories:

- 2008NEI_v2_NONPOINT_afdust_nopavedroads_noRPO_FF10
- 2008NEI_v2_NONPOINT_afdust_NY_agproduction_ONLY_FF10
- marama_afdust_2007_Jan2012_for2007ed
- sesarm_afdust_semap_March2012_for2007ed

The afdust inventory "afdust_paved_roads_2008v17_noPRECIPadj_FF10" is not impacted by these packets.

The packet in Table E-2 impacts both ag sector inventories:

2008NEI_v2_NONPOINT_ag_noLADCO_FF10

- mwrpo_agnh3_baseCv7_for2007ed_FF10

The packet in Table E-2 impacts the following c1c2rail sector inventories:

- 2008_EPAonly_NONPOINT_20120211_TXrail
- 2008NEI_v2_NONPOINT_rail_noRPO_FF10 (V1)
- c1c2_cmv_NEI2008v2_RPO2007_SLT1_TX_CA_withPMadj (V1)
- rail_ONLY_RPO2007

The packet in Table E-2 is not applied to the 2007 California inventory "2007ee_california_c1c2rail_annual_ff10_revised" because CARB provided year 2020 emissions (see Section 4.3.3).

These CoST packets are available in a zip file "2020re_CoST_Packets_for_2007v5platform.zip" on the 2007v5 website: Clearinghouse for Inventories and Emissions Factors (CHIEF) under the link "2007 and 2020 Emissions Data Files and Summaries".

National summaries of the impacts of these packets on each of these inventories are provided in Appendix F.

Table E-1. Datasets used to create 2020 base case ptnonipm sector inventories

File Name	Type	Description	Section
closures_2012ck_2008NEIv2.csv	Plant Closure	Facility closures obtained prior to 2008	4.2.9
CLOSURES_EIS_2008NEIv2_09aug2012_v2	Plant Closure	Facility closures obtained by EIS query of facility status as of early 2012	4.2.9
CLOSURES_OAQPS_emv4_2_2008NEIv2_01aug2012_v1	Plant Closure	Facility and unit closures obtained from EPA staff through late 2010	4.2.9
closures_TR1_2008NEIv2.csv	Plant Closure	Facility and unit closures obtained from CSAPR comments	4.2.8
CLOSURES_cement_ISIS_2007v5_2013policy_07aug2012.csv	Plant Closure	Unit/kiln closures from the Portland Cement NESHAP and NSPS ISIS policy case	4.2.6
CONTROL_SULF_2020_2007v5_30JUL2012.txt	Control	SO2 reductions due to state sulfur fuel content rules for fuel oil	4.2.4
CONTROL_RICE_incl_SO2_2007v5_26JUL2012.txt	Control	Controls that represent RICE NESHAP rules with amendments and ULSD requirements for CI engines	4.2.3
CONTROL_BlrMACT_ptnonipm_2020_2007v5_02aug2012.txt	Control	Controls that represent ICI boilers and process heaters non-EGU point reductions (Boiler MACT) with December 2012 Reconsiderations	4.2.5
CONTROL_CISWI_2007v5_08aug2012.txt	Control	Controls that represent CISWI revised NSPS	4.2.10.8
controls_CSAPR_2008NEIv2.csv	Control	Controls that represent consent decrees from Final CSAPR (2005) emissions modeling platform	4.2.8
CONTROL_CSAPR_ptnonipm_2020_2007v5_31jul2012.txt	Control	Controls that represent comments for Final CSAPR (2005) emissions modeling platform	4.2.8
CONTROL_HWI_2007v5_06aug2012.txt	Control	Controls that represent HWI Phase I and II	4.2.10.8
CONTROL_LaFarge_StGobain_2007v5_08aug2012_v1	Control	Controls related to consent decrees at Lafarge and Saint Gobain facilities	4.2.10.5
CONTROL_MACT_BoatManuf_2007v5_03aug2012.txt	Control	Controls that represent boat manufacturing MACT rule	4.2.10.4
CONTROLS_NYSIP_VOC_2007v5.csv	Control	Controls that reflect enforceable NY ozone SIP NO_X and VOC reductions	4.2.10.3
controls_OECA_2008NEIv2.csv	Control	Controls that reflect multi-facility consent decrees obtained from OECA	4.2.10.6
CONTROLS_Refineries_additional_consent_2008NEIv2_09aug2012_v1	Control	Controls that represent refinery consent decrees, obtained from EPA's SPPD	4.2.10.7
CONTROL_IndBoilers_nonMACT_by2008_2007v5.csv	Control	Wet scrubber control on a boiler not associated with the Boiler MACT	4.2.10.2
PROJECTION_ISIS2013_cement_2007v5_08aug2012.txt	Projection	Kiln adjustments from the Portland Cement NESHAP and NSPS ISIS policy case	4.2.6
PROJECTION_2008_2020_aircraft_24JUL2012.txt	Projection	Aircraft projection factors derived from FAA Terminal Area Forecast System itinerant data	4.2.10.1
PROJECTION_2008_2020_distribution_upstream_OTAQ_31JUL2012.txt	Projection	Adjustments that reflect VOC vapor losses from RFS2 impact on storage and transport of ethanol	4.2.1.6

File Name	Type	Description	Section
PROJECTION_2008_2020_refineries_upstream_OTAQ_31JUL2012.txt	Projection	Adjustments to refineries due to RFS2 impacts on gasoline and diesel fuel production	4.2.1.7
PROJECTION_CSAPR_WVunit_ptnonipm_2020_2007v5_31jul2012.txt	Projection	Adjustment factor to reflect conversion (shutdown) of WV coal boiler with natural gas unit. New unit emissions assigned to existing unit	4.2.8
PROJECTION_2008_2020_ag_including_upstream_OTAQ_26JUL2012.txt	Projection	Adjustment factors for animal and fertilizer ag sector and upstream RFS2-related adjustments for ag-related activity such as fertilizer and pesticide production, ag tilling, and livestock dust and waste	4.2.2

Table E-2. Datasets used to create 2020 base case afdust, ag, c1c2rail and nonpt sector inventories

Filename	Type	Description	Section	Sector(s)
CONTROL_SULF_2020_2007v5_30JUL2012.txt	Control	SO_2 reductions due to state sulfur fuel content rules for fuel oil	4.2.4	nonpt
CONTROL_RICE_incl_SO2_2007v5_26JUL2012.txt	Control	Controls that represent RICE NESHAP rules with amendments and ULSD requirements for CI engines	4.2.3	nonpt
CONTROL_CSAPR_nonpoint_2020_2007v5_01aug2012.txt	Control	Controls that represent comments for Final CSAPR (2005) emissions modeling platform	4.2.8	nonpt
CONTROLS_NYSIP_VOC_2007v5.csv	Control	Controls that reflect enforceable NY ozone SIP NO_X and VOC reductions	4.2.10.3	nonpt
PROJECTION_2008_2020_distribution_upstream_OTAQ_31JUL2012.txt	Projection	Adjustments that reflect VOC vapor losses from RFS2 impact on storage and transport of ethanol	4.2.1.6	nonpt
PROJECTION_2008_2020_RWC_27JUL2012.txt	Projection	Adjustments to RWC by appliance type based on expected future sales and replacements	4.2.7	nonpt
PROJECTION_2008_2020_ag_including_upstream_OTAQ_26JUL2012.txt	Projection	Adjustment factors for animal and fertilizer ag sector and upstream RFS2-related adjustments for ag-related activity such as fertilizer and pesticide production, ag tilling, and livestock dust and waste	4.2.2	afdust, ag, nonpt
PROJECTION_2008_2020_c1c2rail_01aug2012.txt	Projection	Non-California adjustment factors that represent relative impact of the final loco-marine rule	4.3.3	c1c2rail

Appendix F: Summary of Future Base Case Non-EGU CoST Packets Containing Control Programs, Closures and Projections

This Appendix provides national summaries of the impacts of the CONTROL, PROJECTION and plant CLOSURE packets used by CoST to create the 2020 future-year base case inventories for the ptnonipm, nonpt, afdust, ag and c1c2marine sectors. These summaries are for sector totals; we summed the emissions and reductions/growth over all inventories in each sector. As described in Appendix E, some, but not all inventories in each sector are subject to CoST packets. In some cases, the inventories are simply not affected by any control program, adjustment or closure. However, some inventories are also replaced wholesale for the 2020 base case. For example, California c1c2marine emissions were provided by CARB for both 2007 and 2020; therefore, we did not apply the c1c2marine CoST packet to the 2007 CARB data to create a projected 2020 CARB c1c2marine inventory. Appendix E lists the inventories that are subject to CoST packets as well as those that are not.

The summaries in these tables represent the sum of emissions for only those inventories impacted by CoST packets. That is, the 2007 and 2020 emissions provided here are NOT sector total emissions. Sector total emissions are provided in Section 5 of the 2007v5 documentation. These summaries only show the 2007 and 2020 emissions (and changes) for those inventories impacted by CoST packets. Table F-1 provides the national summary impacts for the ptnonipm sector. Tables F2 through F5 provide national summary impacts for the nonpt, afdust, ag and c1c2marine sectors, respectively. Emissions reductions in these tables represent 2007 emissions minus 2020 emissions and are positive when emissions are less in 2020. Percent reductions are computed as this difference divided by the 2007 emissions. The CoST packets in the first column roughly translate to the files listed in the tables in Appendix E.

Table F-1. Summary of 2007 and 2020 base case ptnonipm sector inventories impacted by CoST packets

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
CLOSURES 2012ck 2008NEIv2	CO	107	0	107	100.0%
CLOSURES 2012ck 2008NEIv2	NH_3	7	0	7	100.0%
CLOSURES 2012ck 2008NEIv2	NO_X	117	0	117	100.0%
CLOSURES 2012ck 2008NEIv2	PM_{10}	30	0	30	100.0%
CLOSURES 2012ck 2008NEIv2	$PM_{2.5}$	26	0	26	100.0%
CLOSURES 2012ck 2008NEIv2	SO_2	67	0	67	100.0%
CLOSURES 2012ck 2008NEIv2	VOC	56	0	56	100.0%
CLOSURES cement ISIS 2008NEIv2	CO	40,434	0	40,434	100.0%
CLOSURES cement ISIS 2008NEIv2	NH_3	257	0	257	100.0%
CLOSURES cement ISIS 2008NEIv2	NO_X	76,789	0	76,789	100.0%
CLOSURES cement ISIS 2008NEIv2	PM_{10}	3,069	0	3,069	100.0%
CLOSURES cement ISIS 2008NEIv2	$PM_{2.5}$	1,792	0	1,792	100.0%
CLOSURES cement ISIS 2008NEIv2	SO_2	54,958	0	54,958	100.0%
CLOSURES cement ISIS 2008NEIv2	VOC	5,275	0	5,275	100.0%
CLOSURES EIS 2008NEIv2	CO	6,532	0	6,532	100.0%
CLOSURES EIS 2008NEIv2	NH_3	91	0	91	100.0%
CLOSURES EIS 2008NEIv2	NO_X	5,782	0	5,782	100.0%
CLOSURES EIS 2008NEIv2	PM_{10}	3,399	0	3,399	100.0%
CLOSURES EIS 2008NEIv2	$PM_{2.5}$	2,521	0	2,521	100.0%
CLOSURES EIS 2008NEIv2	SO_2	4,821	0	4,821	100.0%
CLOSURES EIS 2008NEIv2	VOC	10,397	0	10,397	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	CO	20,517	0	20,517	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	NH_3	297	0	297	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	NO_X	5,029	0	5,029	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	PM_{10}	3,598	0	3,598	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	$PM_{2.5}$	2,724	0	2,724	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	SO_2	20,364	0	20,364	100.0%
CLOSURES OAQPS emv4.2 2008NEIv2	VOC	3,104	0	3,104	100.0%
CLOSURES TR1 comments and consent decrees 2008NEIv2	CO	22,167	0	22,167	100.0%
CLOSURES TR1 comments and consent decrees 2008NEIv2	NH_3	26	0	26	100.0%

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
CLOSURES TR1 comments and consent decrees 2008NEIv2	NO_X	8,775	0	8,775	100.0%
CLOSURES TR1 comments and consent decrees 2008NEIv2	PM_{10}	1,871	0	1,871	100.0%
CLOSURES TR1 comments and consent decrees 2008NEIv2	$PM_{2.5}$	1,265	0	1,265	100.0%
CLOSURES TR1 comments and consent decrees 2008NEIv2	SO_2	49,905	0	49,905	100.0%
CLOSURES TR1 comments and consent decrees 2008NEIv2	VOC	1,514	0	1,514	100.0%
CONTROL 2007v5: 2008 to 2018-2029 SULF rules	SO_2	5,032	1,020	4,011	79.7%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	CO	186,616	172,060	14,556	7.8%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	NO_X	261,157	255,450	5,707	2.2%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	PM_{10}	2,560	2,172	388	15.1%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	$PM_{2.5}$	2,438	2,069	369	15.1%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	SO_2	3,144	1,580	1,564	49.8%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	VOC	44,184	36,802	7,382	16.7%
CONTROL 2007v5: Boiler MACT with defaults	CO	289,531	69,042	220,489	76.2%
CONTROL 2007v5: Boiler MACT with defaults	PM_{10}	45,144	12,685	32,459	71.9%
CONTROL 2007v5: Boiler MACT with defaults	$PM_{2.5}$	36,061	10,311	25,749	71.4%
CONTROL 2007v5: Boiler MACT with defaults	SO_2	461,167	37,324	423,843	91.9%
CONTROL 2007v5: Boiler MACT with defaults	VOC	19,925	6,817	13,108	65.8%
CONTROL 2007v5: CISWI	$PM_{2.5}$	287	150	136	47.6%
CONTROL 2007v5: CISWI	SO_2	4,169	648	3,520	84.5%
CONTROL 2007v5: CSAPR consent decrees	CO	361	169	192	53.3%
CONTROL 2007v5: CSAPR consent decrees	NO_X	10,708	6,581	4,128	38.5%
CONTROL 2007v5: CSAPR consent decrees	PM_{10}	674	209	465	69.0%
CONTROL 2007v5: CSAPR consent decrees	$PM_{2.5}$	630	202	428	67.9%
CONTROL 2007v5: CSAPR consent decrees	SO_2	45,295	7,940	37,355	82.5%
CONTROL 2007v5: CSAPR ptnonipm to 2020	NO_X	2,900	1,857	1,042	35.9%
CONTROL 2007v5: CSAPR ptnonipm to 2020	$PM_{2.5}$	6	3	3	54.0%
CONTROL 2007v5: CSAPR ptnonipm to 2020	SO_2	6,261	2,149	4,112	65.7%
CONTROL 2007v5: HWI	PM_{10}	6,890	1,986	4,905	71.2%
CONTROL 2007v5: HWI	$PM_{2.5}$	5,841	1,735	4,106	70.3%
CONTROL 2007v5: LaFarge and St. Gobain	NO_X	10,407	4,119	6,289	60.4%
CONTROL 2007v5: LaFarge and St. Gobain	PM_{10}	324	3	321	99.0%

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
CONTROL 2007v5: LaFarge and St. Gobain	$PM_{2.5}$	309	15	294	95.0%
CONTROL 2007v5: LaFarge and St. Gobain	SO_2	2,672	543	2,129	79.7%
CONTROL 2007v5: MACT, Boat Manufacturing	VOC	1,300	884	416	32.0%
CONTROL 2007v5: NYSIP to 2020	NO_X	1,767	530	1,237	70.0%
CONTROL 2007v5: OECA consent decrees	CO	10,218	231	9,987	97.7%
CONTROL 2007v5: OECA consent decrees	NO_X	29,801	17,281	12,519	42.0%
CONTROL 2007v5: OECA consent decrees	PM_{10}	4,044	2,823	1,221	30.2%
CONTROL 2007v5: OECA consent decrees	$PM_{2.5}$	3,565	2,499	1,066	29.9%
CONTROL 2007v5: OECA consent decrees	SO_2	14,733	5,311	9,422	63.9%
CONTROL 2007v5: OECA consent decrees	VOC	2,376	1,226	1,149	48.4%
CONTROL 2007v5: pre-2008 Industrial Boiler nonMACT	SO_2	1,802	338	1,464	81.3%
CONTROL 2007v5: Refineries additional consent decrees	NO_X	1,957	1,064	893	45.6%
CONTROL 2007v5: Refineries additional consent decrees	SO_2	278	120	157	56.7%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	CO	5,883	8,713	-2,830	-48.1%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	NH_3	13	77	-64	-481.4%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	NO_X	79,790	57,477	22,313	28.0%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	PM_{10}	3,552	1,005	2,546	71.7%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	$PM_{2.5}$	1,897	800	1,097	57.8%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	SO_2	43,318	22,287	21,031	48.5%
PROJECTION 2007v5: 2008 to 2013 ISIS cement policy	VOC	1,679	1,131	548	32.6%
PROJECTION 2007v5: 2008 to 2020 Aircraft	CO	550,024	550,697	-674	-0.1%
PROJECTION 2007v5: 2008 to 2020 Aircraft	NO_X	133,157	147,537	-14,380	-10.8%
PROJECTION 2007v5: 2008 to 2020 Aircraft	PM_{10}	10,898	10,835	63	0.6%
PROJECTION 2007v5: 2008 to 2020 Aircraft	$PM_{2.5}$	4,964	5,208	-244	-4.9%
PROJECTION 2007v5: 2008 to 2020 Aircraft	SO2	13,331	14,680	-1,349	-10.1%
PROJECTION 2007v5: 2008 to 2020 Aircraft	VOC	38,806	40,248	-1,442	-3.7%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Distribution	VOC	42,453	40,877	1,576	3.7%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	CO	83,306	80,879	2,426	2.9%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	NH_3	3,008	2,822	186	6.2%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	NO_X	92,586	90,979	1,608	1.7%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	PM_{10}	26,729	26,167	562	2.1%

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	$PM_{2.5}$	23,732	23,083	649	2.7%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	SO_2	143,900	139,806	4,094	2.8%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Refineries	VOC	65,668	63,282	2,386	3.6%
PROJECTION 2007v5: CSAPR WV unit	NO_X	7	35	-28	-370.4%
PROJECTION 2007v5: CSAPR WV unit	PM_{10}	1	3	-2	-370.8%
PROJECTION 2007v5: CSAPR WV unit	$PM_{2.5}$	1	3	-2	-370.8%
PROJECTION 2007v5: CSAPR WV unit	SO2	0	0	0	-370.9%
PROJECTION 2008 to 2020 ag emissions	CO	2,053	2,155	-102	-5.0%
PROJECTION 2008 to 2020 ag emissions	NH_3	12,254	12,909	-655	-5.3%
PROJECTION 2008 to 2020 ag emissions	NO_X	9,138	9,597	-459	-5.0%
PROJECTION 2008 to 2020 ag emissions	PM_{10}	3,084	3,240	-156	-5.1%
PROJECTION 2008 to 2020 ag emissions	$PM_{2.5}$	2,188	2,298	-110	-5.0%
PROJECTION 2008 to 2020 ag emissions	SO_2	289	300	-12	-4.0%
PROJECTION 2008 to 2020 ag emissions	VOC	864	875	-11	-1.3%

Table F-2. Summary of 2007 and 2020 base case nonpt sector inventories impacted by CoST packets

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
CONTROL 2007v5: 2008 to 2018-2029 SULF rules	SO_2	87,706	831	86,875	99.1%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	CO	238,358	227,052	11,306	4.7%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	NO_X	353,423	349,523	3,901	1.1%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	PM_{10}	4,280	3,892	388	9.1%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	$PM_{2.5}$	3,543	3,211	332	9.4%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	SO_2	54,865	51,161	3,704	6.8%
CONTROL 2007v5: 2008 to 2020 RICE including SO2	VOC	23,909	20,661	3,248	13.6%
CONTROL 2007v5: CSAPR nonpt to 2020	VOC	8,127	6,709	1,418	17.4%
CONTROL 2007v5: NYSIP to 2020	VOC	69,239	33,525	35,714	51.6%
PROJECTION 2007v5: 2008 to 2020 OTAQ upstream Distribution	VOC	540,432	535,018	5,415	1.0%
PROJECTION 2008 to 2020 ag emissions	PM_{10}	26,200	26,118	81	0.3%
PROJECTION 2008 to 2020 ag emissions	$PM_{2.5}$	7,332	7,288	43	0.6%
PROJECTION 2008 to 2020 ag emissions	VOC	91,146	90,948	198	0.2%
PROJECTION 2007v5: 2008 to 2020 RWC emissions	CO	1,803,158	2,069,726	-266,567	-14.8%

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
PROJECTION 2007v5: 2008 to 2020 RWC emissions	NH_3	15,039	17,522	-2,483	-16.5%
PROJECTION 2007v5: 2008 to 2020 RWC emissions	NO_X	25,800	31,923	-6,123	-23.7%
PROJECTION 2007v5: 2008 to 2020 RWC emissions	PM_{10}	252,844	294,365	-41,521	-16.4%
PROJECTION 2007v5: 2008 to 2020 RWC emissions	$PM_{2.5}$	252,180	293,338	-41,158	-16.3%
PROJECTION 2007v5: 2008 to 2020 RWC emissions	SO_2	6,093	8,141	-2,048	-33.6%
PROJECTION 2007v5: 2008 to 2020 RWC emissions	VOC	285,069	301,294	-16,225	-5.7%

Table F-3. Summary of 2007 and 2020 base case afdust sector inventories impacted by CoST packets

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
PROJECTION 2008 to 2020 ag emissions	PM_{10}	4,672,331	4,781,243	-108,912	-2.3%
PROJECTION 2008 to 2020 ag emissions	$PM_{2.5}$	911,888	933,259	-21,370	-2.3%

Table F-4. Summary of 2007 and 2020 base case ag sector inventories impacted by CoST packets

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
PROJECTION 2008 to 2020 ag emissions	NH3	3,603,653	3,772,764	-169,111	-4.7%

Table F-5. Summary of 2007 and 2020 base case c1c2marine sector inventories impacted by CoST packets

CoST Packet	Pollutant	2007 Emissions	2020 Emissions	Emissions Reductions	Percent Reductions
PROJECTION 2007v5: 2008 to 2020 c1c2rail	CO	200,516	218,413	-17,896	-8.9%
PROJECTION 2007v5: 2008 to 2020 c1c2rail	NO_X	1,260,516	877,300	383,216	30.4%
PROJECTION 2007v5: 2008 to 2020 c1c2rail	PM_{10}	41,443	24,137	17,306	41.8%
PROJECTION 2007v5: 2008 to 2020 c1c2rail	$PM_{2.5}$	38,839	22,623	16,216	41.8%
PROJECTION 2007v5: 2008 to 2020 c1c2rail	SO_2	44,790	2,536	42,254	94.3%
PROJECTION 2007v5: 2008 to 2020 c1c2rail	VOC	53,621	30,358	23,263	43.4%

Appendix G: SMOKE Input Data Files and Parameters Used in the 2007 Evaluation, 2007 Base and 2020 Base Cases

Table G-1 provides a list of inventory datasets and supporting datasets used by the movesmrg program for the onroad and onroad_rfl sector processing, and the smkinven program for all other sectors. Inputs for all three sectors are all three cases documented in the 2007v5 emissions modeling platform TSD: 2007ee_v5_07c, 2007re_v5_07c and 2020re_v5_07c. The datasets are referenced by name and version number. For example, 'afdust_paved_roads_2008v17_noPRECIPadj_FF10 [v0]' means version 0 of the dataset named afdust_paved_roads_2008v17_noPRECIPadj_FF10. The files released for the 2007v5 platform are named using the convention: dataset_name_<*changedate*>_v<*version#*>.txt where <*changedate*> represents the last modified date of the dataset with version integer number <*version#*>. The folders / subdirectories in which the files are located vary based on the type of data, although many of the inventory datasets can be found beneath a subdirectory named for the case (e.g., 2007re_v5_07c), and then within a subdirectory for the sector (e.g., nonpt). In Table G-1, the value in the column 'Match' is T when the identical dataset and version are used for all three cases and 'F' otherwise. Blank values under the "Sector(s)" column indicate a dataset that is used by all sectors *unless overridden by a sector-specific dataset.*

Table G-1. Input Inventories and Supporting Datasets Used in the 2007v5 Emissions Modeling Platform

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Meteorology temperature profiles	movesmrg	T	onroad	SMOKE_DAILY_2007ee [v0]	SMOKE_DAILY_2007ee [v0]	SMOKE_DAILY_2007ee [v0]
MOVES county cross-reference	movesmrg	T	onroad, onroad_rfl	MCXREF_2007ec [v0]	MCXREF_2007ec [v0]	MCXREF_2007ec [v0]
MOVES Emission Factor Table list, RPD RFL	movesmrg	F	onroad_rfl	mrclist_RPD_11apr2012_2007ec_RFLonly [v0]	mrclist_RPD_11apr2012_2007ec_RFLonly [v0]	mrclist_RPD_refueling_2020re_pm_naaqs [v0]
MOVES Emission Factor Table list, RPP	movesmrg	F	onroad	mrclist_RPP_11apr2012_2007ec [v0]	mrclist_RPP_11apr2012_2007ec [v0]	mrclist_RPP_2020re_pm_naaqs [v0]
MOVES Emission Factor Table list, RPD non-RFL	movesmrg	F	onroad	mrclist_RPD_11apr2012_2007ec_noRFL [v0]	mrclist_RPD_11apr2012_2007ec_noRFL [v0]	mrclist_RPD_2020re_pm_naaqs [v0]
MOVES Emission Factor Table list, RPV non-RFL	movesmrg	F	onroad	mrclist_RPV_11apr2012_2007ec_noRFL [v0]	mrclist_RPV_11apr2012_2007ec_noRFL [v0]	mrclist_RPV_2020re_pm_naaqs [v0]
MOVES Emission Factor Table list, RPV RFL	movesmrg	F	onroad_rfl	mrclist_RPV_11apr2012_2007ec_RFLonly [v0]	mrclist_RPV_11apr2012_2007ec_RFLonly [v0]	mrclist_RPV_refueling_2020re_pm_naaqs [v0]
MOVES Emission Factor Tables, RFL	movesmrg	F	onroad_rfl	EFtables_2010bBase2007_11apr2012_2007ec_RFLonly [v0]	EFtables_2010bBase2007_11apr2012_2007ec_RFLonly [v0]	EFtables_2010bPMNAAQS2020_AQ_06jul2012_2020re [v0]
MOVES Emission Factor Tables, non-RFL	movesmrg	F	onroad	EFtables_2010bBase2007_11apr2012_2007ec [v0]	EFtables_2010bBase2007_11apr2012_2007ec [v0]	
MOVES Emission Factor Tables	movesmrg	F	onroad	EFtables_2010bBase2007_11apr2012_2007ec_noRFL [v0]	EFtables_2010bBase2007_11apr2012_2007ec_noRFL [v0]	EFtables_2010bPMNAAQS2020_AQ_06jul2012_2020re [v0]
MOVES Hourly Speed Profiles	movesmrg	T	onroad, onroad_rfl	spdpro_2008nei [v0]	spdpro_2008nei [v0]	spdpro_2008nei [v0]
MOVES processes and pollutants, RPV	movesmrg	F	onroad	meproc_RPV_mplite [v1]	meproc_RPV_mplite [v1]	meproc_RPV_caponly [v0]
MOVES processes and pollutants, RPD RFL	movesmrg	T	onroad_rfl	meproc_RPD_mplite_or_caponly_refueling_only [v0]	meproc_RPD_mplite_or_caponly_refueling_only [v0]	meproc_RPD_mplite_or_caponly_refueling_only [v0]
MOVES processes and pollutants, RPD non-RFL	movesmrg	F	onroad	meproc_RPD_mplite [v2]	meproc_RPD_mplite [v2]	meproc_RPD_caponly [v0]
MOVES processes and pollutants, RPV RFL	movesmrg	T	onroad_rfl	meproc_RPV_mplite_or_caponly_refueling_only [v0]	meproc_RPV_mplite_or_caponly_refueling_only [v0]	meproc_RPV_mplite_or_caponly_refueling_only [v0]
MOVES processes and pollutants, RPP	movesmrg	F	onroad	meproc_RPP_mplite_or_caponly [v0]	meproc_RPP_mplite_or_caponly [v0]	meproc_RPP_mplite_or_caponly [v0]
MOVES reference county fuel month	movesmrg	T	onroad, onroad_rfl	MFMREF_2007ec [v0]	MFMREF_2007ec [v0]	MFMREF_2007ec [v0]
Area-to-point data	smkinven	T		artopnt_2002detroit [v0]	artopnt_2002detroit [v0]	artopnt_2002detroit [v0]
CEM annually summed data	smkinven	T	ptipm	cemsum_2007_revised [v0]	cemsum_2007_revised [v0]	cemsum_2007_revised [v0]
Country, State, County Information	smkinven	T		costcy_for_2007platform [v3]	costcy_for_2007platform [v3]	costcy_for_2007platform [v3]
Hour specific ag temporal profile, othar, nonpt and ag sectors	smkinven	T	othar	Gentpro_TPRO_HOUR_HOURLY_AGNH3.agNH3_2007eb_7may2012.ncf [v0]	Gentpro_TPRO_HOUR_HOURLY_AGNH3.agNH3_2007eb_7may2012.ncf [v0]	Gentpro_TPRO_HOUR_HOURLY_AGNH3.agNH3_2007eb_7may2012.ncf [v0]
Inventory afdust CAP	smkinven	F	afdust	2008NEI_v2_NONPOINT_afdust_nopavedroads_noRPO_FF10 [v0]	2008NEI_v2_NONPOINT_afdust_nopavedroads_noRPO_FF10 [v0]	2020re_from_2008NEI_v2_NONPOINT_afdust_nopavedroads_noRPO_FF10 [v0]
Inventory afdust CAP paved roads	smkinven	T	afdust	afdust_paved_roads_2008v17_noPRECIPadj_FF10 [v0]	afdust_paved_roads_2008v17_noPRECIPadj_FF10 [v0]	afdust_paved_roads_2008v17_noPRECIPadj_FF10 [v0]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Inventory afdust MARAMA	smkinven	F	afdust	marama_afdust_2007_Jan2012_for2007ed [v0]	marama_afdust_2007_Jan2012_for2007ed [v0]	2020re_from_marama_afdust_2007_Jan2012_for2007ed [v0]
Inventory afdust NY ag production	smkinven	F	afdust	2008NEI_v2_NONPOINT_afdust_NY_agproduction_ONLY_FF10 [v0]	2008NEI_v2_NONPOINT_afdust_NY_agproduction_ONLY_FF10 [v0]	2020re_from_2008NEI_v2_NONPOINT_afdust_NY_agproduction_ONLY_FF10 [v0]
Inventory afdust SESARM	smkinven	F	afdust	sesarm_afdust_semap_March2012_for2007ed [v0]	sesarm_afdust_semap_March2012_for2007ed [v0]	2020re_from_sesarm_afdust_semap_March2012_for2007ed [v0]
Inventory agburn monthly FF10	smkinven	T	nonpt	2008_agburn_fromdaily_FF10_22feb2012 [v0]	2008_agburn_fromdaily_FF10_22feb2012 [v0]	2008_agburn_fromdaily_FF10_22feb2012 [v0]
Inventory ag LADCO	smkinven	F	ag	mwrpo_agnh3_baseCv7_for2007ed_FF10 [v0]	mwrpo_agnh3_baseCv7_for2007ed_FF10 [v0]	2020re_from_mwrpo_agnh3_baseCv7_for2007ed_FF10 [v0]
Inventory ag NEI	smkinven	F	ag	2008NEI_v2_NONPOINT_ag_noLADCO_FF10 [v0]	2008NEI_v2_NONPOINT_ag_noLADCO_FF10 [v0]	2020re_from_2008NEI_v2_NONPOINT_ag_noLADCO_FF10 [v0]
Inventory avefire daily	smkinven	F	avefire		avefire_2003_2009_wild_2008only_prescribed [v0]	avefire_2003_2009_wild_2008only_prescribed [v0]
Inventory avefire daily - last day	smkinven	F	avefire		avefire_2003_2009_wild_2008only_prescribed_prevdec [v0]	avefire_2003_2009_wild_2008only_prescribed_prevdec [v0]
Inventory c1c2 California	smkinven	F	c1c2rail	2007ee_california_c1c2rail_annual_ff10_revised [v0]	2007ee_california_c1c2rail_annual_ff10_revised [v0]	2020re_california_c1c2rail_annual_ff10 [v0]
Inventory c1c2 CMV only, entire US	smkinven	F	c1c2rail	c1c2_cmv_NEI2008v2_RPO2007_SLT1_TX_CA_withPMadj [v1]	c1c2_cmv_NEI2008v2_RPO2007_SLT1_TX_CA_withPMadj [v1]	2020re_from_c1c2_cmv_NEI2008v2_RPO2007_SLT1_TX_CA_withPMadj [v0]
Inventory c1c2rail additional CAP/HAP from RFS2	smkinven	F	c1c2rail			C1C2_CMV_RAIL_2020_RFS2_additions_NONPOINT_ff10 [v0]
Inventory Cellulosic Plants	smkinven	F	nonpt			Cellulosic_plants_2020_NONPOINT_ff10 [v0]
Inventory daily fires 01 jan, CAP/HAP	smkinven	F	ptfire	ptfire_2007_jan [v0]		
Inventory daily fires 01 Jan, last day CAP/HAP	smkinven	F	ptfire	ptfire_2007_dec_lastdayonly [v1]		
Inventory daily fires 02 Feb, CAP/HAP	smkinven	F	ptfire	ptfire_2007_feb [v0]		
Inventory daily fires 02 Feb, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_jan_lastdayonly [v0]		
Inventory daily fires 03 Mar, CAP/HAP	smkinven	F	ptfire	ptfire_2007_mar [v0]		
Inventory daily fires 03 Mar, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_feb_lastdayonly [v0]		
Inventory daily fires 04 Apr, CAP/HAP	smkinven	F	ptfire	ptfire_2007_apr [v0]		
Inventory daily fires 04 Apr, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_mar_lastdayonly [v0]		
Inventory daily fires 05 May, CAP/HAP	smkinven	F	ptfire	ptfire_2007_may [v0]		
Inventory daily fires 05 May, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_apr_lastdayonly [v0]		
Inventory daily fires 06 Jun, CAP/HAP	smkinven	F	ptfire	ptfire_2007_jun [v0]		
Inventory daily fires 06 Jun, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_may_lastdayonly [v0]		
Inventory daily fires 07 Jul, CAP/HAP	smkinven	F	ptfire	ptfire_2007_jul [v0]		

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Inventory daily fires 07 Jul, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_jun_lastdayonly [v0]		
Inventory daily fires 08 Aug, CAP/HAP	smkinven	F	ptfire	ptfire_2007_aug [v0]		
Inventory daily fires 08 Aug, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_jul_lastdayonly [v0]		
Inventory daily fires 09 Sep, CAP/HAP	smkinven	F	ptfire	ptfire_2007_sep [v0]		
Inventory daily fires 09 Sep, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_aug_lastdayonly [v0]		
Inventory daily fires 10 Oct, CAP/HAP	smkinven	F	ptfire	ptfire_2007_oct [v0]		
Inventory daily fires 10 Oct, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_sep_lastdayonly [v0]		
Inventory daily fires 11 Nov, CAP/HAP	smkinven	F	ptfire	ptfire_2007_nov [v0]		
Inventory daily fires 11 Nov, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_oct_lastdayonly [v0]		
Inventory daily fires 12 Dec, CAP/HAP	smkinven	F	ptfire	ptfire_2007_dec [v0]		
Inventory daily fires 12 Dec, CAP/HAP last day	smkinven	F	ptfire	ptfire_2007_nov_lastdayonly [v0]		
Inventory Ethanol Transport	smkinven	F	nonpt			Ethanol_transport_vapor_2017ct_ref_caphap_25jul2011 [v0]
Inventory FF10 Offshore	smkinven	T	othpt	2008NEI_v2_POINT_20120202_for2007platform_offshore_FF10 [v0]	2008NEI_v2_POINT_20120202_for2007platform_offshore_FF10 [v0]	2008NEI_v2_POINT_20120202_for2007platform_offshore_FF10 [v0]
Inventory fire list	smkinven	F	ptfire	ptfire_2007 [v0]		
Inventory LADCO + MN 3 RWC SCCs	smkinven	F	nonpt	RWC_3SCCs_LADCO2008_fixed_ff10 [v0]	RWC_3SCCs_LADCO2008_fixed_ff10 [v0]	2020re_from_RWC_3SCCs_LADCO2008_fixed_ff10 [v0]
Inventory MARAMA open burning	smkinven	T	nonpt	MARAMA_open_burning_2007 [v0]	MARAMA_open_burning_2007 [v0]	MARAMA_open_burning_2007 [v0]
Inventory MARAMA RWC, NY and PA only	smkinven	F	nonpt	NYPA_RWC_2007_fixed_ff10 [v0]	NYPA_RWC_2007_fixed_ff10 [v0]	2020re_from_NYPA_RWC_2007_fixed_ff10 [v0]
Inventory monthly FF10 FL and GA open burning land clearing SESARM from PTDAY	smkinven	T	nonpt	openburning_landclearing_FLGA_sesarm2007_ff10 [v2]	openburning_landclearing_FLGA_sesarm2007_ff10 [v2]	openburning_landclearing_FLGA_sesarm2007_ff10 [v2]
Inventory nonpt	smkinven	F	nonpt	2008NEI_v2_NONPOINT_nonpt_remaining_run5_fixed_OHH_ff10 [v0]	2008NEI_v2_NONPOINT_nonpt_remaining_run5_fixed_OHH_ff10 [v0]	2020re_from_2008NEI_v2_NONPOINT_nonpt_remaining_run5_fixed_OHH_ff10 [v0]
Inventory onroad RPD, VMT	smkinven	F	onroad, onroad_rfl	VMT_2007 [v2]	VMT_2007 [v2]	VMT_pmnaaqs_2020 [v2]
Inventory onroad RPD, SPEED	smkinven	T	onroad, onroad_rfl	SPEED_2008NEI [v0]	SPEED_2008NEI [v0]	SPEED_2008NEI [v0]
Inventory onroad RPP, VPOP	smkinven	F	onroad, onroad_rfl	VPOP_2007 [v0]	VPOP_2007 [v0]	VPOP_pmnaaqs_2020 [v1]
Inventory othar nonpoint CAP Mexico	smkinven	F	othar	2008_Mexico_nonpoint_FF10 [v2]	2008_Mexico_nonpoint_FF10 [v2]	2018_Mexico_nonpoint_FF10 [v1]
Inventory othar nonroad CAP Mexico	smkinven	F	othar	2008_Mexico_nonroad_FF10 [v0]	2008_Mexico_nonroad_FF10 [v0]	2018_Mexico_nonroad_FF10 [v0]
Inventory othon CAP onroad Canada	smkinven	T	othon	canada_onroad_cap_2006_ff10 [v0]	canada_onroad_cap_2006_ff10 [v0]	canada_onroad_cap_2006_ff10 [v0]
Inventory othon CAP onroad California	smkinven	F	onroad			2020re_calif_nei_scc_onroad [v0]
Inventory othon CAP onroad Mexico	smkinven	F	othon	2008_Mexico_onroad_FF10 [v0]	2008_Mexico_onroad_FF10 [v0]	2018_Mexico_onroad_FF10 [v0]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Inventory othpt CAP point Mexico	smkinven	F	othpt	2008_Mexico_point_FF10_revised [v0]	2008_Mexico_point_FF10_revised [v0]	2018_Mexico_point_FF10 [v0]
Inventory PFC	smkinven	F	nonpt	2008NEI_v2_NONPOINT_PFC [v1]	2008NEI_v2_NONPOINT_PFC [v1]	pfc_2020_pmnaaqs [v0]
Inventory ptipm	smkinven	F	ptipm	2008NEI_v2_POINT_20120202_for2007ee_ptipm_FF10 [v0]	2008NEI_v2_POINT_20120202_for2007ee_ptipm_FF10 [v0]	PTINV_EPA410FINAL_BC_244_summer_2020_25JAN2012_ORL.txt [v0]
Inventory ptipm daily data (CEM sources)	smkinven	F	ptipm		ptday_ptipm_capcl_cem_2007ee [v0]	ptday_ptipm_cem_2020re [v0]
Inventory ptipm daily data (nonCEM sources)	smkinven	F	ptipm	ptday_ptipm_capcl_noncem_2007ee [v0]	ptday_ptipm_capcl_noncem_2007ee [v0]	ptday_ptipm_noncem_2020re [v0]
Inventory ptipm hourly CEM (SO2 and NOX)	smkinven	F	ptipm	ptipm_cem_hourly_2007_revised [v0]		
Inventory ptnonipm Biodiesel Plants from OTAQ	smkinven	F	ptnonipm			Biodiesel_plants_2020_POINT_ff10 [v0]
Inventory ptnonipm CAPHAP	smkinven	F	ptnonipm	2008NEI_v2_POINT_20120202_for2007ee_ptnonipm_stackfix_FF10_nz [v0]	2008NEI_v2_POINT_20120202_for2007ee_ptnonipm_stackfix_FF10 [v1]	2020re_from_2008NEIv2_ptnonipm_CAP_BAFM_via3CoST_strategies [v1]
Inventory ptnonipm CAPHAP South Dakota	smkinven	F	ptnonipm	ptinv_SD_ptnonipm_xportfrac_caphap2005v2_2005cs_plus_ethanol_plants_2005ct_FF10 [v0]	ptinv_SD_ptnonipm_xportfrac_caphap2005v2_2005cs_plus_ethanol_plants_2005ct_FF10 [v0]	2020re_from_ptinv_SD_ptnonipm_xportfrac_caphap2005v2_2005cs [v0]
Inventory ptnonipm cement ISIS NEW CAPs + HCl	smkinven	F	ptnonipm			cement_newkilns_ISIS2013_2007v5_POINT_ff10 [v0]
Inventory ptnonipm Ethanol Plants from OTAQ	smkinven	F	ptnonipm	Ethanol_plants_2007_RUN5_POINT_ff10 [v0]	Ethanol_plants_2007_RUN5_POINT_ff10 [v0]	Ethanol_plants_2020_POINT_ff10 [v0]
Inventory ptnonipm HAP Utah Rowley	smkinven	T	ptnonipm	2008NEI_v1_7_ptnonipm_Utah_Rowley_HAPs_FF10 [v0]	2008NEI_v1_7_ptnonipm_Utah_Rowley_HAPs_FF10 [v0]	2008NEI_v1_7_ptnonipm_Utah_Rowley_HAPs_FF10 [v0]
Inventory ptnonipm VA Meadwestvaco Packagaing CAPs only	smkinven	T	ptnonipm	2007_Nonhourly_Jan2012_VA_MEADWESTVACO_PACKAGING [v0]	2007_Nonhourly_Jan2012_VA_MEADWESTVACO_PACKAGING [v0]	2007_Nonhourly_Jan2012_VA_MEADWESTVACO_PACKAGING [v0]
Inventory ptnonipm WRAP PhaseIII Oil and Gas	smkinven	F	ptnonipm	2006_WRAP_PhaseIII_OIL_GAS_Point [v2]	2006_WRAP_PhaseIII_OIL_GAS_Point [v2]	2020re_from_2006_WRAP_PhaseIII_OIL_GAS_Point_v2_via_2CoST_strategies [v0]
Inventory rail non-RPO	smkinven	F	c1c2rail	2008NEI_v2_NONPOINT_rail_noRPO_FF10 [v1]	2008NEI_v2_NONPOINT_rail_noRPO_FF10 [v1]	2020re_from_2008NEI_v2_NONPOINT_rail_noRPO_FF10 [v0]
Inventory Rail only: 3 RPOs only	smkinven	F	c1c2rail	rail_ONLY_RPO2007 [v0]	rail_ONLY_RPO2007 [v0]	2020re_from_rail_ONLY_RPO2007 [v0]
Inventory rail Texas EPA estimated	smkinven	F	c1c2rail	2008_EPAonly_NONPOINT_20120211_TXrail [v0]	2008_EPAonly_NONPOINT_20120211_TXrail [v0]	2020re_from_2008_EPAonly_NONPOINT_20120211_TXrail [v0]
Inventory seca_c3 BAF HAPs Canada	smkinven	F	c3marine	eca_imo_CANADA_vochaps_2007 [v0]	eca_imo_CANADA_vochaps_2007 [v0]	eca_imo_CANADA_vochaps_2020_29MAR2012 [v0]
Inventory seca_c3 BAF HAPs US	smkinven	F	c3marine	eca_imo_US_vochaps_2007 [v0]	eca_imo_US_vochaps_2007 [v0]	eca_imo_US_vochaps_2020_29MAR2012 [v0]
Inventory seca_c3 CAP Canada	smkinven	F	c3marine	eca_imo_CANADA_caps_2007 [v0]	eca_imo_CANADA_caps_2007 [v0]	eca_imo_CANADA_caps_2020_29MAR2012 [v0]
Inventory seca_c3 CAP US	smkinven	F	c3marine	eca_imo_caps_US_2007 [v0]	eca_imo_caps_US_2007 [v0]	eca_imo_caps_US_2020_29MAR2012 [v0]
Inventory SESARM RWC	smkinven	F	nonpt	SESARM_RWC_2007_fixed_ff10 [v0]	SESARM_RWC_2007_fixed_ff10 [v0]	2020re_from_SESARM_RWC_2007_fixed_ff10 [v0]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Inventory Table - HAPCAP EBAFM integration CMAQ-lite v4.7 N1e HDGHG	smkinven	T	onroad, onroad_rfl	invtable_hapcap_cb05soa [v13]	invtable_hapcap_cb05soa [v13]	invtable_hapcap_cb05soa [v13]
Inventory Table - HAPCAP integration but no toxics	smkinven	T		invtable_hapcapintegate_cb05soa_nomp_nohg [v8]	invtable_hapcapintegate_cb05soa_nomp_nohg [v8]	invtable_hapcapintegate_cb05soa_nomp_nohg [v9]
Inventory Table - noHAPuse sectors, no toxics	smkinven	F	ptfire, ptipm, ptnonipm, avefire	invtable_hapcapnohapuse_cb05soa_nomp_nohg [v2]	invtable_hapcapnohapuse_cb05soa_nomp_nohg [v2]	invtable_hapcapnohapuse_cb05soa_nomp_nohg [v4]
Inventory Year 2006 Phase III oil & gas	smkinven	F	nonpt	2006_WRAP_PhaseIII_OIL_GAS_Area [v1]	2006_WRAP_PhaseIII_OIL_GAS_Area [v1]	2020re_from_2006_WRAP_PhaseIII_OIL_GAS_Area [v0]
Mobile codes file default	smkinven	T		mcodes [v4]	mcodes [v4]	mcodes [v4]
NHAPEXCLUDE everything	smkinven	F	avefire		nhapexclude_everything [v0]	nhapexclude_everything [v0]
NHAPEXCLUDE c1c2rail	smkinven	T	c1c2rail	nhapexclude_2007ed_c1c2rail_withRPOs_linebased [v1]	nhapexclude_2007ed_c1c2rail_withRPOs_linebased [v1]	nhapexclude_2007ed_c1c2rail_withRPOs_linebased [v1]
NHAPEXCLUDE nonpt	smkinven	F	nonpt	nhapexclude_2008V2_nonpt [v4]	nhapexclude_2008V2_nonpt [v4]	nhapexclude_2008V2_nonpt [v6]
NHAPEXCLUDE NONROAD	smkinven	T	nonroad	nhapexclude_nonroad_2007ee [v0]	nhapexclude_nonroad_2007ee [v0]	nhapexclude_nonroad_2007ee [v0]
NHAPEXCLUDE ptnonipm	smkinven	T	ptnonipm	nhapexclude_ptnonipm_include_30125010 [v0]	nhapexclude_ptnonipm_include_30125010 [v0]	nhapexclude_ptnonipm_include_30125010 [v0]
NHAPEXCLUDE nothing	smkinven	F	c3marine	nhapexclude_nothing [v0]	nhapexclude_nothing [v0]	
Nonroad Monthly FF10 California	smkinven	F	nonroad	2007ee_california_nonroad_monthly_ff10_revised [v0]	2007ee_california_nonroad_monthly_ff10_revised [v0]	2020re_california_nonroad_monthy_ff10 [v0]
Nonroad Monthly FF10 non-California	smkinven	F	nonroad	2007_monthly_nonroad_ff10_noCalif [v0]	2007_monthly_nonroad_ff10_noCalif [v0]	2020_nonroad_PM_NAAQS_FF10 [v1]
ORIS Description	smkinven	T		orisdesc [v0]	orisdesc [v0]	orisdesc [v0]
ORL Nonpoint Inventory - Afdust Canada 2006	smkinven	T	othar	canada_afdust_xportfrac_cap_2006 [v0]	canada_afdust_xportfrac_cap_2006 [v0]	canada_afdust_xportfrac_cap_2006 [v0]
ORL Nonpoint Inventory - Ag Canada 2006	smkinven	T	othar	canada_ag_cap_2006 [v0]	canada_ag_cap_2006 [v0]	canada_ag_cap_2006 [v0]
ORL Nonpoint Inventory - Aircraft Canada 2006	smkinven	T	othar	canada_aircraft_cap_2006 [v0]	canada_aircraft_cap_2006 [v0]	canada_aircraft_cap_2006 [v0]
ORL Nonpoint Inventory - Commercial Marine Canada 2006	smkinven	T	othar	canada_marine_cap_2006 [v0]	canada_marine_cap_2006 [v0]	canada_marine_cap_2006 [v0]
ORL Nonpoint Inventory - Nonroad Canada 2006	smkinven	T	othar	canada_offroad_cap_2006 [v0]	canada_offroad_cap_2006 [v0]	canada_offroad_cap_2006 [v0]
ORL Nonpoint Inventory - Oarea Canada 2006	smkinven	T	othar	canada_oarea_cap_2006 [v3]	canada_oarea_cap_2006 [v3]	canada_oarea_cap_2006 [v3]
ORL Nonpoint Inventory - Rail Canada 2006	smkinven	T	othar	canada_rail_cap_2006 [v0]	canada_rail_cap_2006 [v0]	canada_rail_cap_2006 [v0]
ORL Point Inventory - Point 2006	smkinven	T	othpt	canada_point_2006_orl [v2]	canada_point_2006_orl [v2]	canada_point_2006_orl [v2]
ORL Point Inventory - Point CB5 2006	smkinven	T	othpt	canada_point_cb5_2006_orl [v0]	canada_point_cb5_2006_orl [v0]	canada_point_cb5_2006_orl [v0]
ORL Point Inventory - Upstream Oil & Gas 2006	smkinven	T	othpt	canada_point_uog_2006_orl [v0]	canada_point_uog_2006_orl [v0]	canada_point_uog_2006_orl [v0]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
SCC descriptions	smkinven	T		sccdesc_pf31 [v15]	sccdesc_pf31 [v15]	sccdesc_pf31 [v15]
Stack replacement	smkinven	T		pstk [v0]	pstk [v0]	pstk [v0]

Table G-2 documents the ancillary input datasets and versions used for the 2007 evaluation, 2007 base and 2020 base cases. The datasets are referenced by name and version number. For example, 'amgref_us_can_mex_revised [v21]' corresponds to version 21 of the dataset named amgref_us_can_mex_revised. The files released for the 2007v5 platform are named using the convention: dataset_name_<*changedate*>_v<*version#*>.txt where <c*hangedate*> represents the last modified date of the dataset with version integer number <*version#*>. The folders / subdirectories in which the files are located vary based on the type of data, although many of the ancillary datasets can be found beneath the ge_dat subdirectory.

The inputs that are not identical in all three cases have an 'F' (for False) in the Match columns, while those that do not change have a 'T' (for True) in the Match column. The contents of Table G-2 reveal that the ancillary input data in the future-year scenarios are very similar to those used in the 2007 evaluation and 2007 base cases except for the speciation profiles and cross references used for gasoline-related sources, which change in the future to account for increased ethanol usage in gasoline. The list of sectors for the mrggrid program also changes because this dataset controls the reuse of data between runs (for example the biogenic emissions for 2007 are reused in all cases, including the 2020 base case). It is standard practice to develop a separate list of sectors for each case, as is shown here. We also do not list version changes that were needed to accommodate the 2020 base case that had no impact on the backwards compatibility of the 2007 evaluation and/or 2007 base cases. For example, the dataset 'repconfig_area_invgrid_caphap_scc7 [v1]' was corrected in version 1 for use in the 2020 base case. We will not provide the version 0 of this report configuration file that results in an erroneous SMOKE report for the afdust sector.

Table G-2. Remaining Input Ancillary Datasets Used in the 2007v5 Emissions Modeling Platform

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
emf job header	All programs	T		emf_jobheader_garnet [v0]	emf_jobheader_garnet [v0]	emf_jobheader_garnet [v0]
Afdust xportfrac	All programs for sector	T	afdust	Afdust xportfrac 12US1 [v0]	Afdust xportfrac 12US1 [v0]	Afdust xportfrac 12US1 [v0]
Grid Description List	Grdmat	T		griddesc_lambertonly [v45]	griddesc_lambertonly [v45]	griddesc_lambertonly [v45]
Gridding surrogates CAN-MEX 12km	Grdmat	T	othon, othar	CAN-MEX_12US1 [v0]	CAN-MEX_12US1 [v0]	CAN-MEX_12US1 [v0]
Gridding surrogates USA 12km	Grdmat	T		CONUS12_2010 v2 surrogates [v0]	CONUS12_2010 v2 surrogates [v0]	CONUS12_2010 v2 surrogates [v0]
nonpoint & nonroad surrogate xref	Grdmat	T	othar	amgref_can2006_mex_12US1 [v1]	amgref_can2006_mex_12US1 [v1]	amgref_can2006_mex_12US1 [v1]
nonpoint & nonroad surrogate xref	Grdmat	T		amgref_us_can_mex_revised [v21]	amgref_us_can_mex_revised [v21]	amgref_us_can_mex_revised [v21]
onroad surrogate xref default	Grdmat	T		amgref_us_can_mex_revised [v20]	amgref_us_can_mex_revised [v20]	amgref_us_can_mex_revised [v20]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
onroad surrogate xref refueling	Grdmat	T	onroad_rfl	mgref_smoke_moves_onroad_rfl [v0]	mgref_smoke_moves_onroad_rfl [v0]	mgref_smoke_moves_onroad_rfl [v0]
othon griddingg xref	Grdmat	T	othon	amgref_can2006_mex_12US1 [v1]	amgref_can2006_mex_12US1 [v1]	amgref_can2006_mex_12US1 [v1]
surrogate descriptions (works for all grids), CAN/MEX	Grdmat	T	othar, othon	srgdesc_can2006_mex_12US1 [v1]	srgdesc_can2006_mex_12US1 [v1]	srgdesc_can2006_mex_12US1 [v1]
surrogate descriptions (works for all grids), US	Grdmat	T		srgdesc_CONUS12_2010 [v3]	srgdesc_CONUS12_2010 [v3]	srgdesc_CONUS12_2010 [v3]
Elevation Configuration File for c3marine sector	Laypoint	T	c3marine	pelvconfig_seca_c3 [v1]	pelvconfig_seca_c3 [v1]	pelvconfig_seca_c3 [v1]
Elevation Configuration File for Point Sources	Laypoint	T		pelvconfig_inline_allpts [v1]	pelvconfig_inline_allpts [v1]	pelvconfig_inline_allpts [v1]
Elevation Configuration File for Ptfire	Laypoint	F	ptfire	pelvconfig_ptfire_inline_pf31 [v1]		
List of sectors for mrggrid	Mrggrid	F		sectorlist_2007ee_v5_07c [v0]	sectorlist_2007re_v5_07c [v1]	sectorlist_2020re_v5_07c [v0]
Biogenic land use, file A, 12US1	Normbeis3	T	beis	LANDA_12US1 [v0]	LANDA_12US1 [v0]	LANDA_12US1 [v0]
Biogenic land use, file B, 12US1	Normbeis3	T	beis	LANDB_12US1 [v0]	LANDB_12US1 [v0]	LANDB_12US1 [v0]
Biogenic land use, totals, 12US1	Normbeis3	T	beis	LAND_TOTALS_12US1 [v0]	LAND_TOTALS_12US1 [v0]	LAND_TOTALS_12US1 [v0]
Smkmerge representative dates files	Run script	T		merge_dates_2007 (/garnet/oaqps) [v0]	merge_dates_2007 (/garnet/oaqps) [v0]	merge_dates_2007 (/garnet/oaqps) [v0]
Biogenic gridding surrogate for reports 12EUS1	Smkmerge	T	beis	bgpro_12US1_USonly (/garnet/oaqps) [v0]	bgpro_12US1_USonly (/garnet/oaqps) [v0]	bgpro_12US1_USonly (/garnet/oaqps) [v0]
MACT Description	Smkreport	T		mactdesc_2002v3 [v1]	mactdesc_2002v3 [v1]	mactdesc_2002v3 [v1]
NAICS descriptions	Smkreport	T		naicsdesc [v0]	naicsdesc [v0]	naicsdesc [v0]
Report configuration, ag inventory	Smkreport	T	ag	repconfig_ag_inv [v4]	repconfig_ag_inv [v4]	repconfig_ag_inv [v4]
Report configuration, area temporal	Smkreport	T	ag	repconfig_area_temporal_2007platform [v0]	repconfig_area_temporal_2007platform [v0]	repconfig_area_temporal_2007platform [v0]
Report configuration, not-default nonpoint inventory	Smkreport	T	nonpt, c1c2rail, afdust	repconfig_alm_inv_caphap [v0]	repconfig_alm_inv_caphap [v0]	repconfig_alm_inv_caphap [v0]
Report configuration, c3marine gridded	Smkreport	T	c3marine	repconfig_pt_noplant_invgrid_caphap [v1]	repconfig_pt_noplant_invgrid_caphap [v1]	repconfig_pt_noplant_invgrid_caphap [v1]
Report configuration, c3marine inventory	Smkreport	T	c3marine	repconfig_seca_c3_inv_caphap [v0]	repconfig_seca_c3_inv_caphap [v0]	repconfig_seca_c3_inv_caphap [v0]
Report configuration, for onroad SMOKE-MOVES	Smkreport	T	onroad, onroad_rfl	repconfig_onroad_MOVES_inv_caphap [v0]	repconfig_onroad_MOVES_inv_caphap [v0]	repconfig_onroad_MOVES_inv_caphap [v0]
Report configuration, for onroad SMOKE-MOVES, gridded	Smkreport	T	onroad, onroad_rfl	repconfig_onroad_MOVES_invgrid_caphap [v0]	repconfig_onroad_MOVES_invgrid_caphap [v0]	repconfig_onroad_MOVES_invgrid_caphap [v0]
Report configuration, gridded SCC7	Smkreport	T	afdust	repconfig_area_invgrid_caphap_scc7 [v1]	repconfig_area_invgrid_caphap_scc7 [v1]	repconfig_area_invgrid_caphap_scc7 [v1]
Report configuration, default gridded	Smkreport	T		repconfig_area_invgrid_caphap [v1]	repconfig_area_invgrid_caphap [v1]	repconfig_area_invgrid_caphap [v1]
Report configuration, nonpoint default inventory	Smkreport	T		repconfig_area_inv_caphap [v0]	repconfig_area_inv_caphap [v0]	repconfig_area_inv_caphap [v0]
Report configuration, nonpoint default VOCprof	Smkreport	T		repconfig_area_inv2 [v0]	repconfig_area_inv2 [v0]	repconfig_area_inv2 [v0]
Report configuration, nonroad gridded	Smkreport	T	nonroad	repconfig_nonroad_invgrid_caphap_12US1 [v1]	repconfig_nonroad_invgrid_caphap_12US1 [v1]	repconfig_nonroad_invgrid_caphap_12US1 [v1]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Report configuration, nonroad inventory	Smkreport	T	nonroad	repconfig_nonroad_inv_caphap [v0]	repconfig_nonroad_inv_caphap [v0]	repconfig_nonroad_inv_caphap [v0]
Report configuration, nonroad VOCprof (EVP__VOC)	Smkreport	T	nonroad	repconfig_nonroad_inv2b [v1]	repconfig_nonroad_inv2b [v1]	repconfig_nonroad_inv2b [v1]
Report configuration, nonroad VOCprof (EXH__VOC)	Smkreport	T	nonroad	repconfig_nonroad_inv2a [v1]	repconfig_nonroad_inv2a [v1]	repconfig_nonroad_inv2a [v1]
Report configuration, nonroad VOCprof (RFL__VOC)	Smkreport	T	nonroad	repconfig_nonroad_inv2c [v1]	repconfig_nonroad_inv2c [v1]	repconfig_nonroad_inv2c [v1]
Report configuration, othar/othon inventory	Smkreport	T	othar, othon	repconfig_othar_inv [v0]	repconfig_othar_inv [v0]	repconfig_othar_inv [v0]
Report configuration, othpt inventory	Smkreport	T	othpt	repconfig_othpt_inv [v0]	repconfig_othpt_inv [v0]	repconfig_othpt_inv [v0]
Report configuration, point VOCprof	Smkreport	T	c3marine, othpt, ptipm, ptnonipm	repconfig_point_inv2 [v0]	repconfig_point_inv2 [v0]	repconfig_point_inv2 [v0]
Report configuration, ptipm/ptnonipm inventory	Smkreport	T	ptipm, ptnonipm	repconfig_point_inv_caphap [v0]	repconfig_point_inv_caphap [v0]	repconfig_point_inv_caphap [v0]
SIC descriptions	Smkreport	T		sic_desc [v0]	sic_desc [v0]	sic_desc [v0]
Combination profiles	Spcmat	F		gspro_combo_2005 [v2]		
Combination profiles - Can/Mex	Spcmat	F	othon			gspro_combo_2005 [v2]
Combination profiles - nonpt	Spcmat	F	nonpt	gspro_combo_2007platform_2007eb_nonpt [v7]	gspro_combo_2007platform_2007eb_nonpt [v7]	
Combination profiles - nonroad	Spcmat	F	nonroad	gspro_combo_2007platform_2007ec_nonroad [v0]	gspro_combo_2007platform_2007ec_nonroad [v0]	
Combination profiles - onroad	Spcmat	F	onroad, onroad_rfl	gspro_combo_2007platform_2007ee_onroad [v0]	gspro_combo_2007platform_2007ee_onroad [v0]	gspro_combo_pmnaaqsfinal_2020re_onroad [v0]
Combination profiles - ptnonipm (same as nonpt)	Spcmat	F	ptnonipm	gspro_combo_2007platform_2007eb_nonpt [v7]	gspro_combo_2007platform_2007eb_nonpt [v7]	
GSCNV - pollutant to pollutant conversions	Spcmat	F		gscnv_cmaq_cb05_tx_pf4 [v3]	gscnv_cmaq_cb05_tx_pf4 [v3]	gscnv_cmaq_cb05_tx_pf4 [v4]
GSCNV - pollutant to pollutant conversions 8762/8763 toxics	Spcmat	T		gscnv_cmaq_cb05_hspace_toxic [v0]	gscnv_cmaq_cb05_hspace_toxic [v0]	gscnv_cmaq_cb05_hspace_toxic [v0]
GSCNV - pollutant to pollutant conversions for 8762/8763 BAF	Spcmat	T		gscnv_cmaq_cb05_hspace_BAF [v0]	gscnv_cmaq_cb05_hspace_BAF [v0]	gscnv_cmaq_cb05_hspace_BAF [v0]
GSPRO speciated 8762/8763 BAF	Spcmat	F		gspro_cmaq_cb05_hspace_BAF [v1]	gspro_cmaq_cb05_hspace_BAF [v1]	
GSPRO speciated 8762/8763 NONHAPTOG	Spcmat	F		gspro_cmaq_cb05_hspace_toxic [v0]	gspro_cmaq_cb05_hspace_toxic [v0]	
GSPRO speciated 8762/8763 TOG	Spcmat	F		gspro_cmaq_cb05_hspace_nontoxic [v0]	gspro_cmaq_cb05_hspace_nontoxic [v0]	
GSPRO speciated MOVES PM	Spcmat	T		gspro_speciated_pm [v3]	gspro_speciated_pm [v3]	gspro_speciated_pm [v3]
GSREF NH3_FERT	Spcmat	T	ag	gsref_nh3_fert [v2]	gsref_nh3_fert [v2]	gsref_nh3_fert [v2]
GSREF speciated EXH__PMFINE	Spcmat	T	onroad, onroad_rfl	gsref_pmfine_speciatedpmfine [v5]	gsref_pmfine_speciatedpmfine [v5]	gsref_pmfine_speciatedpmfine [v5]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
GSREF speciated PM	Spcmat	T		gsref_speciated_pm [v2]	gsref_speciated_pm [v2]	gsref_speciated_pm [v2]
Speciation profiles additional for SMOKE-MOVES	Spcmat	F	onroad, onroad_rfl	gspro_new_for_smoke_moves_PMOTHER [v0]	gspro_new_for_smoke_moves_PMOTHER [v0]	gspro_new_for_smoke_moves_PMOTHER [v1]
Speciation profiles Canada PM	Spcmat	T	othpt	gspro_pm25_canada_2006_point [v0]	gspro_pm25_canada_2006_point [v0]	gspro_pm25_canada_2006_point [v0]
Speciation profiles for biogenics	Spcmat	T	beis	gspro_biogenics [v0]	gspro_biogenics [v0]	gspro_biogenics [v0]
Speciation profiles for HG	Spcmat	T		gspro_hg [v2]	gspro_hg [v2]	gspro_hg [v2]
Speciation profiles for INTEGRATE HAPS	Spcmat	T		gspro_integratehaps_cb05_tx_pf4 [v3]	gspro_integratehaps_cb05_tx_pf4 [v3]	gspro_integratehaps_cb05_tx_pf4 [v3]
Speciation profiles for NONHAPTOG	Spcmat	F		gspro_nonhaptog_cb05_tx_pf4_pretier2 [v4]	gspro_nonhaptog_cb05_tx_pf4_pretier2 [v4]	gspro_nonhaptog_cb05_eprofiles_2020re_pmnaaqsfinal_notonroad [v0]
Speciation profiles for NONHAPTOG w/ETOH integration	Spcmat	F	onroad, onroad_rfl	gspro_nonhaptog_cb05_eprofiles [v0]	gspro_nonhaptog_cb05_eprofiles [v0]	gspro_nonhaptog_cb05_eprofiles_2020re_pmnaaqsfinal_onroad [v0]
Speciation profiles for NOX	Spcmat	T		gspro_nox_hono_pf4 [v0]	gspro_nox_hono_pf4 [v0]	gspro_nox_hono_pf4 [v0]
Speciation profiles for PM2.5	Spcmat	T		gspro_pm25_speciatedPMFINE [v1]	gspro_pm25_speciatedPMFINE [v1]	gspro_pm25_speciatedPMFINE [v1]
Speciation profiles for PM2.5	Spcmat	T	onroad, onroad_rfl	gspro_pm25 [v2]	gspro_pm25 [v2]	gspro_pm25 [v2]
Speciation profiles for SO2-SULF	Spcmat	T		gspro_sulf [v1]	gspro_sulf [v1]	gspro_sulf [v1]
Speciation profiles for TOG	Spcmat	F	onroad, onroad_rfl	gspro_tog_cb05_soa [v3]	gspro_tog_cb05_soa [v3]	
Speciation profiles for TOG	Spcmat	F		gspro_tog_cb05_soa_pf4_pretier2 [v4]	gspro_tog_cb05_soa_pf4_pretier2 [v4]	gspro_tog_cb05_soa_2020re_pmnaaqsfinal [v1]
Speciation profiles Other VOC HAP	Spcmat	F	onroad, onroad_rfl	gspro_other_hapvoc_no_benz-benz [v0]	gspro_other_hapvoc_no_benz-benz [v0]	
Speciation profiles PMFINE to AE6	Spcmat	T	onroad, onroad_rfl	gspro_pmfine_speciatedPMFINE [v0]	gspro_pmfine_speciatedPMFINE [v0]	gspro_pmfine_speciatedPMFINE [v0]
Speciation profiles speciated VOC	Spcmat	F		gspro_speciated_voc [v0]	gspro_speciated_voc [v0]	gspro_speciated_voc [v2]
Speciation profiles static	Spcmat	T		gspro_static_cmaq [v13]	gspro_static_cmaq [v13]	gspro_static_cmaq [v13]
Speciation profiles TOG - WRAP Phase III Oil and Gas	Spcmat	T		gspro_TOG_WRAP_PhaseIII [v3]	gspro_TOG_WRAP_PhaseIII [v3]	gspro_TOG_WRAP_PhaseIII [v3]
Speciation xref CAP static	Spcmat	T		gsref_static_cap_pf4 [v1]	gsref_static_cap_pf4 [v1]	gsref_static_cap_pf4 [v1]
Speciation xref for Canada PM	Spcmat	T	othpt	gsref_pm25_canada_2006_point [v3]	gsref_pm25_canada_2006_point [v3]	gsref_pm25_canada_2006_point [v3]
Speciation xref for Integrate-HAPs static	Spcmat	T		gsref_static_integratehap_emv4 [v2]	gsref_static_integratehap_emv4 [v2]	gsref_static_integratehap_emv4 [v2]
Speciation xref for NONHAPVOC, not year-specific	Spcmat	F		gsref_nonhapvoc_general_ldghg_cr_update [v11]	gsref_nonhapvoc_general_ldghg_cr_update [v11]	gsref_nonhapvoc_general_pmnaaqsfinal [v1]
Speciation xref for NONHAPVOC, not year-specific - nonpt	Spcmat	F	nonpt			gsref_nonhapvoc_general_pmnaaqsfinal [v2]
Speciation xref for NONHAPVOC, year-specific	Spcmat	F		gsref_nonhapvoc_2005_ldghg_cr_update [v11]	gsref_nonhapvoc_2005_ldghg_cr_update [v11]	gsref_nonhapvoc_2020_pmnaaqsfinal [v1]
Speciation xref for PM2.5 diesel SCCs but do not produce diesel	Spcmat	T		gsref_no_dieselpm [v5]	gsref_no_dieselpm [v5]	gsref_no_dieselpm [v5]

Input Name	Program	Match	Sector(s)	Dataset and version for 2007ee_v5_07c	Dataset and version for 2007re_v5_07c	Dataset and version for 2020re_v5_07c
Speciation xref for PM2.5 non-diesel SCCs	Spcmat	T		gsref_pm25_pf4_nondiesel [v23]	gsref_pm25_pf4_nondiesel [v23]	gsref_pm25_pf4_nondiesel [v23]
Speciation xref for SMOKE-MOVES not TOG	Spcmat	T	onroad, onroad_rfl	gsref_new_for_smoke-moves_otherthantog [v0]	gsref_new_for_smoke-moves_otherthantog [v0]	gsref_new_for_smoke-moves_otherthantog [v0]
Speciation xref for SMOKE-MOVES TOG	Spcmat	F	onroad, onroad_rfl	gsref_new_for_smoke-moves_tog [v3]	gsref_new_for_smoke-moves_tog [v3]	gsref_smoke_moves_tog_2020re_pmnaaqsfinal [v2]
Speciation xref for SO2-SULF	Spcmat	T		gsref_sulf [v0]	gsref_sulf [v0]	gsref_sulf [v0]
Speciation xref for speciated VOC	Spcmat	T	othpt, onroad, onroad_rfl	gsref_speciated_voc [v2]	gsref_speciated_voc [v2]	gsref_speciated_voc [v2]
Speciation xref for VOC, not year-specific	Spcmat	F		gsref_voc_general_ldghg [v16]	gsref_voc_general_ldghg [v16]	gsref_voc_general_pmnaaqsfinal [v2]
Speciation xref for VOC, year-specific	Spcmat	F		gsref_voc_2005_ldghg [v9]	gsref_voc_2005_ldghg [v9]	gsref_voc_2020_pmnaaqsfinal [v1]
Speciation xref for WRAP PHse III Oil and Gas	Spcmat	T		gsref_WRAP_PhaseIII_oil_gas [v3]	gsref_WRAP_PhaseIII_oil_gas [v3]	gsref_WRAP_PhaseIII_oil_gas [v3]
Speciation xref HG	Spcmat	T		gsref_hg [v8]	gsref_hg [v8]	gsref_hg [v8]
Speciation xref static NOX -- HONO for mobile sources	Spcmat	T		gsref_static_nox_hono_pf4 [v9]	gsref_static_nox_hono_pf4 [v9]	gsref_static_nox_hono_pf4 [v9]
Day specific RWC temporal	Temporal	T	nonpt	Gentpro_TPRO_DAY_DAILY_RWC.2007ed_v5_official [v0]	Gentpro_TPRO_DAY_DAILY_RWC.2007ed_v5_official [v0]	Gentpro_TPRO_DAY_DAILY_RWC.2007ed_v5_official [v0]
Holidays table	Temporal	T		holidays [v0]	holidays [v0]	holidays [v0]
Temporal profiles, all nonpoint and nonroad	Temporal	T		amptpro_2008aa_us_can_revised [v2]	amptpro_2008aa_us_can_revised [v2]	amptpro_2008aa_us_can_revised [v2]
Temporal profiles, all point	Temporal	T		amptpro_2007ec_us_can_revised [v0]	amptpro_2007ec_us_can_revised [v0]	amptpro_2007ec_us_can_revised [v0]
Temporal profiles, onroad default	Temporal	T		amptpro_2008aa_us_can_revised [v2]	amptpro_2008aa_us_can_revised [v2]	amptpro_2008aa_us_can_revised [v2]
Temporal xref, ag	Temporal	T	ag	Gentpro_TREF_agNH3_RWC_2007ed_ag [v0]	Gentpro_TREF_agNH3_RWC_2007ed_ag [v0]	Gentpro_TREF_agNH3_RWC_2007ed_ag [v0]
Temporal xref, all nonpoint and nonroad	Temporal	T		Gentpro_TREF_agNH3_RWC_2007ed [v0]	Gentpro_TREF_agNH3_RWC_2007ed [v0]	Gentpro_TREF_agNH3_RWC_2007ed [v0]
Temporal xref, nonpt	Temporal	T	nonpt	Gentpro_TREF_DAILY_RWC.RWC_2007ed [v0]	Gentpro_TREF_DAILY_RWC.RWC_2007ed [v0]	Gentpro_TREF_DAILY_RWC.RWC_2007ed [v0]
Temporal xref, onroad mobile default	Temporal	T	onroad, onroad_rfl	Gentpro_TREF_agNH3_RWC_2007ea_v5_flatonroadmonthly [v0]	Gentpro_TREF_agNH3_RWC_2007ea_v5_flatonroadmonthly [v0]	Gentpro_TREF_agNH3_RWC_2007ea_v5_flat onroadmonthly [v0]
Temporal xref, onroad mobile default	Temporal	T		Gentpro_TREF_agNH3_RWC_2007ed [v0]	Gentpro_TREF_agNH3_RWC_2007ed [v0]	Gentpro_TREF_agNH3_RWC_2007ed [v0]
Temporal xref, othpt	Temporal	T	othpt	ptref_othpt [v5]	ptref_othpt [v5]	ptref_othpt [v5]
Temporal xref, point default	Temporal	T		Gentpro_TREF_agNH3_RWC_2007ed [v0]	Gentpro_TREF_agNH3_RWC_2007ed [v0]	Gentpro_TREF_agNH3_RWC_2007ed [v0]
Temporal xref, ptipm only	Temporal	T	ptipm	ptref_ptipm_us [v0]	ptref_ptipm_us [v0]	ptref_ptipm_us [v0]
BEIS3 emission factors	Tmpbeis3	T	beis	beis3_efac_v3.14 [v0]	beis3_efac_v3.14 [v0]	beis3_efac_v3.14 [v0]
Bioseasons file 12US1	Tmpbeis3	T	beis	bioseason_2007c_12US1 [v0]	bioseason_2007c_12US1 [v0]	bioseason_2007c_12US1 [v0]

Table G-3 provides configuration settings for various SMOKE programs. Note that the values for most of these settings are the same for all three cases, so the values are only listed once for each sector(s). There are a couple of exceptions to this: 1) the 2007 evaluation case uses hour specific emissions (HOUR_SPECIFIC_YN = Y) while the 2007 and 2020 base cases do not (N). These parameters are specific to using SMOKE version 3.1. Some of these parameters will not work on older versions of SMOKE; for example FF10_AVEDAY_ANNINV_YN set to "Y" allows smkinven to properly read FF10 daily nonpoint data in the avefire processing. A parameter not assigned to "All sectors" will supersede (override) the value of "All sectors" for that parameter. The value "All sectors" is often the default setting when only a couple of sectors require a different value.

Table G-3. Parameter Settings for All 2007v5 Emissions Modeling Cases

Parameter Name	Environment Variable	Sector(s)	Program	Value
All months across all sectors	ALL_MONTHS	All sectors	Run script	1 2 3 4 5 6 7 8 9 10 11 12
Archive sectors from older cases	ARCHIVE_ALL_SECTORS	asm_backup	Run script	N
Biogenics land area surrogate	AREA_SURROGATE_NUM	beis	Smkmerge	340
BEIS3 version	BEIS3_VERSION	beis	Run script	3.14
Output county biogenic totals	BIO_COUNTY_SUMS	beis	Run script	Y
Output state biogenic totals	BIO_STATE_SUMS	beis	Run script	Y
Biogenics speciation profile code	BIOG_SPRO	beis	Tmpbeis3	B10C5
Check stack parameters for missing	CHECK_STACKS_YN	ptfire	smkinven	N
Use day-specific emission	DAY_SPECIFIC_YN	avefire, ptfire, ptipm	smkinven	Y
Use day-specific emission: onetime job	DAY_SPECIFIC_YN	avefire, ptfire, ptipm	smkinven	N
EGU daily type	EGU_TYPE	All sectors	Run script	model_performance
Ptfire Inline	ELEVPOINT_DAILY	ptfire	All programs	Y
Use FF10 Daily Nonpoint format	FF10_AVEDAY_ANNINV_YN	avefire	smkinven	Y
Fill annual values	FILL_ANNUAL	ag, nonpt, nonroad, onroad, onroad_rfl	smkinven	Y
Fill annual values	FILL_ANNUAL	All sectors	smkinven	N
Fire-specific plume rise calculations	FIRE_PLUME_YN	ptfire	Laypoint	Y
Match full SCCs	FULLSCC_ONLY	All sectors	All programs	Y
Zip merged model-ready files	GZIP_OUTPUTS	mrggrid	Run script	Y
Use hour-specific emission: 2007 and 2020 base cases	HOUR_SPECIFIC_YN	avefire, ptipm	smkinven	N
Use hour-specific emission: 2007 evaluation case	HOUR_SPECIFIC_YN	ptipm	smkinven	Y
Use hourly plume rise data	HOURLY_FIRE_YN	ptfire	Laypoint	Y
Prefix for PTHOUR file names	HOURLY_PREFIX	ptipm	Run script	HOUR_UNIT
Basis for hourly MET temporal profiles	HOURLY_TPROF_BASE	ag, nonpt, othar	Temporal	MONTH
Run in inline mode	INLINE_MODE	All sectors	Run script	both
Run in inline mode c3marine	INLINE_MODE	c3marine, ptfire	Run script	only
I/O API Sphere type	IOAPI_ISPH	All sectors	Grdmat	20
Soil type variable for Pleim-Xiu	ISLTYP_VAR	beis	Tmpbeis3	SLTYP
Separate refueling sectors for onroad?	KEEP_RFL_SEPARATE	onroad	Mrggrid	
Separate refueling sectors for onroad?	KEEP_RFL_SEPARATE	onroad_rfl	Mrggrid	Y
Temporal type	L_TYPE	All sectors	Run script	mwdss
Temporal type	L_TYPE	ag, avefire, beis, nonpt, onroad, onroad_rfl, ptfire, ptipm	Run script	all

Parameter Name	Environment Variable	Sector(s)	Program	Value
Temporal type	L_TYPE	c3marine	Run script	aveday
Temporal type	L_TYPE	afdust, onroad_ca, othar, othon	Run script	week
Merge type	M_TYPE	All sectors	Run script	mwdss
Merge type	M_TYPE	c3marine	Run script	aveday
Merge type	M_TYPE	afdust, othar, othon, onroad_ca	Run script	week
Merge type	M_TYPE	ag, avefire, beis, nonpt, onroad, onroad_rfl, ptfire, ptipm	Run script	all
MCIP name abbreviation	MCIPNAME	All sectors	All programs	MCIP_v3.6
Don't use memory optimization	MEMORY_OPTIMIZE_YN	onroad, onroad_rfl	movesmrg	N
SMOKE-MOVES processing mode, RPP	MOVES_TYPE	onroad	All programs	RPP
SMOKE-MOVES processing mode, RPD	MOVES_TYPE	onroad, onroad_rfl	All programs	RPD
SMOKE-MOVES processing mode, RPV	MOVES_TYPE	onroad, onroad_rfl	All programs	RPV
Custom merge output - MOVES	MOVESMRG_CUSTOM_OUTPUT	onroad, onroad_rfl	movesmrg	Y
Merge by day	MRG_BYDAY	c3marine, ptnonipm, othpt, c3marine	Smkmerge	P
Include market penetration	MRG_MARKETPEN_YN	All sectors	Smkmerge	N
Output county totals	MRG_REPCNY_YN	All sectors	Smkmerge	N
Output county totals	MRG_REPCNY_YN	onroad, onroad_rfl	Smkmerge	Y
Output SCC totals	MRG_REPSCC_YN	onroad, onroad_rfl	Smkmerge	Y
Output county/SCC totals	MRG_REPSRC_YN	onroad, onroad_rfl	Smkmerge	Y
Output state totals	MRG_REPSTA_YN	All sectors	Smkmerge	Y
Output state totals	MRG_REPSTA_YN	onroad, onroad_rfl	Smkmerge	N
Count of underscores for Daily data prefix	NAMEBREAK_DAILY	ptipm	Run script	8
Count of underscores for Hourly data prefix	NAMEBREAK_HOURLY	ptipm	Run script	4
Don't speciate zero emission SCCs	NO_SPC_ZERO_EMIS	ag, nonpt, ptnonipm	Spcmat	Y
Nonhap Type	NONHAP_TYPE	All sectors	All programs	VOC
Nonhap Type	NONHAP_TYPE	onroad, onroad_rfl	All programs	TOG
Model output format	OUTPUT_FORMAT	All sectors	Run script	CMAQ v4.7 N1c
Output time zone	OUTZONE	All sectors	All programs	0
Platform name	PLATFORM	All sectors	All programs	v5
Don't use pollutant conversion	POLLUTANT_CONVERSION	onroad, onroad_rfl	Spcmat	N
Use pollutant conversion	POLLUTANT_CONVERSION	All sectors	Spcmat	Y
Pressure variable name	PRES_VAR	beis	Tmpbeis3	PRSFC
Pleim-Xiu land surface used?	PX_VERSION	beis	Tmpbeis3	Y
Radiation/cloud variable name	RAD_VAR	beis	Tmpbeis3	RGRND
Check for duplicate sources	RAW_DUP_CHECK	ptfire	smkinven	N
Check for duplicate sources	RAW_DUP_CHECK	ag, c3marine, nonroad, onroad, onroad_rfl	smkinven	Y
Convective rainfall variable for Pleim-Xiu	RC_VAR	beis	Tmpbeis3	RC
Renormalize temporal profiles	RENORM_TPROF	All sectors	Temporal	Y
Report default profiles used	REPORT_DEFAULTS	All sectors	All programs	Y
Run holidays	RUN_HOLIDAYS	All sectors	Run script	Y
Run holidays	RUN_HOLIDAYS	avefire, c1c2rail, c3marine, onroad_ca, othar, othon, othpt	Run script	N

Parameter Name	Environment Variable	Sector(s)	Program	Value
Run script for Smkmerge annual totals	RUN_PYTHON_ANNUAL	All sectors	Run script	Y
Use area-to-point	SMK_ARTOPNT_YN	c1c2rail	smkinven	N
Use area-to-point	SMK_ARTOPNT_YN	nonpt, nonroad	smkinven	Y
Use average day emissions	SMK_AVEDAY_YN	All sectors	smkinven	N
Default surrogate code	SMK_DEFAULT_SRGID	All sectors	Grdmat	100
Default surrogate code	SMK_DEFAULT_SRGID	afdust	Grdmat	340
Emission rate model	SMK_EF_MODEL	onroad, onroad_rfl	movesmrg	MOVES
Number of emissions layers	SMK_EMLAYS	All sectors	All programs	24
Maximum errors printed	SMK_MAXERROR	All sectors	All programs	10000
Maximum warnings printed	SMK_MAXWARNING	All sectors	All programs	10
Maximum warnings printed	SMK_MAXWARNING	onroad, onroad_rfl	All programs	200
Plume-in-grid method	SMK_PING_METHOD	All sectors	All programs	0
Use NHAPEXCLUDE file	SMK_PROCESS_HAPS	avefire, ptnonipm	All programs	N
Use NHAPEXCLUDE file	SMK_PROCESS_HAPS	c1c2rail, nonpt, nonroad	All programs	PARTIAL
Use NHAPEXCLUDE file	SMK_PROCESS_HAPS	c3marine, onroad, onroad_rfl	All programs	ALL
Laypoint uses Elevpoint to set sources for plume rise calc	SMK_SPECELEV_YN	All sectors	Laypoint	Y
Formula for Smkinven	SMKINVEN_FORMULA	nonroad	smkinven	EXH__PMC=EXH__PM10-EXH__PM2.5
Formula for Smkinven	SMKINVEN_FORMULA	All sectors	smkinven	PMC=PM10-PM2.5
Custom merge output	SMKMERGE_CUSTOM_OUTPUT	All sectors	Smkmerge	Y
Soil temperature variable for Pleim-Xiu	SOILT_VAR	beis	Tmpbeis3	SOIT1
Soil moisture variable for Pleim-Xiu	SOIM1_VAR	beis	Tmpbeis3	SOIM1
Sort inventory EVs by letter	SORT_LIST_EVS	avefire, ptipm, othpt	Run script	Y
Speciation type name	SPC	All sectors	All programs	cmaq_cb05_soa
Spinup Duration	SPINUP_DURATION	c3marine, nonpt, nonroad, othpt, ptipm, ptnonipm	All programs	0
Spinup Duration	SPINUP_DURATION	All sectors	All programs	10
Temperature bin buffer	TEMP_BUFFER_BIN	onroad, onroad_rfl	movesmrg	0
Temperature variable name	TMPR_VAR	beis	Tmpbeis3	TEMP2
Temperature variable name - MOVES	TVARNAME	onroad, onroad_rfl	movesmrg	TEMP2
Use hourly SPEED profiles	USE_HOURLY_SPEEDS	onroad, onroad_rfl	movesmrg	Y
Don't speciate by road/vehicle type only: SMOKE V3.0	USE_MCODES_SCC_YN	onroad, onroad_rfl	Spcmat	N
Western hemisphere?	WEST_HSPHERE	All sectors	smkinven	Y
Write zero emissions	WRITE_ANN_ZERO	ptfire, ptipm	smkinven	Y
Zip POUT and INLN output files	ZIPOUT	c3marine, ptfire, ptipm, ptnonipm	Run script	Y
Zip POUT and INLN output files	ZIPOUT	othpt	Run script	N

Appendix H: Future Animal Population Projection Methodology, Updated 07/24/12

In the EPA's ammonia inventory for animal agricultural operations (National Emission Inventory - Ammonia Emissions from Animal Agricultural Operations; Revised Draft Report; April 22, 2005), population projections for the beef, dairy, swine, and poultry animal sectors were developed and used to estimate future ammonia emissions from these animal sectors. To develop the 2005 population projections, EPA used inventory data from the U.S. Department of Agriculture (USDA) and the Food and Agriculture Policy and Research Institute (FAPRI).

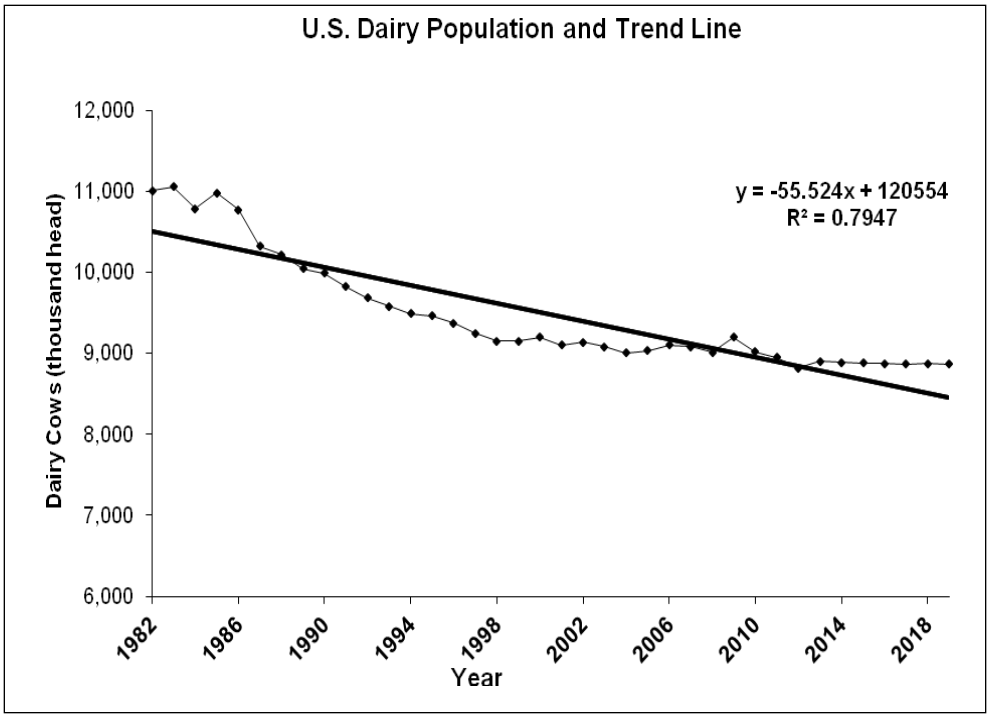
Since completion of the 2005 ammonia emissions inventory, USDA and FAPRI have released updated reports that contain animal population data and projections. These data were used to update the 2005 animal inventory projections.

The data sources and the methodology used to develop the population projections for each animal type are discussed below. These future projections do not account for any changes in animal populations or regional dislocations associated with EPA's revised effluent limitations guidelines and standards for concentrated animal feeding operations promulgated in December 2002 (68 FR 7176, February 12, 2003). Due to insufficient data, animal population projections and future emission estimates were not developed for sheep, goats, and horses.

Dairy Cattle. The 2010 FAPRI *U.S. and World Agricultural Outlook* (FAPRI 2010) report provides estimated national milk cow inventory data and projections from 2009 through 2019 and shows an overall decline in U.S. dairy cow populations. The FAPRI projections depict an essentially linear relationship between 2001 milk cow populations and subsequent years. The EPA estimated future dairy cattle populations using a linear regression analysis of the national population data available from the FAPRI report, covering 1982 through 2019. Figure H-1 illustrates the linear projection of the U.S. dairy cow population and trend line.

Beef Cattle. The USDA *Agricultural Projections to 2021* (USDAa) provides estimated national cattle inventory data and projections from 2010 through 2021. Beef production has a clear cycle generated by producers' expectations about future prices, grain market cycles, and other economic conditions. The pace of the cycle is limited by the reproductive capacity of the animal. Cattle inventories can expand only as fast as cows can reproduce. This has historically resulted in a 7- to 12-year cycle, from peak to peak (Kohls, 1998). Peaks and troughs of the cycle are 5 to 6 percent higher or lower than the general trend in cattle populations so the stage of the cycle can make a significant difference in population at any given future date.

Figure H-1. Dairy Cow Inventory Projections

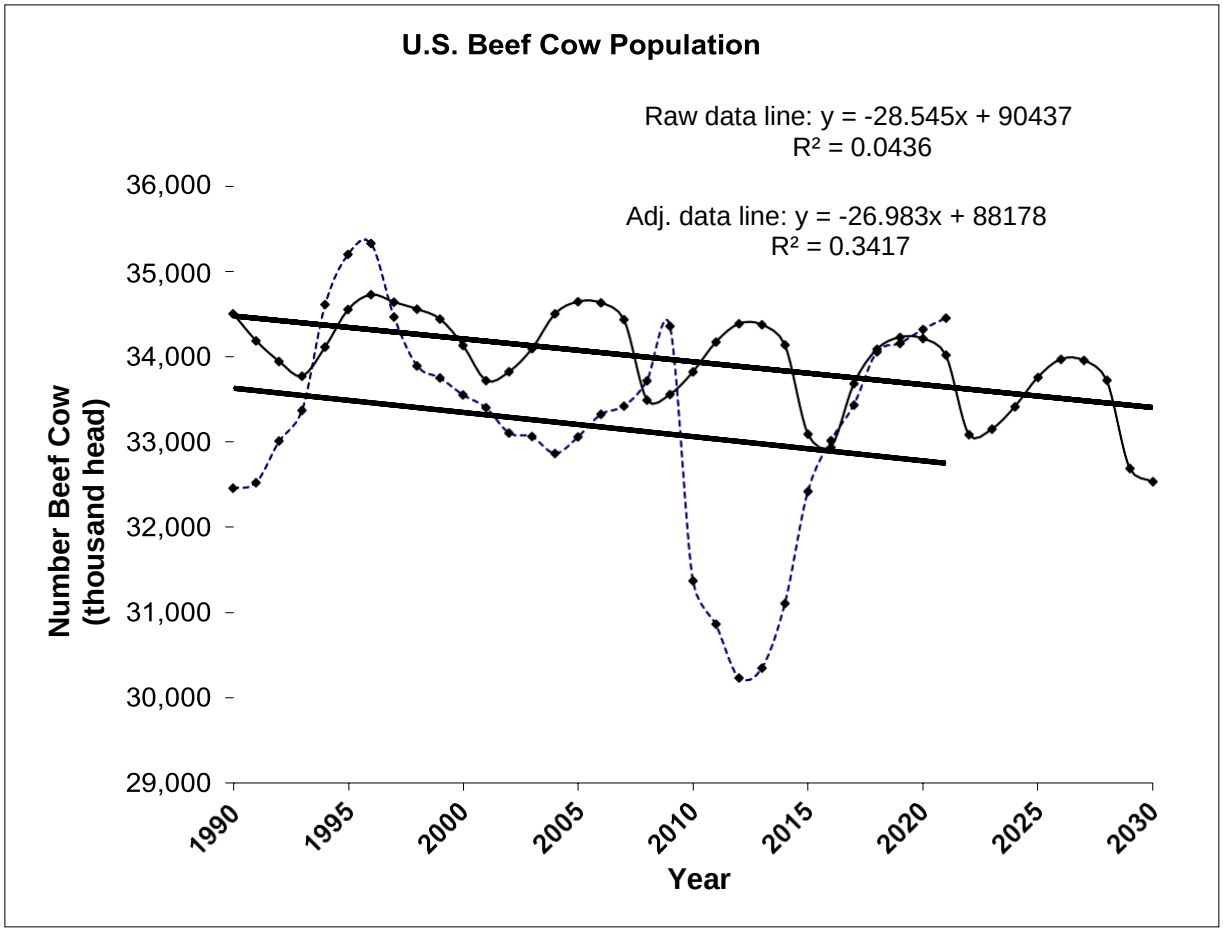


The EPA decomposed the beef cow inventory time series into a trend line, a cyclical component, and a random error component (Bowerman, 1987). The trend line was estimated by linear regression of the inventory data from 1990 to 2015 on a time variable. The cyclical component was then estimated as the percentage deviation from the trend line in the historical data. A graph of that information appeared to show a cyclic trend (trough to peak). The robust U.S. economy of the 1990s may explain the longer than average cycle. With so little data, EPA assumed the down side of the cycle was symmetrical with the up side, so the data set would contain three values for each stage of the cycle. The average of the absolute value of the three observations represents the cyclical component. The EPA forecasted the trend line out to 2030 and adjusted it by the average percentage deviation from the trend for that stage of the cycle, as illustrated in Figure H-2.

The projection data for the beef cattle inventory show some difference in growth cycle of beef cows versus other beef cattle (e.g., steers, bulls). The EPA conducted a separate analysis of these animal populations. Other beef cattle populations appear to follow similar cycles and were forecasted using the same technique as beef cows (see Figure H-3).

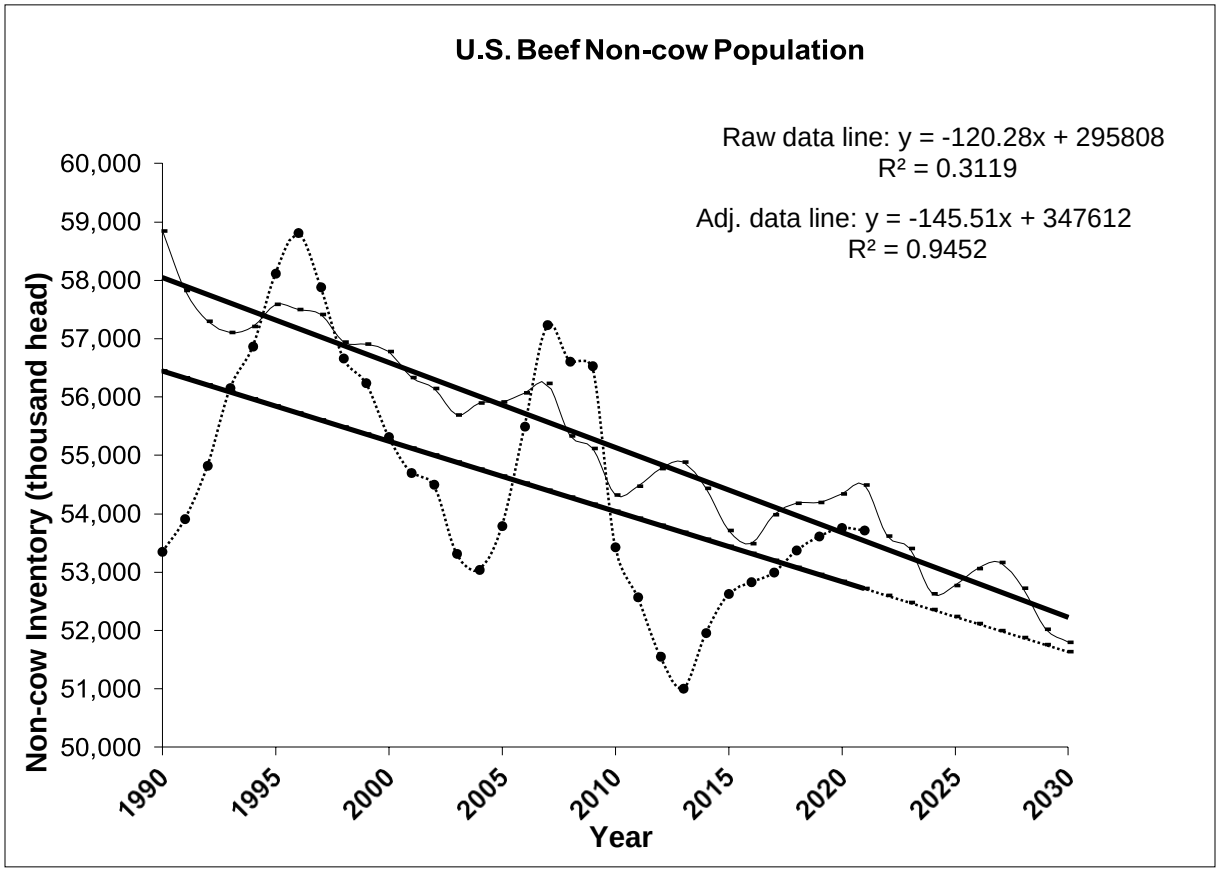
Swine. Annual swine populations are categorized by breeding and market swine. The 2010 FAPRI *U.S. and World Agricultural Outlook* (FAPRI 2010) report presents annual inventory data and projections from 2009 through 2019 for breeding swine and market swine inventories (rather than a combined total). The FAPRI data show an overall increase in swine production over time. Due to increasing productivity (i.e., increased number of pigs per litter), the population of breeding swine is expected to decline over the long term.

Figure H-2. Beef Cow Inventory Projections



The EPA estimated future swine populations using a cycle and trend decomposition analysis. Breeding and market swine population projections and inventory data from the FAPRI report capture the variability of the swine production cycle. Changes in the pork industry in the 1990's have made recent data atypical and inconsistent. For example, EPA replaced the 1996 market hog cyclical deviation with the average of all of the other data because it was so far out of line with the hog cycle.

Figure H-3. Non-cow Beef Inventory Projections



The EPA estimated the trend and deviations from the trend as in the beef cattle analysis. However, it was not possible to apply the identical technique from the beef cattle industry to the hog industry because a well-defined periodic cycle was not evident in the annual data. The EPA evaluated a 3-year moving average of the deviation to further reduce the random component. As the smoothed cycle continued to appear irregular, EPA assumed that the 2010's will repeat the pattern of the 1990's. Breeding hog populations were estimated using a similar approach. See Figures H-4 and H-5 for an illustration of the swine projections for the market hog and breeding hog inventories, respectively.

Poultry. Annual poultry populations in the EPA's ammonia emissions inventory for animal agriculture are presented for broilers, turkeys, and layers. To project poultry populations, EPA used population and projection data from the annual summary of the USDA/NASS *Poultry – Production and Value* reports (USDAb) for broilers and turkeys, and the *Chickens and Eggs* reports (USDAc). With these data, EPA used a linear regression analysis to predict the number of birds produced in the U.S. for years beyond 2011. Figures H-6 and H-7 present the population projections for broilers and turkeys, respectively. Figure H-8 shows the population projections for egg layers.

Figure H-4. Market Hog Inventory Projections

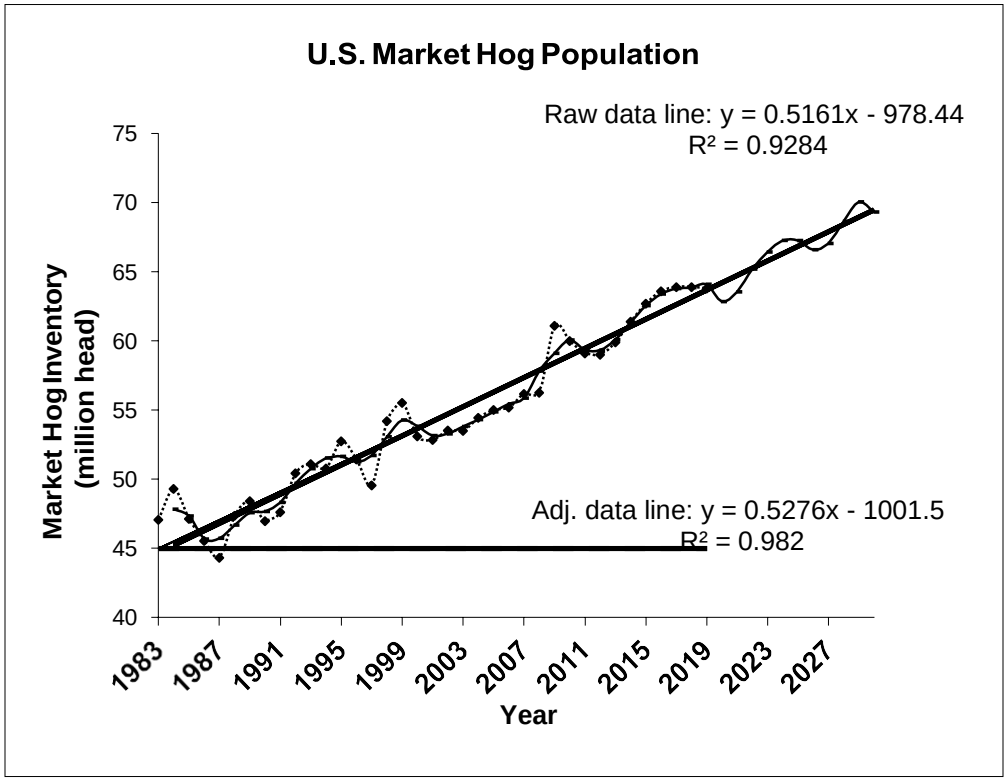


Figure H-5. Breeding Hog Inventory Projections

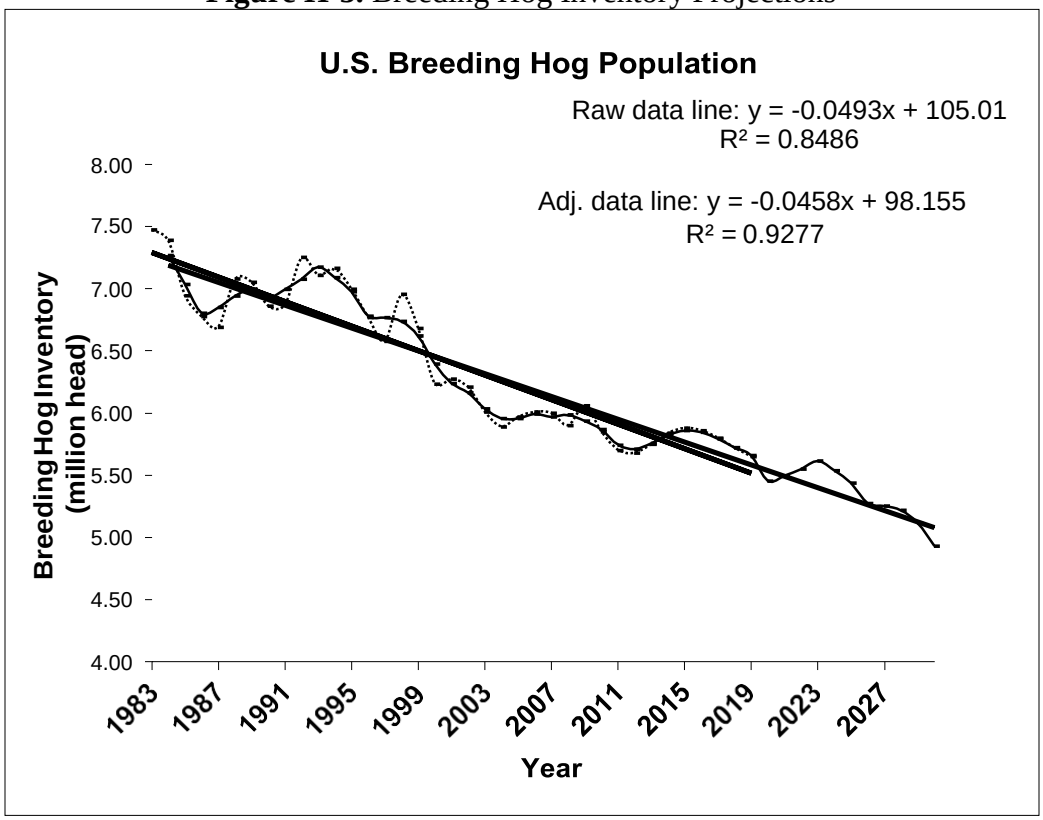


Figure H-6. Broiler Inventory Projection

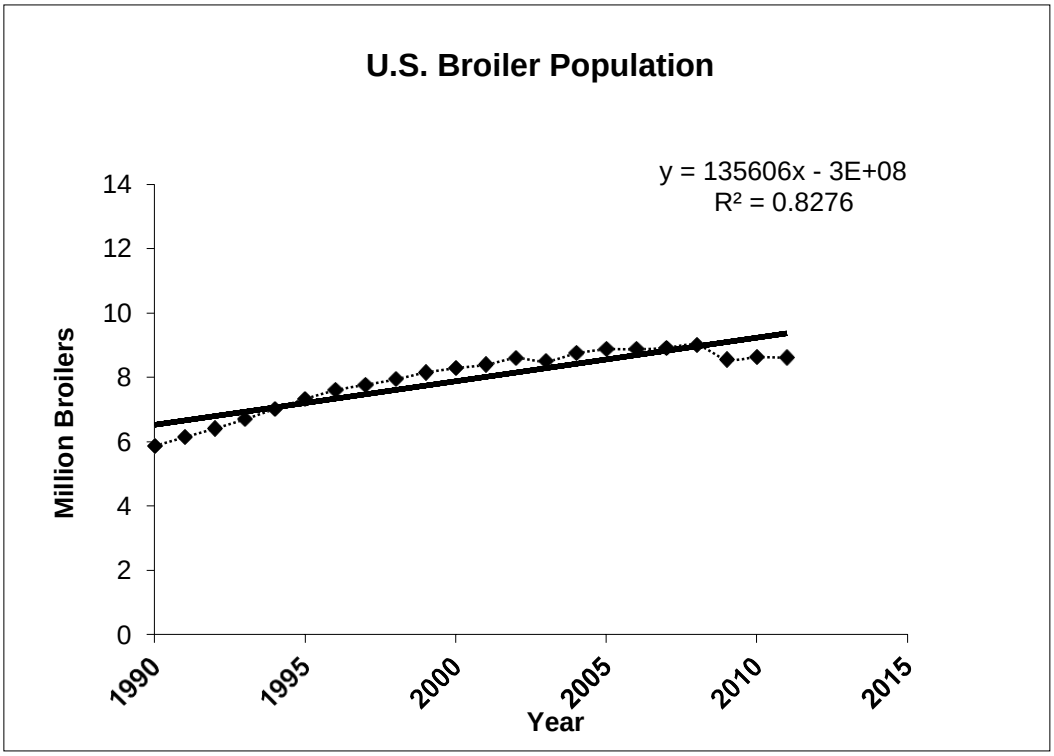


Figure H-7. Turkey Inventory Projection

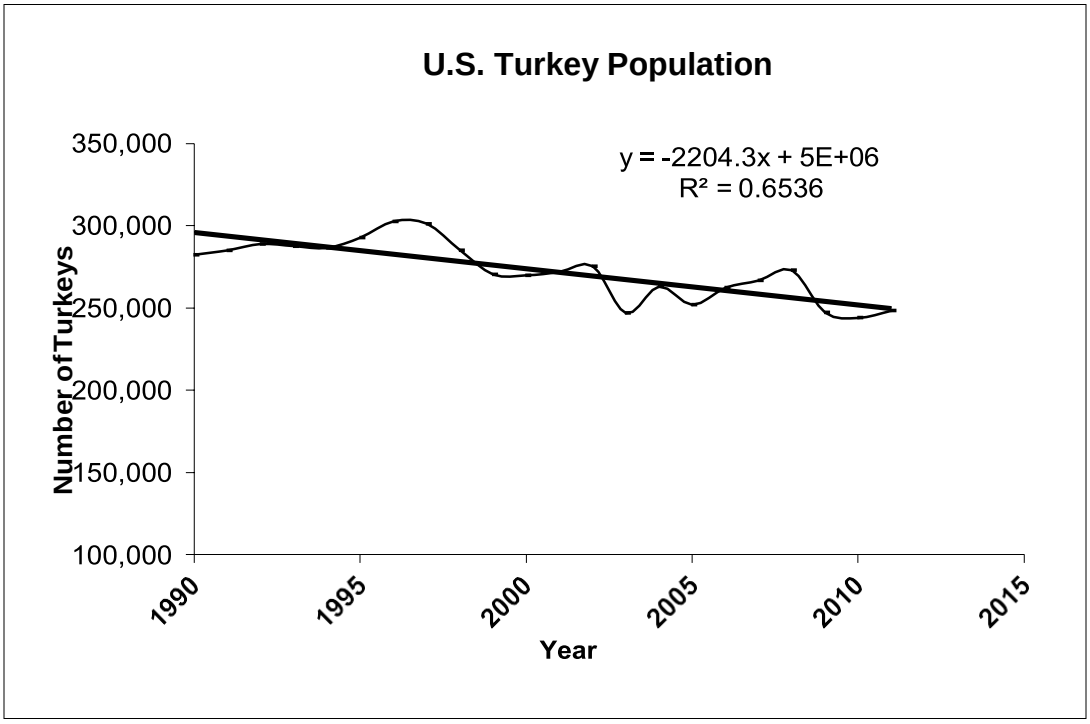
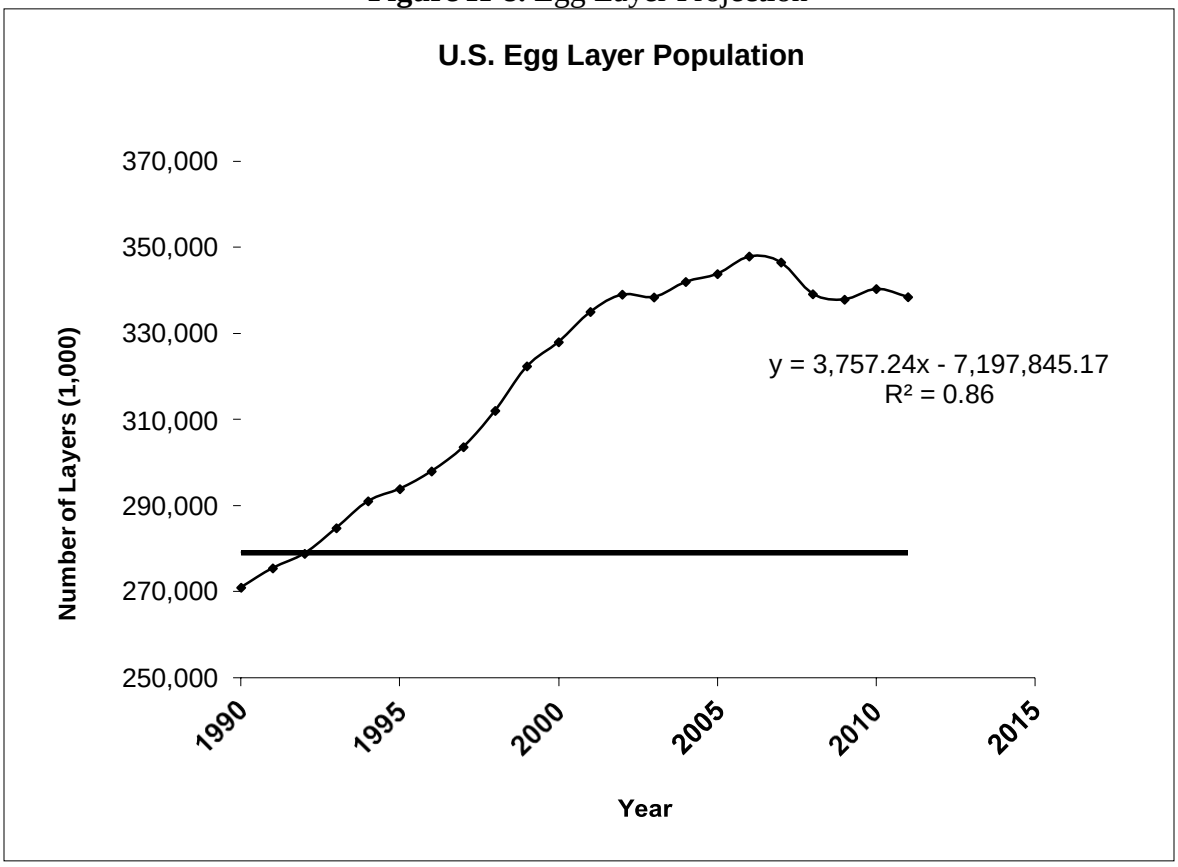


Figure H-8. Egg Layer Projection



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Appendix I: Approach to Apply RICE reductions to project 2008 Emissions in the 2007v5 modeling Platform: 2004 and 2010 rules and 2012 RICE NESHAP Reconsideration Amendments

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1. Introduction

There are three rulemakings for National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reciprocating Internal Combustion Engines. These rules reduce hazardous air pollutant (HAPs) from existing and new stationary reciprocating internal combustion engines (RICE). In order to meet the standards, existing sources with certain types of engines will need to install controls. In addition to reducing HAPs, these controls also reduce criteria air pollutants (CAPs).

This document presents a methodology for incorporating the CAP reductions from the three RICE NESHAPs and 2012 Reconsideration Amendments in the future year projection of the 2007 v5 modeling platform. The methodology was developed for future year 2020; however, by 2014, all 3 rules' compliance dates have passed; thus all 3 rules are included in the emissions projection.

The rules are listed below:

- National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines; Final Rule (69 FR 33473) published 06/15/04
- National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines; Final Rule (FR 9648) published 03/03/10
- National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines; Final Rule (75 FR 51570) published 08/20/2010

The difference among these three rules is that they focus on different types of engines, different facility types (major for HAPs, versus area for HAPs) and different engine sizes based on horsepower (HP). In addition, they have different compliance dates. We project CAPs from the 2008v2 NEI RICE sources, based on the requirements of the rule for **existing sources**, We consider only existing sources, since the inventory includes only existing sources and the current projection approach does not estimate emissions from new sources. Table 1-1summarizes the rule information that was used for the emissions projection. All rules are assumed to be promulgated by the end of 2013.

Table 1-1. Summary of Existing Source RICE Reductions Reflected in the Projection Methodology

Engine Type	Control and Pollutant Reductions	Horse Power Range Affected (Existing Sources Only)	RICE NESHAP Published	Compliance Date	Existing Source Reductions, Rule Documentation
Spark Ignition: Four stroke rich burn (SI: 4SRB)	Non-selective catalytic reduction 97% NO_X, 49% CO * 76% VOC	Non-emergency, Major, HP > 500	06/15/04	06/15/07	CO: 98,040 NO_X: 69,862 VOC:1461***
SI: 4SRB	Same as above	Non-emergency, Area, HP >500	08/20/10	10/19/13	NO_X: 96,479 CO: 109,321 VOC: 30,907
SI: Four stroke lean burn (4SLB)	Oxidation Catalyst 94% CO, 71% VOC	Non-emergency Major, 100-500 HP, Area > 500 HP	08/20/10	10/19/13	
Compression Ignition (CI)	Oxidation Catalyst 70% CO and VOC 30% $PM_{2.5}$	Non-emergency Major and Area, HP >300	03/03/10	05/03/13	CO: 14,342 VOC: 27,395 PM: 2,844

*% CO used in 6/2004 rule was 90%
**Total Reductions across these rules: NO_X (tons)= 166,379; CO (tons) = 221,703; VOC (tons) = 58,402; and PM (tons) = 2,844.
*** VOC reductions weren't estimated for the 2004 rule. Used 2010 approach: estimated the VOC emissions as a function of the HAP emissions by dividing HAP by 0.1944 to get the VOC emissions.

Based on analyses done in support of the rules, the RICE NESHAP published 06/15/04 estimated 69,862 tons of NOX would be reduced, and the RICE NESHAP published 08/20/10 estimates 96,479 tons NO_X to be reduced. Total NO_X to be reduced from existing sources for the two rules is therefore 166,379 tons. The sum of reductions for all rules for CO is 221,703; for VOC is 58,402 and for PM is 2,844.

Our projection approach generally tries to maintain the percent reductions for a category rather than match the absolute mass of the reductions. This is because the inventories used to estimate reductions from the rules are often inconsistent with the inventories that we use for modeling. The rule-specific inventories generally come from industry survey data, and the NEI comes from state-reported data. So, rather than attempting to remove the tonnages listed in above, we used a percent reduction approach.
The percent reduction approach is to determine and apply the appropriate percent reductions to RICE sources in the modeling platform. RICE emissions are identified based on the source classification codes (SCCs) in the modeling inventory. As explained earlier, because the modeling inventory was not used as the basis for determining the air impacts of the rule, the tonnage reductions achieved by applying percent reductions associated with the RICE requirements to the platform are not expected to provide exactly the values cited above.

The percentage reduction to be applied is determined as a function of the efficiency of the control device, and the fraction of emissions in the SCC estimated to be impacted by the rule requirements. The remainder of this document presents the data and equations used to estimate the overall percent reductions to apply to each SCC. The inventory analysis described in this document was based on the 2005 NEI. The resulting 2010 Final Rule RICE reductions described in the following sections were applied as-is for the 2007

platform (2008 NEI-based) projections with the following key exception: the 2012 RICE Reconsideration Amendments were included.
The Reconsideration Amendments are documented in an EPA memorandum (docket EPA-HQ-OAQ-2008-0708-0329) and greatly decrease the CO, NO_X and VOC emission reductions from spark ignition (SI) sources. The RICE Reconsideration Amendments allow for alternative compliance options and management practices for existing stationary engines and allow for some use of stationary emergency area source RICE to be used for peak shaving.

Section 2 discusses the source coverage as a function of the inventory SCCs. Sections 3 and 4 present the data used to determine the percentage of emissions from these SCCs to apply the control device efficiencies. Section 5 discusses the approach for addressing the already controlled engines, and Section 6 provides the equations for percent reduction, and summarizes the values of the parameters used to compute the percent reduction by pollutant and by engine type for years past 2014; Section 7 provides this information for the 2012 projection year which includes reductions only from the rule published in 2004. Section 8 provides the approach for including the impact of ULSD limits on RICE sources. Section 9 provides a summary of the results.

2. Source Coverage

The engine types affected by the NESHAP are Spark Ignition (SI) and Compression Ignition (CI). Spark Ignition engines can be classified as Four Stroke Rich Burn Engines (4SRB), Two Stroke Lean Burn Engines (2SLB) and Four Stroke Lean Burn Engines (4SLB). Because the requirements of the rules differ between SI engine types, we must be able to distinguish among these types in the inventory.

The inventory source classification codes (SCCs) that represent SI and CI engines in the NEI are shown in Table 2-1, along with emissions (50-state sums) from the 2005 modeling platform (Clearinghouse for Inventories and Emissions Factors (CHIEF). The SI SCCs are assigned to one of five "reduction" categories depending upon the specificity of the type of SIC engine. These are: 4SRB, 4SLB, 2SLB and "SI, generic", "boiler + engine" and "RICE + turbine." Note that all of the gasoline engines are considered to be 100% 4SRB. A method and data to apportion the fraction ofemissions from the non-specific engine type categories of "SI, generic", "boiler+engine" and "RICE+turbine" to 4SRB and 4SLB engine types is presented in the next section. The CI SCCs only need to be apportioned to non- emergency engines, and not by any specific CI engine type, therefore the "Category for Application of Reduction" is CI.

There are also SCCs in the inventory for oil and gas operations that include emissions from the use of RICE. We denote these as "oil&gas" in Table 2-1. We do not have any data to apportion the amount of emissions from SI nor CI RICE from these SCCs. Focusing on NO_X reductions, we can determine the amount of NO_X reductions needed from the oil&gas SCCs in order to bring the total NO_X to equal the estimates provided in the rule. The total NO_X reductions from the non oil&gas SCCs sum to 80,597 tons and the total NO_X reductions estimated by the two rules is 166,379 tons. If the remaining NO_X from oil&gas SCCs were to make up this difference, 26% of the total oil&gas NO_X would need to be reduced. Since this fraction turns out higher than the fraction of reduction to be applied to "SI, generic" SCCs, and it is expected that oil&gas SCCs would have more NO_X emitting operations than the "SI,generic" SCCs, we have chosen to apply the "SI, generic" SCC fraction to the oil&gas SCCS. Because it is likely that the vast majority of oil&gas VOC is from operations other than RICE, we will not compute any VOC reduction from oil&gas SCCs. We will use the same fraction as "SI,generic" for CO. The 2008 NEI includes many of the same SCCs as the 2005 NEI listed here in Table 2-1. When modifying the CONTROL packet for the 2007 platform, we made sure to include any/all RICE-related SCCs that were in the 2008 NEI that were not included in the 2005 NEI. It was more common to find SCCs in the 2005 NEI that were not used in the 2008 NEI however.

Table 2-1. SCCs (tons) representing the 2005 NEI point source and non-point source universe of RICE

SCC	Description	Engine Type	Category for Application of Reduction	NO_X	CO	VOC	$PM_{2.5}$
20100102	Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating	CI	CI	17,662	3,792	1,294	645
20100105	Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating: Crankcase Blowby	CI	CI	87	22	10	9
20100107	Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating: Exhaust	CI	CI	221	79	9	10
20100202	Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating	SI	SI, generic	7,490	3,675	909	115
20100207	Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating: Exhaust	SI	SI, generic	1	0	0	0
20200102	Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating	CI	CI	11,785	3,323	908	772
20200104	Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating: Cogeneration	CI	CI	494	128	18	31
20200107	Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating: Exhaust	CI	CI	254	74	15	7
20200202	Internal Combustion Engines;Industrial;Natural Gas;Reciprocating	SI	SI, generic	215,888	74,610	16,560	2,339
20200204	Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Cogeneration	SI	SI, generic	704	413	110	14
20200207	Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Exhaust	SI	SI, generic	15	50	1	0
20200252	Internal Combustion Engines;Industrial;Natural Gas;2-cycle Lean Burn	SI	2SLB	153,857	27,103	9,089	2,216
20200253	Internal Combustion Engines;Industrial;Natural Gas;4-cycle Rich Burn	SI	4SRB	66,871	53,724	5,337	512
20200254	Internal Combustion Engines;Industrial;Natural Gas;4-cycle Lean Burn	SI	4SLB	47,932	20,287	5,333	385
20200255	Internal Combustion Engines;Industrial;Natural Gas;2-cycle Clean Burn	SI	2SLB	591	288	70	22
20200256	Internal Combustion Engines;Industrial;Natural Gas;4-cycle Clean Burn	SI	4SLB	1,719	1,924	365	29
20200301	Internal Combustion Engines;Industrial;Gasoline;Reciprocating	SI	4SRB	660	1,966	110	26
20200307	Internal Combustion Engines;Industrial;Gasoline;Reciprocating: Exhaust	SI	4SRB	56	54	9	3
20201001	Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Propane: Reciprocating	SI	SI, generic	101	130	52	9
20201002	Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Butane: Reciprocating	SI	SI, generic	13	22	0	0
20201702	Internal Combustion Engines;Industrial;Gasoline;Reciprocating Engine	SI	4SRB	3	31	9	0

SCC	Description	Engine Type	Category for Application of Reduction	NO_X	CO	VOC	$PM_{2.5}$
20201707	Internal Combustion Engines;Industrial;Gasoline;Reciprocating: Exhaust	SI	4SRB	0	4	0	0
20300101	Internal Combustion Engines;Commercial/Institutional;Distillate Oil	CI	CI	4,476	1,512	455	330
20300105	Internal Combustion Engines;Commercial/Institutional;Distillate Oil	CI	CI	0	0	0	0
20300107	Internal Combustion Engines;Commercial/Institutional;Distillate Oil	CI	CI	9	1	0	6
20300201	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating	SI	SI, generic	17,532	6,165	1,883	113
20300204	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Cogeneration	SI	generic	170	200	22	4
20300207	Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Exhaust	SI	SI, generic	17	2	1	0
20300301	Internal Combustion Engines;Commercial/Institutional;Gasoline;Reciprocating	SI	4SRB	348	4,250	245	80
20300307	Internal Combustion Engines;Commercial/Institutional;Gasoline;Reciprocating:	SI	4SRB	4	21	3	-
20301001	Internal Combustion Engines;Commercial/Institutional;Liquified Petroleum Gas	SI	SI, generic	61	28	12	2
20301002	Internal Combustion Engines;Commercial/Institutional;Liquified Petroleum Gas	SI	SI, generic	0	0	0	-
20400401	Internal Combustion Engines;Engine Testing;Reciprocating Engine;Gasoline	SI	4SRB	647	11,538	738	44
20400402	Internal Combustion Engines;Engine Testing;Reciprocating Engine;Diesel/Kerosene	CI	CI	3,935	968	235	163
20400403	Internal Combustion Engines;Engine Testing;Reciprocating Engine;Distillate Oil	CI	CI	2	1	0	0
31000203	Industrial Processes;Oil and Gas Production;Natural Gas Production;Compressors	SI	SI, generic	29,605	10,849	2,333	272
50100421	Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Recovery: Internal Combustion Device	SI	SI, generic	914	1,220	103	53
2101004000	Stationary Source Fuel Combustion;Electric Utility;Distillate Oil;Total: Boilers and IC Engines	CI	Boiler+engine	258	60	4	1
2101004002	Stationary Source Fuel Combustion;Electric Utility;Distillate Oil;All IC Engine Types	CI	CI	2,218	462	112	9
2101006000	Stationary Source Fuel Combustion;Electric Utility;Natural Gas;Total: Boilers and IC Engines	SI	Boiler+engine	2,413	4,500	1,294	8
2101006002	Stationary Source Fuel Combustion;Electric Utility;Natural Gas;All IC Engine Types	SI	RICE+turbine	6,089	1,347	52	148
2102004000	Stationary Source Fuel Combustion;Industrial;Distillate Oil;Total: Boilers and IC Engines	CI	Boiler+engine	89,906	20,956	3,223	6,494
2102006000	Stationary Source Fuel Combustion;Industrial;Natural Gas;Total: Boilers and IC Engines	SI	Boiler+engine	150,642	99,171	6,733	775

SCC	Description	Engine Type	Category for Application of Reduction	NO_X	CO	VOC	$PM_{2.5}$
2102006002	Stationary Source Fuel Combustion;Industrial;Natural Gas;All IC Engine Types	SI	RICE+turbine	14,845	5,791	1,543	9
2103004000	Stationary Source Fuel Combustion;Commercial/Institutional;Distillate Oil;Total:	CI	Boiler+engine	43,266	10,520	1,340	6,461
2103006000	Stationary Source Fuel Combustion;Commercial/Institutional;Natural Gas;Total:	SI	Boiler+engine	138,027	95,914	8,684	933
2199004000	Stationary Source Fuel Combustion;Total Area Source Fuel Combustion;Distillate Oil;Total: Boilers and IC Engines	CI	Boiler+engine	199	210	12	15
2199004002	Stationary Source Fuel Combustion;Total Area Source Fuel Combustion;Distillate Oil;All IC Engine Types	CI	RICE+turbine	11,327	5,227	1,158	797
2199006000	Stationary Source Fuel Combustion;Total Area Source Fuel Combustion;Natural Gas;Total: Boilers and IC Engines	SI	Boiler+engine	2,592	600	124	166
2310020600	Industrial Processes;Oil and Gas Exploration and Production;Natural Gas;Compressor Engines	SI	SI, generic	48,393	29,980	5,300	-
2310000000	Industrial Processes;Oil and Gas Production: SIC 13;All Processes;Total: All Processes	oil&gas		14,456	2,654	26,308	-
2310000220	Industrial Processes;Oil and Gas Exploration and Production;All Processes;Drill Rigs	oil&gas		85,302	26,575	5,579	2,945
2310000440	Industrial Processes;Oil and Gas Exploration and Production;All Processes;Saltwater Disposal Engines	oil&gas		121	17	7	-
2310001000	Industrial Processes;Oil and Gas Production: SIC 13;All Processes : On-shore;Total: All Processes	oil&gas		193,183	226,478	286,654	-
2310002000	Industrial Processes;Oil and Gas Production: SIC 13;All Processes : Off-shore;Total: All Processes	oil&gas		1,859	-	310	-
2310020000	Industrial Processes;Oil and Gas Production: SIC 13;Natural Gas;Total: All Processes	oil&gas		7,253	3,114	17,584	101
2310023000	Industrial Processes;Oil and Gas Exploration and Production;Natural Gas;Cbm Gas Well - Dewatering Pump Engines	oil&gas		4,104	-	-	-

3. Spark Ignition (SI) Engines

Table 3-1, Table 3-2, and

Table 3-3 provides the distribution of 2005 NEI emissions by source type (major versus area), engine type and HP range for NO_X, CO and VOC, respectively. The data are from the rule analyses and were provided by Melanie King, EPA, Sector Policies and Programs Division. These tables provide the information needed to apportion the emissions from generic reciprocating engine SI SCCs in Table 2-1 to the particular engine type requiring controls. For example, the proportion of NO_X emissions from major 4SRB Non-emergency engines from all major reciprocating engines is 91,657/278,460 = 33%. The emissions in these tables are also broken out by HP; thus they also provide the data needed to apportion the emissions to the HP range requiring the controls. Furthermore, we have used them to create a ratio of major to area emissions for SI engines. We had previously used the NEI's SRCTYPE data field which indicates the facility's status- major versus area- with respect to HAPs (based on the major/area definitions in Section 112 of the Clean Air Act). This approach, which used for the 2016cr1_hg_05 case and related source apportionment case (both of these were used for the Boiler MACT Regulatory Impact Assessment, and no other modeling) resulted in major/area splits heavily weighted to major sources: 77%/23%, 81%/19% and 75%/25% for 4SRB for NO_X, CO and VOC, respectively and 91%/9% for both CO and VOC for 4 SLB. However, we have chosen to update this as we have more confidence in the major/area breakout done for the rule analysis than the value reported in the inventory for which we have discovered errors in the SCRTYPE value or found it missing. Using the data Table 3-1, Table 3-2, and

Table 3-3, we determine that 27% of the emissions are from major sources and 73% are from area sources. This is approximately the same for all pollutants, and we also use it for all SI engine types.

The below subjections provide the apportionment factors for both engine type and HP ranges for the SI engines.

Table 3-1. Distribution of 2005 NEI NO_X by engine and HP type for major and area sources

Baseline NO_X emissions from major and area sources (with 20% 4SRB have NSCR), SI engines												
HP Range	Total NO_X **maj src**	2SLB Non-emergency **-maj src**	4SLB Non-emergency **-maj src**	4SRB Non-emergency **-maj src**	Emergency **-maj src**	Landfill/ Digester Gas Non-emergency **-maj src**	Total NO_X **area src**	2SLB- **area src**	4SLB- **area src**	4SRB- **area src**	Emergency- **area src**	Landfill/ Digester Gas- **area src**
25-50	41,751	12,806	15,054	13,853	38	0	68,566	21,031	24,722	22,750	63	0
50-100	22,363	6,859	8,063	7,420	21	0	58,985	18,092	21,268	19,571	54	0
100-175	64,914	19,911	23,405	21,538	60	0	133,065	40,815	47,978	44,150	123	0
175-300	24,168	7,413	8,714	8,019	22	0	82,359	25,261	29,695	27,326	76	0
300-500	25,106	7,700	9,052	8,330	23	0	99,679	30,574	35,940	33,073	92	0
500-600	19,426	5,825	6,847	6,301	18	436	69,094	19,760	23,228	21,375	59	4,671
600-750	4,097	1,228	1,444	1,329	4	92	14,438	4,328	5,087	4,682	13	327
>750	76,635	22,971	27,002	24,848	71	1744	227,890	68,313	80,303	73,896	210	5,169
Total	**278,460**	**84,713**	**99,581**	**91,637**	**256**	**2,272**	**754,077**	**228,175**	**268,222**	**246,822**	**690**	**10,167**

Table 3-2. Distribution of 2005 NEI CO by engine and HP type for major and area sources

Baseline CO emissions from major and area sources (with 20% 4SRB have NSCR), SI engines												
HP Range	Total CO **maj src**	2SLB Non-emergency **-maj src**	4SLB Non-emergency **-maj src**	4SRB Non-emergency- **maj src**	Emergency- **maj src**	Landfill/ Digester Gas Non-emergency- **maj src**	Total CO - **area src**	2SLB- **area src**	4SLB- **area src**	4SRB- **area src**	Emergency- **area src**	Landfill/ Digester Gas- **area src**
25-50	28,798	3,247	5,131	20,368	51		46,898	5,333	8,031	33,450	83	
50-100	15,425	1,739	2,748	10,910	27		40,344	4,588	6,909	28,776	71	
100-175	44,774	5,049	7,978	31,668	79		91,013	10,350	15,586	64,917	161	
175-300	16,670	1,880	2,970	11,791	29		56,331	6,406	9,646	40,179	100	
300-500	17,316	1,953	3,086	12,248	30		68,178	7,753	11,675	48,629	121	
500-600	13,402	1,477	2,334	9,264	23	303	47,273	5,011	7,546	31,429	78	3,209
600-750	2,826	312	492	1,954	5	64	9,876	1,097	1,653	6,884	17	225
>750	52,851	5,825	9,204	36,535	93	1,194	155,890	17,323	26,086	108,654	275	3,551
Total	**192,062**	**21,482**	**33,944**	**134,738**	**337**	**1,561**	**515,803**	**57,862**	**87,132**	**362,918**	**906**	**6,985**

Table 3-3. Distribution of 2005 NEI VOC by engine and HP type for major and area sources

Baseline VOC emissions from major and area sources (with 20% 4SRB have NSCR), SI engines												
HP Range	Total VOC **maj src**	2SLB Non-emergency-**maj src**	4SLB Non-emergency-**maj src**	4SRB Non-emergency-**maj src**	Emergency-**maj src**	Landfill/ Digester Gas Non-emergency-**maj src**	Total VOC - **area src**	2SLB-**area src**	4SLB-**area src**	4SRB-**area src**	Emergency-**area src**	Landfill/ Digester Gas-**area src**
25-50	5,696	939	3,513	1,240	3.3		9,354	1,543	5,770	2,036	5.4	
50-100	3,051	503	1,882	664	1.8		8,047	1,327	4,964	1,751	4.6	
100-175	8,855	1,460	5,463	1,927	5.1		18,153	2,994	11,198	3,951	10.4	
175-300	3,297	544	2,034	718	1.9		11,235	1,853	6,931	2,445	6.5	
300-500	3,425	565	2,113	745	2.0		13,598	2,242	8,388	2,960	7.8	
500-600	2,650	427	1,598	564	1.5	59	9,415	1,449	5,421	1,913	5.0	627
600-750	559	90	337	119	0.3	12	1,969	317	1,187	419	1.1	44
>750	10,450	1,685	6,302	2,224	6.0	233	31,076	5,010	18,742	6,613	17.8	693
Total	**37,982**	**6,213**	**23,241**	**8,200**	**22**	**305**	**102,846**	**16,736**	**62,600**	**22,088**	**58.7**	**1,364**
Note that this table accounts for changes to VOC baseline values made on August 16, 2010												

Four Stroke Rich Burn Engines (4SRB)

For 4SRB, non-selective catalytic reduction (NSCR) is expected to be required to meet the formaldehyde limit. In addition to reducing NO_X, NSCR reduces CO and VOC. The control device efficiency for NO_X, CO and VOC, denoted $\mathbf{R_{poll}}$, is based on the average value in Table 4 of the memo "CO Removal Efficiency as a Surrogate for HAP Removal Efficiency". For 4SRB, $\mathbf{R_{NOX}}$ = 97%, $\mathbf{R_{CO}}$ = 49%; and $\mathbf{R_{VOC}}$ = 76%

As discussed earlier, the point source inventory source classification codes (SCCs) that represent or could include these engines in the NEI are shown in Table 2-1. To determine the fraction of 4SRB in the "SI, generic" SCCs, we compute the percent of NO_X, CO and VOC emissions from rich burn engines from "baseline estimates" (considering existing controls --- 20% 4SRB have NSCR) of NO_X, CO and VOC from 4SRB. We denote this fraction as $\mathbf{F_{4SRB,\ poll}}$. Using the total NO_X emissions from all SI RICE and 4SRB in Table 3-1, the proportion of NO_X from 4SRB from major source SI engines is computed as 91,637/278,460 = 33% and the proportion of NO_X from 4SRB from area source SI engines is computed as 246,822/754,077 = 33%. Thus, $\mathbf{F_{4SRB,\ NOX}}$ = 0.33. Using Table 3-2, $\mathbf{F_{4SRB,\ CO}}$ = 0.7 (same for both major and area sources) and using

Table 3-3, $F_{4SRB, VOC}$ = 0.216 (same for both major and area sources). As discussed previously, we use the same F_{4SRB} for oil&gas SCCs other than for VOC, for which we use $F_{4SRB, VOC}$ = 0

To apportion the "engine+boiler" SCCs to 4SRB, we use the inventory estimates of boiler and engine emissions stationary RICE, to apportion to "SI, generic" and then use the factors discussed above to apportion to 4SRB. Using the 2005 emission estimates for SCCs associated with natural gas boilers, natural gas RICE and turbine RICE, we compute that 63% of the NO_X are from natural gas RICE, 54% of the CO are from natural gas RICE and 70% of the VOC are from natural gas RICE. Therefore, for engine and boiler SCCs: $F_{4SRB, NOX}$ = 0.63x0.33 = 0.21, $F_{4SRB, CO}$ = 0.54x0.7 = 0.38 and $F_{4SRB, VOC}$ = 0.70x0.216= 0.15.

We apportion "RICE+turbine" SCCs using 2005 Platform emissions as well. In this case, $F_{4SRB, NOX}$ = 0.78x0.33 = 0.26, $F_{4SRB, CO}$ = 0.79x0.7= 0.55 and $F_{4SRB, VOC}$ = 0.89x0.216 = 0.19

The August 2010 regulation requires engines at area sources greater than 500 HP to have NSCR. Major sources that are of that size are subject to limits that require NSCR from the 2004 rule. To determine the fraction of 4SRB emissions that are greater than 500 HP, we use the data in Table 3-1, Table 3-2, and

Table 3-3. Since the size cutoffs and emissions distributions are different for major and area sources, we denote the fraction as $\mathbf{F_{sizecut,major,poll}}$ and $\mathbf{F_{sizecut,area,poll}}$ for major and area sources, respectively. The values from the tables are as follows,
$\mathbf{F_{sizecut,major,NOX}} = \mathbf{F_{sizecut,major,CO}} = \mathbf{F_{sizecut,major,VOC}} = 0.354$ and
$\mathbf{F_{sizecut,area,NOX}} = \mathbf{F_{sizecut,area,CO}} = \mathbf{F_{sizecut,area,VOC}} = 0.405$

Two Stroke Lean Burn Engines (2SLB)

For 2SLB, the only engines that would be required to meet limits based on catalysts would be new (meaning constructed 2003 and later) non-emergency >500 HP at major sources. As a result, we will not apply any reductions to 2SLB in the 2008 NEI.

Four Stroke Lean Burn Engines (4SLB)

These engines will require an oxidation catalyst, which in addition to reducing HAP, reduces CO and VOC. Per information emailed by Melanie King (7/7/2010): For 4SLB, $\mathbf{R_{CO}} = 94\%$; and $\mathbf{R_{VOC}} = 71\%$

To apportion emissions of "SI,generic" SCCs to 4SLB , we use the total CO emissions from all SI RICE and 4SLB in Table 3-1. The proportion of CO from 4SLB from major source SI engines is computed as 33,944 / 192,062 = 18% and the proportion of CO from 4SLB from area source SI engines is computed as 87,132/515,803 = 17%. Since these values are close, we chose 17%. ($\mathbf{F_{4SLB,\,CO}} = 0.17$.) Using Table 3-2, $\mathbf{F_{4SLB,\,VOC}} = 0.61$ (roughly the same fraction for both major and area sources). The $\mathbf{F_{4SLB,\,CO}}$ value also applies to oil&gas SCCs. $\mathbf{F_{4SLB,\,VOC}}$ from oil&gas SCCs =0.

We also need to determine $\mathbf{F_{4SLB,\,CO}}$ and $\mathbf{F_{4SLB,\,VOC}}$ for SCCs with categories of "Boiler+engine" and "RICE+turbine". We can use the same approach as for 4SRB. In this case, for "Boiler+engine" SCCs, $\mathbf{F_{4SLB,\,CO}} = 0.54 \times 0.17 = 0.10$ and $\mathbf{F_{4SLB,\,VOC}} = 0.70 \times 0.61 = 0.43$.
For "RICE+turbine" SCCs: $\mathbf{F_{4SLB,\,CO}} = 0.79 \times 0.17 = 0.13$ and $\mathbf{F_{4SLB,\,VOC}} = 0.89 \times 0.61 = 0.54$.

The August 20, 2010 rule requires existing non-emergency engines 100-500 HP at major sources and existing non-emergency engines >500 HP at area sources to meet limits based on oxidation catalyst. Engines greater than 500 HP at major sources were regulated under the 2004 rule and we didn't put any emission limits on them, and therefore would not need an oxidation catalyst.

To determine the fraction of 4SLB emissions that in those HP ranges, we use the data in Table 3-1, Table 3-2, and

Table 3-3. Since these fractions are different for major and area sources, we denote the fraction as $\mathbf{F_{sizecut,major,poll}}$ and $\mathbf{F_{sizecut,area,poll}}$ for major and area sources, respectively. The values from the tables are as follows,

$\mathbf{F_{sizecut,major,CO}} = \mathbf{F_{sizecut,major,VOC}} = 0.41$ and $\mathbf{F_{sizecut,area,CO}} = \mathbf{F_{sizecut,area,VOC}} = 0.40$

4. Compression Ignition (CI) Engines

Compression ignition engines are not distinguished further (by burn type) as are Spark Ignition. However, the amount of emissions from emergency engines, for which existing engines would not be required to apply oxidation catalyst, is significant relative to non-emergency engines. Therefore the fraction of emissions from non-emergency engines will be applied to all SCCs identified as CI in Table 2-1 in addition to the fraction that will be subject to oxidation catalyst based on the size. Since the regulation that promulgated in March would require non-emergency existing CI engines >300 HP that are located at both major and area sources of HAP to install oxidation catalyst. Since major and area sources have the same requirements, we can use data on the proportion of emissions of the total CI population, presented in Table 4-1. The data are from the rule analyses and were provided by Melanie King, EPA, Sector Policies and Programs Division.

Table 4-1. Distribution of CO, PM and VOC 2005 NEI emissions from Compression Ignition Engines by Engine and HP type for major and area sources

Summary of Major Source and Area Source Baseline Emissions for the RICENESHAP								
Size Range (HP)		Baseline Emissions (tpy)				Baseline Emissions (tpy)		
	Number of Engines - nonemergency	*CO - nonemergency*	*PM - nonemergency*	*VOC - nonemergency*	*Number of Emergency Engines*	*CO emergency*	*PM emergency*	*VOC emergency*
Major Sources								
50-100	18,547	6,454	487	2,010	74,187	1,291	97	402
100-175	24,301	8,457	1,170	4,828	97,206	1,691	234	966
175-300	18,429	6,413	1,532	6,324	73,715	1,283	306	1,265
300-500	9,696	3,374	1,357	5,604	38,785	675	271	1,121
500-600	860	299	165	683	3,438	60	33	137
600-750	440	153	104	429	1,760	31	21	86
>750	971	338	340	1,402	3,882	68	68	280
Total	73,243	25,489	5,155	21,281	292,974	5,098	1,031	4,256
Area Sources								
50-100	27,820	9,681	730	3,015	111,281	1,936	146	603
100-175	36,452	12,685	1,754	7,242	145,808	2,537	351	1,448
175-300	27,643	9,620	2,298	9,486	110,573	1,924	460	1,897
300-600	21,816	7,592	3,436	14,186	87,266	1,518	687	2,837
600-750	3,657	1,273	864	3,567	14,628	255	173	713
>750	6,479	2,255	2,268	9,361	25,914	451	454	1,872
Total	123,867	43,106	11,350	46,857	495,470	8,621	2,270	9,371

Per the rule, there would be 70% reduction of HAP, CO, and VOC and 30% reduction of PM from the catalyst. We also assume that the control achieves the same reduction from $PM_{2.5}$ as PM. There are no NO_X reductions. Therefore, For CI, $\mathbf{R_{CO}} = 70\%$; $\mathbf{R_{VOC}} = 70\%$ and $\mathbf{R_{PM2.5}} = 30\%$.

The fraction of emissions for CO and VOC that are both non-emergency and greater than 300HP are computed from the above Table 4-1

$\mathbf{F_{nonE,sizecut,major,CO}} = 0.14$. $\mathbf{F_{nonE,sizecut,major,VOC}} = \mathbf{F_{nonE,sizecut,major,PM2.5}} = 0.32$

$\mathbf{F_{nonE,sizecut,area,CO}} = 0.40$ $\mathbf{F_{nonE,sizecut,area,VOC}} = \mathbf{F_{nonE,sizecut,area,PM2.5}} = 0.65$

We also need to apportion the fraction of emissions from SCCs with categories of "Boiler+engine" and "RICE+turbine" that are attributed to CI engines. We can use a similar approach as for 4SRB and 4SLB. In this case, we only need to break out CI RICE (and not a type of CI) so we only need the fraction of

"Boiler+engine" emissions that are CI RICE. Using 2005 Platform emissions from diesel SCCs for boilers, RICE and turbine engines, we compute the following fractions to apportion "Boiler+engine" SCCs to CI RICE: $\mathbf{F_{CI,\ CO}}$ = 0.61 and $\mathbf{F_{CI,\ VOC}}$ = 0.84 and $\mathbf{F_{CI,\ PM2.5}}$ = 0.50

For "RICE+turbine" SCCs: $\mathbf{F_{CI,\ CO}}$ = 0.83 and $\mathbf{F_{CI,\ VOC}}$ = 0.92 and $\mathbf{F_{CI,\ PM2.5}}$ = 0.78

5. Approach for Addressing Already-Controlled Sources

Although we know that a certain percentage of engines are already controlled (they set the basis of the MACT floor), we will use the existing control information in the 2008 NEI inventory (and the capability for the software applying the controls to not apply additional controls to already-controlled sources) rather than account for already-controlled sources by pro-rating the percent reduction we apply to all sources. While this approach will overestimate reductions for already-controlled sources that are missing the control information in the inventory, it will be less of an impact than the pro-rating approach which would underestimate the reductions for the uncontrolled sources.

6. Percent Reduction Calculations to be applied to NEI That Account for all Three RICE rules

The next sections provide the calculations and data to determine the percent reductions to apply to the 2007 modeling platform for projecting these emissions to 2014 and beyond. By 2014 all three of the RICE rules' compliance dates have passed.

SI Engines

Table 6-1shows the reduction to be applied to the SI engine SCCs identified in Table 2-1 based on the parameters computed from the baseline emissions in Table 3-1, Table 3-2 and

Table 3-3 and discussed in Section 3. The formula for the percent reduction is provided in the first row:

Table 6-1. Formula for determining the percent reduction to apply to SI SCCs for Projection Years of 2014 and Beyond

$PERCENT\ REDUCTION_{SI,poll} = PERCENT\ REDUCTION_{4SRB,poll} + PERCENT\ REDUCTION_{4SLB,poll}$
Where:
$PERCENT\ REDUCTION_{4SRB,poll} = R_{poll} \times F_{4SRB} \times F_{sizecut,major,poll} \times F_{major,poll} + R_{poll} \times F_{4SRB} \times F_{sizecut,area,poll} \times F_{area,poll}$
$PERCENT\ REDUCTION_{4SLB,poll} = R_{poll} \times F_{4SLB} \times F_{sizecut,major,poll} \times F_{major,poll} + R_{poll} \times F_{4SLB} \times F_{sizecut,area,poll} \times F_{area,poll}$
Note that R_{poll} F_{major} F_{area} $F_{sizecut,major,poll}$ $F_{sizecut,area,poll}$ are all dependent upon the engine (4SRB versus 4SLB) . Values for these and the other parameters are provided below.

Parameter	Description	Value and How Determined, 4SRB	Value and How Determined, 4SLB
R_{poll}	The estimated reduction of pollutant "poll" (e.g., NO_X, VOC, CO) resulting from application of the control device needed to meet the standard	NSCR: Use same values used in rule. NO_X reduction, R_{NOX} is 97% CO reduction, R_{CO} is 49% VOC reduction, R_{VOC} is 76%	Oxidation Catalyst: Use same reductions values used in rule. CO reduction, R_{CO} is 94% VOC reduction, R_{VOC} is 71%
$F_{major,poll}$	the fraction of emissions from SI engines that attributable to major sources	As discussed in Section 3, we used Tables 3-1 to 3-3 to compute the fraction and used the same for all pollutants and all SI engine types $F_{major,NOX}$ =, $F_{major,CO}$ =, $F_{major,VOC}$= 0.27	As discussed in Section 3, we used Tables 3-1 to 3-3 to compute the fraction and used the same for all pollutants and all SI engine types $F_{major,CO}$ =,$F_{major,VOC}$= 0.27
$F_{area,poll}$	the fraction of emissions from rich burn engines attributable to area sources	1 - F_{major}	1 - F_{major}
$F_{sizecut,major,poll}$	the fraction of emissions equal or above the size cutoff for which the control device will be required for major sources	Table 3-1, Table 3-2, and Table 3-3. Cutoff is 500 HP Compute fraction of emissions for 4SRB engines at 500 and above HP to total 4SRB; major sources. $F_{sizecut,major,NOX}$ = $F_{sizecut,major,CO}$ =	Table 3-1, Table 3-2, and Table 3-3. Assume 100-500 HP. Compute fraction of emissions for 4SLB engines between 100 and 500HP to total 4SLB; major sources. $F_{sizecut,major,CO}$ = $F_{sizecut,major\ VOC}$ = 0.41
$F_{sizecut,area,poll}$	the fraction of emissions equal or above the size cutoff for which SNCR will be required for area sources	Table 3-1, Table 3-2, and Table 3-3. Assume 300 HP (final rule Aug 2010). Compute fraction of emissions for 4SRB engines at 300 and above HP to total 4SRB; area sources. $F_{sizecut,area,NOX}$ = $F_{sizecut,area,CO}$ = $F_{sizecut,area,VOC}$ =**0**.405	Table 3-1, Table 3-2, and Table 3-3.. Assume 500 HP. Compute fraction of emissions for 4SLB engines at 500 and above HP to total 4SLB; area sources. $F_{sizecut,area,CO}$ = $F_{sizecut,area,VOC}$ = 0.40
$F_{4SRB,poll}$ $F_{4SLB,poll}$	Fraction of emissions within the SCC that are rich burn and 4 stroke lean burn, respectively	Use 100% for 4SRB SCCs. For "SI, generic" SCCs, use Table 3-2, and Table 3-3. Percent of emissions of 4SRB out of all SI. $F_{4SRB,NOX}$ = .33, $F_{4SRB,CO}$ = .70 $F_{4SRB,VOC}$= .216 Note that same values apply to "oil&gas" SCCs except $F_{4SRB,VOC}$= 0 For "Boiler+engine" SCCs" : $F_{4SRB,NOX}$ = .21, $F_{4SRB,CO}$ = .38 $F_{4SRB,VOC}$= .151 For ""RICE+turbine" SCCs: $F_{4SRB,NOX}$ = .26, $F_{4SRB,CO}$ = .55	Use 100% for 4SLB SCCs. generic" SCCs, use Table 3-1, 3-2, and Table 3-3. Percent of emissions of 4SLB out of all SI. $F_{4SLB,CO}$ = .17, $F_{4SLB,VOC}$= .59 Note that same values apply to "oil&gas" SCCs except for VOC. For "Boiler+engine" SCCs" : $F_{4SLB,CO}$ = .10, $F_{4SLB,VOC}$= .41 For ""RICE+turbine" SCCs: $F_{4SLB,CO}$ = .13, $F_{4SLB,VOC}$= .52

CI Engines

Table 6-2 shows the reduction to be applied to the CI engine SCCs identified in

Table 6-1 based on the parameters computed from the baseline emissions in Table 4-1.

Table 6-2. Formula for determining the percent reduction to apply to Compression Ignition (CI) SCCs for Projection Years of 2014 and later

$$\textbf{PERCENT REDUCTION}_{CI,poll} = R_{poll} \times F_{CI,\,POLL} \times F_{nonE,sizecut,major} \times F_{major} + R_{poll} \times F_{CI,\,POLL} \times F_{nonE,sizecut,area} \times F_{area}$$

Parameter	Description	Value and How Determined, CI
R_{poll}	the estimated reduction of pollutant "poll" (e.g., NO_X, VOC, CO) resulting from application of the control device needed to meet the standard	Oxidation Catalyst: Use same values used in rule. (specific to CI) CO reduction, R_{CO} is 70% VOC reduction, R_{VOC} is 70% $PM_{2.5}$ reduction, $R_{PM2.5}$ is 30%
$F_{CI,\,POLL}$	The fraction of emissions that are CI RICE. This value is 1 except for CI engines that are in "Boiler+Engine" or "turbine+RICE" Use 2005 Platform emissions of RICE, non-RICE engines and boilers to compute fractions	**Value is 1 except for** CI engines that are characterized in "Boiler+Engine" or "turbine+RICE" **For** "Boiler+Engine" SCCs, $F_{CI,\,CO} = 0.61$ and $F_{CI,\,VOC} = 0.84$ and $F_{CI,\,PM2.5} = 0.50$ For "RICE+turbine" SCCs: $F_{CI,\,CO} = 0.83$ and $F_{CI,\,VOC} = 0.92$ and $F_{CI,\,PM2.5} = 0.78$
F_{major}	the fraction of emissions from CI engines attributable to major sources	Based on an analysis of the 2005 NEI using the "SRCTYPE" field (01 are the major, 02 are area). Since so much unknown, renormalize $F_{major,CO} = 0.42$, $F_{major,VOC} = 0.38$, $F_{major,PM2.5} = 0.44$ That fraction will be used for all pollutants.
F_{area}	the fraction of emissions from CI engines attributable to area sources	$1 - F_{major}$
$F_{nonE,sizecut,major,poll}$	The fraction of emissions from major sources from the CI SCCs that will require oxidation catalyst to meet the standard because they are non-Emergency and meet the size cutoff.	Table 4-1. The fraction of emissions of non-emergency engines from major sources equal or above 300 HP $F_{nonE,sizecut,major,CO} = 0.14$. $F_{nonE,sizecut,major,VOC} = F_{nonE,sizecut,major,PM2.5} = 0.32$
$F_{nonE,sizecut,area,poll}$	The fraction of emissions from area sources from the CI SCCs that will require oxidation catalyst to meet the standard because they are non-Emergency and meet the size cutoff.	Table 4-1. The fraction of emissions of non-emergency engines from major sources equal or above 300 HP $F_{nonE,sizecut,area,CO} = 0.40$. $F_{nonE,sizecut,area,VOC} = F_{nonE,sizecut,area,PM2.5} = 0.65$

7. Percent Reduction Calculations to be applied to NEI accounting for only the 2004 RICE rule

This section presents the formula and values to use when projecting emissions to 2012; in this situation, only the SI 4SRB engines greater than 500 HP at major sources are reduced because the compliance date for the rule that affects these engines in June 2007 which is prior to 2012. The other engines' reductions are not anticipated until the compliance dates (2013) of the most recent rules. These reductions are not impacted by the 2012 Reconsideration Amendments.

SI Engines

Table 7-1 shows the reduction to be applied to the SI engine SCCs identified in Table 2-1 based on the parameters computed from the baseline emissions in Table 3-1, Table 3-2 and

Table 3-3 and discussed in Section 3. The formula for the percent reduction is provided in the first row:

Table 7-1. Formula for determining the percent reduction to apply to SI SCCs for the 2012 projection

$PERCENT\ REDUCTION_{SI,poll} = PERCENT\ REDUCTION_{4SRB,poll}$
$PERCENT\ REDUCTION_{4SRB,poll} = R_{poll} \times F_{4SRB} \times F_{sizecut,major,poll} \times F_{major,poll}$

Parameter	Description	Value and How Determined, 4SRB
R_{poll}	The estimated reduction of pollutant "poll" (e.g., NO_X, VOC, CO) resulting from application of the control device needed to meet the standard	NSCR: Use same values used in rule. NO_X reduction, R_{NOX} is 97% CO reduction, R_{CO} is 49% VOC reduction, R_{VOC} is 76%
$F_{major,poll}$	the fraction of emissions from SI engines that attributable to major sources	Based on an analysis of the 2005 NEI using the "SRCTYPE" field (01 are the major, 02 are area) $F_{major,NOX} = 0.77$, $F_{major,CO} = 0.81$, $F_{major,VOC} = 0.75$
$F_{sizecut,major,poll}$	the fraction of emissions equal or above the size cutoff for which the control device will be required for major sources	Table 3-1, Table 3-2, and Table 3-3. Assume 300 HP (final rule Aug 2010). Compute fraction of emissions for 4SRB engines at 300 and above HP to total 4SRB; major sources. $F_{sizecut,major,NOX} = F_{sizecut,major,CO} = F_{sizecut,major,VOC} = 0.445$
$F_{sizecut,area,poll}$	the fraction of emissions equal or above the size cutoff for which SNCR will be required for area sources	Table 3-1, Table 3-2, and Table 3-3. Assume 300 HP (final rule Aug 2010). Compute fraction of emissions for 4SRB engines at 300 and above HP to total 4SRB; area sources. $F_{sizecut,area,NOX} = F_{sizecut,area,CO} = F_{sizecut,area,VOC} = \mathbf{0.405}$
$F_{4SRB,poll}$ $F_{4SLB,poll}$	Fraction of emissions within the SCC that are rich burn and 4 stroke lean burn, respectively	Use 100% for 4SRB SCCs. For "SI, generic" SCCs, use Table 3-1, Table 3-2, and Table 3-3. Percent of emissions of 4SRB out of all SI. $F_{4SRB,NOX} = .33$, $F_{4SRB,CO} = .7$ $F_{4SRB,VOC} = .37$ Note that same values apply to "oil&gas" SCCs except $F_{4SRB,VOC} = 0$ For "Boiler+engine" SCCs" : $F_{4SRB,NOX} = .21$, $F_{4SRB,CO} = .38$ $F_{4SRB,VOC} = .26$ For ""RICE+turbine" SCCs: $F_{4SRB,NOX} = .26$, $F_{4SRB,CO} = .55$ $F_{4SRB,VOC} = .34$

CI Engines

There are no reductions to apply to existing CI engines since they are impacted only by the 2010 NESHAP. There are no impacts to the 2004 rule from the 2012 Reconsideration Amendments.

8. SO_2 reductions resulting from the Ultra-low Sulfur Diesel Requirement for CI engines

This section discusses an approach to project the impact of the Ultra-low Sulfur diesel requirement for CI engines greater than 300 HP that was part of the requirements published 3/30/2010. These reductions were

not accounted for in the rule due to the expectation that engine owners/operators would make the switch anyway because ULSD is what would primarily be available. On page 9669 of **Federal Register** / Vol. 75, No. 4:

We have not quantified the SOx reductions that would occur as a result of engines switching to ULSD because we are unable to estimate the number of engines that already use ULSD and therefore we are unable to estimate the percentage of engines that may switch to ULSD due to this rule. If none of the affected engines would use ULSD without this rule, then we estimate the SOx reductions are 31,000 tpy in the year 2013. If all of the affected engine would use ULSD regardless of the rule then the additional SOx reduction would be zero.

We are aware[2]of several state rules on the books or in the proposal stage that will limit the sulfur content of home heating oil. However, some do not go into effect until after the RICE ULSD limits. Because of this timing and because we have received comments on the need to account for SO_2 reductions resulting from the RICE ULSD limits (MOG), we have chosen, in addition to applying applicable state rule fuel sulfur limits, to estimate the reduction due to RICE and apply the reduction in the future year projection. The RICE limits apply to CI greater than 300 HP.

Based on a summary of Baseline SO_2 Emissions by Engine Size for the RICE NESHAP provided by the project lead, Melanie King[3], it was determined that approximately 50% of SO_2 emissions are from engines greater than 300 HP.

We assume that CI use high sulfur fuel (3000 ppm) in the 2008 NEI and switch to ULSD by the compliance date for this RICE requirement (May 2013). In that we don't have the distribution of SO_2 emissions from the various size engines as we do other pollutants (see Table 4-1), we assumed 50% of the SO_2 comes from 300 HP and larger engines. Note that for other pollutants the fraction of emissions with size cutoff greater or equal to 300 HP ranges from 14% ($F_{nonE,sizecut,\ major,\ co}$) to 65% ($F_{nonE,sizecut,\ major,\ PM2.5}$).

Switching from 3,000 ppm sulfur content (home heating oil average) to 15 ppm would result in a 99.5% SO_2 reduction. We apply this to all diesel RICE and the portion of SO_2 emission from RICE-related SCCs that are estimated to be RICE. We computed that 12% of the SO_2 emissions from ICI (industrial, commercial and institutional) diesel boilers and internal combustion engines are from RICE. For Oil and gas production, there is only one SCC with significant SO_2 emissions: SCC=2310000220 (Industrial Processes; Oil and Gas Production: SIC 13; Drill rigs). Since we have no information to determine the amount of SO_2 from RICE versus other SO_2-emitting processes associated with drill rigs, we assume that all of the SO_2 is associated with RICE and that 50% of the emissions are associated with RICE greater than 300 HP. Therefore, the reductions we apply are the following:

- CI SCCs: 50%*99.5%=49.75%
- CI Boiler+Engine SCCs: 50%*99.5%*12%= 5.97%
- Oil and Gas, SCC=2310000220 (drill rigs): 50%*99.5%=49.75%

9. Results

A summary of the percent reductions by Engine Type and Reduction Category for the SCCs shown in Table 2-1 resulting from the implementation of the RICE rule as amended in August 2010 and again in January 2012 to include the Reconsideration Amendments is presented in Table 9-1. The SO_2 reductions reflect the RICE ULSD limits and do not account for any state ULSD requirements. We have highlighted where CO, NO_X and VOC SI engine reductions were impacted (diminished) by the inclusion of the 2012 Reconsideration Amendments.

[2] Email from Jeff Hertzog, OTAQ, USEPA Nov 22, 2010

[3] Email from Melanie King, OAQPS, USEPA, Nov 23, 2010 (filename: Existing CI RICE NESHAP Impacts 2-16-10 FINAL 3000 ppm sulfur estimate.xlsx)

Table 9-1. Summary of Percent Reductions and Emissions reduced from the 2007 Platform resulting from all 3 RICE rules, with and without Reconsideration Amendments

Engine Type	Reduction Category	% Reduction					2007 Emissions (tons)					RICE Reductions				
		CO	NO_X	$PM_{2.5}$	SO_2	VOC	CO	NO_X	$PM_{2.5}$	SO_2	VOC	CO	NO_X	$PM_{2.5}$	SO_2	VOC
CI	Boiler+Engine	12.4		7.6	6.0	30.9	9,013		2,700	66,464	1,100	1,119		204	3,968	339
CI	CI	20.4		15.1		36.7	15,690		3,289		3,875	3,194		498		1,423
CI	RICE+turbine				49.8					3,240					1,612	
oil&gas		5.9	1.4		49.8		41,497	105,778		975		2,438	1,471		485	
SI	4SLB	11.2				16.4	40,794				15,082	4,567				2,470
SI	4SRB	5.7	4.2			17.0	74,946	72,536			9,760	4,252	3,057			1,663
SI	Boiler+Engine	3.3	0.9			9.6	150,763	201,547			10,889	4,937	1,783			1,042
SI	RICE+turbine	4.6	1.1			12.2	976	998			184	45	11			22
SI	SI,generic	5.9	1.4			13.7	101,655	239,129			28,880	5,972	3,326			3,949
Grand Total (2012 Reconsideration)							**435,333**	**619,989**	**5,989**	**70,679**	**69,770**	**26,525**	**9,648**	**702**	**6,065**	**10,909**
Previous Estimate (2010 Final Rule)												**123,663**	**96,479**			**58,302**

Appendix J: SCC mapping to ICR Fuel types for Boiler MACT Reconsideration Control Packet

Fuel	ICR Category	SCC	Description
coal	Coal	10100101	External Combustion Boilers;Electric Generation;Anthracite Coal;Pulverized Coal
coal	Coal	10100102	External Combustion Boilers;Electric Generation;Anthracite Coal;Traveling Grate (Overfeed) Stoker
coal	Coal	10100201	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Pulverized Coal: Wet Bottom (Bituminous Coal)
coal	Coal	10100202	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Bituminous Coal)
coal	Coal	10100203	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Cyclone Furnace (Bituminous Coal)
coal	Coal	10100204	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Spreader Stoker (Bituminous Coal)
coal	Coal	10100205	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Traveling Grate (Overfeed) Stoker (Bituminous Coal)
coal	Coal	10100211	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Wet Bottom (Tangential) (Bituminous Coal)
coal	Coal	10100212	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Tangential) (Bituminous Coal)
coal	Coal	10100215	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Cell Burner (Bituminous Coal)
coal	Coal	10100217	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)
coal	Coal	10100218	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Circulating Bed (Bitum. Coal)
coal	Coal	10100221	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Pulverized Coal: Wet Bottom (Subbituminous Coal)
coal	Coal	10100222	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Subbituminous Coal)
coal	Coal	10100223	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Cyclone Furnace (Subbituminous Coal)
coal	Coal	10100224	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Spreader Stoker (Subbituminous Coal)
coal	Coal	10100225	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Traveling Grate (Overfeed) Stoker (Subbituminous Coal)
coal	Coal	10100226	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)
coal	Coal	10100235	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Cell Burner (Subbituminous Coal)
coal	Coal	10100237	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Bubbling Bed (Subbitum Coal)
coal	Coal	10100238	External Combustion Boilers;Electric Generation;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion - Circulating Bed (Subbitum Coal)
coal	Coal	10100300	External Combustion Boilers;Electric Generation;Lignite;Pulverized Coal: Wet Bottom
coal	Coal	10100301	External Combustion Boilers;Electric Generation;Lignite;Pulverized Coal: Dry Bottom, Wall Fired
coal	Coal	10100302	External Combustion Boilers;Electric Generation;Lignite;Pulverized Coal: Dry Bottom, Tangential Fired
coal	Coal	10100303	External Combustion Boilers;Electric Generation;Lignite;Cyclone Furnace
coal	Coal	10100304	External Combustion Boilers;Electric Generation;Lignite;Traveling Grate (Overfeed) Stoker
coal	Coal	10100306	External Combustion Boilers;Electric Generation;Lignite;Spreader Stoker
coal	Coal	10100316	External Combustion Boilers;Electric Generation;Lignite;Atmospheric Fluidized Bed ** (See 101003-17 & -18)
coal	Coal	10100317	External Combustion Boilers;Electric Generation;Lignite;Atmospheric Fluidized Bed Combustion - Bubbling Bed
coal	Coal	10100318	External Combustion Boilers;Electric Generation;Lignite;Atmospheric Fluidized Bed Combustion - Circulating Bed
Residual Oil	Heavy Liquid	10100401	External Combustion Boilers;Electric Generation;Residual Oil;Grade 6 Oil: Normal Firing
Residual Oil	Heavy Liquid	10100404	External Combustion Boilers;Electric Generation;Residual Oil;Grade 6 Oil: Tangential Firing
Residual Oil	Heavy Liquid	10100405	External Combustion Boilers;Electric Generation;Residual Oil;Grade 5 Oil: Normal Firing
Residual Oil	Heavy Liquid	10100406	External Combustion Boilers;Electric Generation;Residual Oil;Grade 5 Oil: Tangential Firing
Distillate Oil	Light Liquid	10100501	External Combustion Boilers;Electric Generation;Distillate Oil;Grades 1 and 2 Oil
Distillate Oil	Light Liquid	10100504	External Combustion Boilers;Electric Generation;Distillate Oil;Grade 4 Oil: Normal Firing

Fuel	ICR Category	SCC	Description
Distillate Oil	Light Liquid	10100505	External Combustion Boilers;Electric Generation;Distillate Oil;Grade 4 Oil: Tangential Firing
Natural Gas	Gas 1 (NG Only)	10100601	External Combustion Boilers;Electric Generation;Natural Gas;Boilers : 100 Million Btu/hr except Tangential
Natural Gas	Gas 1 (NG Only)	10100602	External Combustion Boilers;Electric Generation;Natural Gas;Boilers < 100 Million Btu/hr except Tangential
Natural Gas	Gas 1 (NG Only)	10100604	External Combustion Boilers;Electric Generation;Natural Gas;Tangentially Fired Units
Process Gas	Gas 2	10100701	External Combustion Boilers;Electric Generation;Process Gas;Boilers : 100 Million Btu/hr
Process Gas	Gas 2	10100702	External Combustion Boilers;Electric Generation;Process Gas;Boilers < 100 Million Btu/hr
Process Gas	Gas 2	10100703	External Combustion Boilers;Electric Generation;Process Gas;Petroleum Refinery Gas
Process Gas	Gas 2	10100704	External Combustion Boilers;Electric Generation;Process Gas;Blast Furnace Gas
Process Gas	Gas 2	10100707	External Combustion Boilers;Electric Generation;Process Gas;Coke Oven Gas
Process Gas	Gas 2	10100711	External Combustion Boilers;Electric Generation;Process Gas;Landfill Gas
Process Gas	Gas 2	10100712	External Combustion Boilers;Electric Generation;Process Gas;Digester Gas
Petroleum Coke	Coal	10100801	External Combustion Boilers;Electric Generation;Petroleum Coke;All Boiler Sizes
Petroleum Coke	Coal	10100818	External Combustion Boilers;Electric Generation;Petroleum Coke;Circulating Fluidized Bed Combustion
Wood/Bark Waste	Wet Biomass	10100901	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Bark-fired Boiler
Wood/Bark Waste	Wet Biomass	10100902	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Wood/Bark Fired Boiler
Wood/Bark Waste	Wet Biomass	10100903	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Wood-fired Boiler - Wet Wood (:=20% moisture)
Wood/Bark Waste	Wet Biomass	10100908	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
Wood/Bark Waste	Wet Biomass	10100910	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Fuel cell/Dutch oven boilers **
Wood/Bark Waste	Wet Biomass	10100911	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Stoker boilers **
Wood/Bark Waste	Wet Biomass	10100912	External Combustion Boilers;Electric Generation;Wood/Bark Waste;Fluidized bed combustion boilers
Liquified Petroleum Gas (LPG)	Gas 1 (Other)	10101001	External Combustion Boilers;Electric Generation;Liquified Petroleum Gas (LPG);Butane
Liquified Petroleum Gas (LPG)	Gas 1 (Other)	10101002	External Combustion Boilers;Electric Generation;Liquified Petroleum Gas (LPG);Propane
Liquified Petroleum Gas (LPG)	Gas 1 (Other)	10101003	External Combustion Boilers;Electric Generation;Liquified Petroleum Gas (LPG);Butane/Propane Mixture: Specify Percent Butane in Comments
Bagasse	Bagasse	10101101	External Combustion Boilers;Electric Generation;Bagasse;All Boiler Sizes
Solid Waste	Wet Biomass	10101201	External Combustion Boilers;Electric Generation;Solid Waste;Specify Waste Material in Comments
Solid Waste	Wet Biomass	10101202	External Combustion Boilers;Electric Generation;Solid Waste;Refuse Derived Fuel
Solid Waste	Wet Biomass	10101204	External Combustion Boilers;Electric Generation;Solid Waste;Tire Derived Fuel : Shredded
Solid Waste	Wet Biomass	10101205	External Combustion Boilers;Electric Generation;Solid Waste;Sludge Waste
Solid Waste	Wet Biomass	10101206	External Combustion Boilers;Electric Generation;Solid Waste;Agricultural Byproducts (rice or peanut hulls, shells, cow manure, etc
Solid Waste	Wet Biomass	10101207	External Combustion Boilers;Electric Generation;Solid Waste;Other Biomass Solids
Solid Waste	Wet Biomass	10101208	External Combustion Boilers;Electric Generation;Solid Waste;Paper Pellets
Liquid Waste	Heavy Liquid	10101301	External Combustion Boilers;Electric Generation;Liquid Waste;Specify Waste Material in Comments
Liquid Waste	Heavy Liquid	10101302	External Combustion Boilers;Electric Generation;Liquid Waste;Waste Oil
Liquid Waste	Heavy Liquid	10101304	External Combustion Boilers;Electric Generation;Liquid Waste;Black Liquor
Liquid Waste	Heavy Liquid	10101305	External Combustion Boilers;Electric Generation;Liquid Waste;Red Liquor
Liquid Waste	Heavy Liquid	10101306	External Combustion Boilers;Electric Generation;Liquid Waste;Spent Sulfite Liquor
Liquid Waste	Heavy Liquid	10101307	External Combustion Boilers;Electric Generation;Liquid Waste;Tall Oil
Liquid Waste	Heavy Liquid	10101308	External Combustion Boilers;Electric Generation;Liquid Waste;Wood/Wood Waste Liquid
Methanol	Heavy Liquid	10101601	External Combustion Boilers;Electric Generation;Methanol;All
Hydrogen	Gas 1 (Other)	10101801	External Combustion Boilers;Electric Generation;Hydrogen;All
Coal-based Synfuel	Heavy Liquid	10101901	External Combustion Boilers;Electric Generation;Coal-based Synfuel;All

Fuel	ICR Category	SCC	Description
Waste Coal	Coal	10102001	External Combustion Boilers;Electric Generation;Waste Coal;All
Waste Coal	Coal	10102018	External Combustion Boilers;Electric Generation;Waste Coal;Circulating Fluidized Bed Combustion
Other Oil	Light Liquid	10102101	External Combustion Boilers;Electric Generation;Other Oil;All
coal	Coal	10200101	External Combustion Boilers;Industrial;Anthracite Coal;Pulverized Coal
coal	Coal	10200104	External Combustion Boilers;Industrial;Anthracite Coal;Traveling Grate (Overfeed) Stoker
coal	Coal	10200107	External Combustion Boilers;Industrial;Anthracite Coal;Hand-fired
coal	Coal	10200117	External Combustion Boilers;Industrial;Anthracite Coal;Fluidized Bed Boiler Burning Anthracite-Culm Fuel
coal	Coal	10200201	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Pulverized Coal: Wet Bottom
coal	Coal	10200202	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom
coal	Coal	10200203	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Cyclone Furnace
coal	Coal	10200204	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Spreader Stoker
coal	Coal	10200205	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Overfeed Stoker
coal	Coal	10200206	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Underfeed Stoker
coal	Coal	10200210	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Overfeed Stoker **
coal	Coal	10200212	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Tangential)
coal	Coal	10200213	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Wet Slurry
coal	Coal	10200217	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)
coal	Coal	10200218	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Circulating Bed (Bitum. Coal)
coal	Coal	10200219	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Cogeneration (Bituminous Coal)
coal	Coal	10200221	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Pulverized Coal: Wet Bottom (Subbituminous Coal)
coal	Coal	10200222	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Subbituminous Coal)
coal	Coal	10200223	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Cyclone Furnace (Subbituminous Coal)
coal	Coal	10200224	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Spreader Stoker (Subbituminous Coal)
coal	Coal	10200225	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Traveling Grate (Overfeed) Stoker (Subbituminous Coal)
coal	Coal	10200226	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)
coal	Coal	10200229	External Combustion Boilers;Industrial;Bituminous/Subbituminous Coal;Cogeneration (Subbituminous Coal)
coal	Coal	10200300	External Combustion Boilers;Industrial;Lignite;Pulverized Coal: Wet Bottom
coal	Coal	10200301	External Combustion Boilers;Industrial;Lignite;Pulverized Coal: Dry Bottom, Wall Fired
coal	Coal	10200302	External Combustion Boilers;Industrial;Lignite;Pulverized Coal: Dry Bottom, Tangential Fired
coal	Coal	10200303	External Combustion Boilers;Industrial;Lignite;Cyclone Furnace
coal	Coal	10200304	External Combustion Boilers;Industrial;Lignite;Traveling Grate (Overfeed) Stoker
coal	Coal	10200306	External Combustion Boilers;Industrial;Lignite;Spreader Stoker
coal	Coal	10200307	External Combustion Boilers;Industrial;Lignite;Cogeneration
Residual Oil	Heavy Liquid	10200401	External Combustion Boilers;Industrial;Residual Oil;Grade 6 Oil
Residual Oil	Heavy Liquid	10200402	External Combustion Boilers;Industrial;Residual Oil;10-100 Million Btu/hr **
Residual Oil	Heavy Liquid	10200403	External Combustion Boilers;Industrial;Residual Oil;< 10 Million Btu/hr **
Residual Oil	Heavy Liquid	10200404	External Combustion Boilers;Industrial;Residual Oil;Grade 5 Oil
Residual Oil	Heavy Liquid	10200405	External Combustion Boilers;Industrial;Residual Oil;Cogeneration
Distillate Oil	Light Liquid	10200501	External Combustion Boilers;Industrial;Distillate Oil;Grades 1 and 2 Oil
Distillate Oil	Light Liquid	10200502	External Combustion Boilers;Industrial;Distillate Oil;10-100 Million Btu/hr **
Distillate Oil	Light Liquid	10200503	External Combustion Boilers;Industrial;Distillate Oil;< 10 Million Btu/hr **

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Distillate Oil	Light Liquid	10200504	External Combustion Boilers;Industrial;Distillate Oil;Grade 4 Oil
Distillate Oil	Light Liquid	10200505	External Combustion Boilers;Industrial;Distillate Oil;Cogeneration
Natural Gas	Gas 1 (NG Only)	10200601	External Combustion Boilers;Industrial;Natural Gas;> 100 Million Btu/hr
Natural Gas	Gas 1 (NG Only)	10200602	External Combustion Boilers;Industrial;Natural Gas;10-100 Million Btu/hr
Natural Gas	Gas 1 (NG Only)	10200603	External Combustion Boilers;Industrial;Natural Gas;< 10 Million Btu/hr
Natural Gas	Gas 1 (NG Only)	10200604	External Combustion Boilers;Industrial;Natural Gas;Cogeneration
Process Gas	Gas 2	10200701	External Combustion Boilers;Industrial;Process Gas;Petroleum Refinery Gas
Process Gas	Gas 2	10200704	External Combustion Boilers;Industrial;Process Gas;Blast Furnace Gas
Process Gas	Gas 2	10200707	External Combustion Boilers;Industrial;Process Gas;Coke Oven Gas
Process Gas	Gas 2	10200710	External Combustion Boilers;Industrial;Process Gas;Cogeneration
Process Gas	Gas 2	10200711	External Combustion Boilers;Industrial;Process Gas;Landfill Gas
Process Gas	Gas 2	10200799	External Combustion Boilers;Industrial;Process Gas;Other: Specify in Comments
Petroleum Coke	Coal	10200802	External Combustion Boilers;Industrial;Petroleum Coke;All Boiler Sizes
Petroleum Coke	Coal	10200804	External Combustion Boilers;Industrial;Petroleum Coke;Cogeneration
Wood/Bark Waste	Wet Biomass	10200901	External Combustion Boilers;Industrial;Wood/Bark Waste;Bark-fired Boiler
Wood/Bark Waste	Wet Biomass	10200902	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood/Bark-fired Boiler
Wood/Bark Waste	Wet Biomass	10200903	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Wet Wood (:=20% moisture)
Wood/Bark Waste	Wet Biomass	10200904	External Combustion Boilers;Industrial;Wood/Bark Waste;Bark-fired Boiler (< 50,000 Lb Steam) **
Wood/Bark Waste	Wet Biomass	10200905	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood/Bark-fired Boiler (< 50,000 Lb Steam) **
Wood/Bark Waste	Wet Biomass	10200906	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler (< 50,000 Lb Steam) **
Wood/Bark Waste	Wet Biomass	10200907	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood Cogeneration
Wood/Bark Waste	Wet Biomass	10200908	External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
Wood/Bark Waste	Wet Biomass	10200910	External Combustion Boilers;Industrial;Wood/Bark Waste;Fuel cell/Dutch oven boilers **
Wood/Bark Waste	Wet Biomass	10200911	External Combustion Boilers;Industrial;Wood/Bark Waste;Stoker boilers **
Wood/Bark Waste	Wet Biomass	10200912	External Combustion Boilers;Industrial;Wood/Bark Waste;Fluidized bed combustion boiler
LPG	Gas 1 (Other)	10201001	External Combustion Boilers;Industrial;Liquified Petroleum Gas (LPG);Butane
LPG	Gas 1 (Other)	10201002	External Combustion Boilers;Industrial;Liquified Petroleum Gas (LPG);Propane
LPG	Gas 1 (Other)	10201003	External Combustion Boilers;Industrial;Liquified Petroleum Gas (LPG);Butane/Propane Mixture: Specify Percent Butane in Comments
Bagasse	Bagasse	10201101	External Combustion Boilers;Industrial;Bagasse;All Boiler Sizes
Solid Waste	Wet Biomass	10201201	External Combustion Boilers;Industrial;Solid Waste;Specify Waste Material in Comments
Solid Waste	Wet Biomass	10201202	External Combustion Boilers;Industrial;Solid Waste;Refuse Derived Fuel
Liquid Waste	Heavy Liquid	10201301	External Combustion Boilers;Industrial;Liquid Waste;Specify Waste Material in Comments
Liquid Waste	Heavy Liquid	10201302	External Combustion Boilers;Industrial;Liquid Waste;Waste Oil
Liquid Waste	Heavy Liquid	10201303	External Combustion Boilers;Industrial;Liquid Waste;Salable Animal Fat
Methanol	Heavy Liquid	10201601	External Combustion Boilers;Industrial;Methanol;Industrial Boiler
Gasoline	Light Liquid	10201701	External Combustion Boilers;Industrial;Gasoline;Industrial Boiler
coal	Coal	10300101	External Combustion Boilers;Commercial/Institutional;Anthracite Coal;Pulverized Coal
coal	Coal	10300102	External Combustion Boilers;Commercial/Institutional;Anthracite Coal;Traveling Grate (Overfeed) Stoker
coal	Coal	10300103	External Combustion Boilers;Commercial/Institutional;Anthracite Coal;Hand-fired
coal	Coal	10300203	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Cyclone Furnace (Bituminous Coal)
coal	Coal	10300205	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Pulverized Coal: Wet Bottom (Bituminous Coal)

Fuel	ICR Category	SCC	Description
coal	Coal	10300206	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Bituminous Coal)
coal	Coal	10300207	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Overfeed Stoker (Bituminous Coal)
coal	Coal	10300208	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Underfeed Stoker (Bituminous Coal)
coal	Coal	10300209	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Spreader Stoker (Bituminous Coal)
coal	Coal	10300211	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Overfeed Stoker **
coal	Coal	10300214	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Hand-fired (Bituminous Coal)
coal	Coal	10300216	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Tangential) (Bituminous Coal)
coal	Coal	10300217	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)
coal	Coal	10300218	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Atmospheric Fluidized Bed Combustion: Circulating Bed (Bitum. Coal)
coal	Coal	10300221	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Pulverized Coal: Wet Bottom (Subbituminous Coal)
coal	Coal	10300222	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom (Subbituminous Coal)
coal	Coal	10300223	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Cyclone Furnace (Subbituminous Coal)
coal	Coal	10300224	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Spreader Stoker (Subbituminous Coal)
coal	Coal	10300225	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Traveling Grate (Overfeed) Stoker (Subbituminous Coal)
coal	Coal	10300226	External Combustion Boilers;Commercial/Institutional;Bituminous/Subbituminous Coal;Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)
coal	Coal	10300300	External Combustion Boilers;Commercial/Institutional;Lignite;Pulverized Coal: Wet Bottom
coal	Coal	10300305	External Combustion Boilers;Commercial/Institutional;Lignite;Pulverized Coal: Dry Bottom, Wall Fired
coal	Coal	10300306	External Combustion Boilers;Commercial/Institutional;Lignite;Pulverized Coal: Dry Bottom, Tangential Fired
coal	Coal	10300307	External Combustion Boilers;Commercial/Institutional;Lignite;Traveling Grate (Overfeed) Stoker
coal	Coal	10300309	External Combustion Boilers;Commercial/Institutional;Lignite;Spreader Stoker
Residual Oil	Heavy Liquid	10300401	External Combustion Boilers;Commercial/Institutional;Residual Oil;Grade 6 Oil
Residual Oil	Heavy Liquid	10300402	External Combustion Boilers;Commercial/Institutional;Residual Oil;10-100 Million Btu/hr **
Residual Oil	Heavy Liquid	10300403	External Combustion Boilers;Commercial/Institutional;Residual Oil;< 10 Million Btu/hr **
Residual Oil	Heavy Liquid	10300404	External Combustion Boilers;Commercial/Institutional;Residual Oil;Grade 5 Oil
Distillate Oil	Light Liquid	10300501	External Combustion Boilers;Commercial/Institutional;Distillate Oil;Grades 1 and 2 Oil
Distillate Oil	Light Liquid	10300502	External Combustion Boilers;Commercial/Institutional;Distillate Oil;10-100 Million Btu/hr **
Distillate Oil	Light Liquid	10300503	External Combustion Boilers;Commercial/Institutional;Distillate Oil;< 10 Million Btu/hr **
Distillate Oil	Light Liquid	10300504	External Combustion Boilers;Commercial/Institutional;Distillate Oil;Grade 4 Oil
Natural Gas	Gas 1 (NG Only)	10300601	External Combustion Boilers;Commercial/Institutional;Natural Gas;> 100 Million Btu/hr
Natural Gas	Gas 1 (NG Only)	10300602	External Combustion Boilers;Commercial/Institutional;Natural Gas;10-100 Million Btu/hr
Natural Gas	Gas 1 (NG Only)	10300603	External Combustion Boilers;Commercial/Institutional;Natural Gas;< 10 Million Btu/hr
Process Gas	Gas 2	10300701	External Combustion Boilers;Commercial/Institutional;Process Gas;POTW Digester Gas-fired Boiler
Process Gas	Gas 2	10300799	External Combustion Boilers;Commercial/Institutional;Process Gas;Other Not Classified
Landfill Gas	Gas 2	10300811	External Combustion Boilers;Commercial/Institutional;Landfill Gas;Landfill Gas
Wood/Bark Waste	Wet Biomass	10300901	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Bark-fired Boiler
Wood/Bark Waste	Wet Biomass	10300902	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood/Bark-fired Boiler
Wood/Bark Waste	Wet Biomass	10300903	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Wet Wood (:=20% moisture)
Wood/Bark Waste	Wet Biomass	10300908	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture)
Wood/Bark Waste	Wet Biomass	10300910	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Fuel cell/Dutch oven boilers **

Fuel	ICR Category	SCC	Description
Wood/Bark Waste	Wet Biomass	10300911	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Stoker boilers **
Wood/Bark Waste	Wet Biomass	10300912	External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Fluidized bed combustion boilers
LPG	Gas 1 (Other)	10301001	External Combustion Boilers;Commercial/Institutional;Liquified Petroleum Gas (LPG);Butane
LPG	Gas 1 (Other)	10301002	External Combustion Boilers;Commercial/Institutional;Liquified Petroleum Gas (LPG);Propane
LPG	Gas 1 (Other)	10301003	External Combustion Boilers;Commercial/Institutional;Liquified Petroleum Gas (LPG);Butane/Propane Mixture: Specify Percent Butane in Comments
Solid Waste	Wet Biomass	10301201	External Combustion Boilers;Commercial/Institutional;Solid Waste;Specify Waste Material in Comments
Solid Waste	Wet Biomass	10301202	External Combustion Boilers;Commercial/Institutional;Solid Waste;Refuse Derived Fuel
Liquid Waste	Heavy Liquid	10301301	External Combustion Boilers;Commercial/Institutional;Liquid Waste;Specify Waste Material in Comments
Liquid Waste	Heavy Liquid	10301302	External Combustion Boilers;Commercial/Institutional;Liquid Waste;Waste Oil
Liquid Waste	Heavy Liquid	10301303	External Combustion Boilers;Commercial/Institutional;Liquid Waste;Sewage Grease Skimmings
coal	Coal	10500102	External Combustion Boilers;Space Heaters;Industrial;Coal **
Distillate Oil	Light Liquid	10500105	External Combustion Boilers;Space Heaters;Industrial;Distillate Oil
Natural Gas	Gas 1 (NG Only)	10500106	External Combustion Boilers;Space Heaters;Industrial;Natural Gas
LPG	Gas 1 (Other)	10500110	External Combustion Boilers;Space Heaters;Industrial;Liquified Petroleum Gas (LPG)
Waste oil	Heavy Liquid	10500113	External Combustion Boilers;Space Heaters;Industrial;Waste Oil: Air Atomized Burner
Waste oil	Heavy Liquid	10500114	External Combustion Boilers;Space Heaters;Industrial;Waste Oil: Vaporizing Burner
coal	Coal	10500202	External Combustion Boilers;Space Heaters;Commercial/Institutional;Coal **
Distillate Oil	Light Liquid	10500205	External Combustion Boilers;Space Heaters;Commercial/Institutional;Distillate Oil
Natural Gas	Gas 1 (NG Only)	10500206	External Combustion Boilers;Space Heaters;Commercial/Institutional;Natural Gas
Wood	Dry Biomass	10500209	External Combustion Boilers;Space Heaters;Commercial/Institutional;Wood
LPG	Gas 1 (Other)	10500210	External Combustion Boilers;Space Heaters;Commercial/Institutional;Liquified Petroleum Gas (LPG)
Waste oil	Heavy Liquid	10500213	External Combustion Boilers;Space Heaters;Commercial/Institutional;Waste Oil: Air Atomized Burner
Waste oil	Heavy Liquid	10500214	External Combustion Boilers;Space Heaters;Commercial/Institutional;Waste Oil: Vaporizing Burner
Distillate Oil	Light Liquid	30190001	Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30190002	Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30190003	Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Natural Gas: Process Heaters
Process Gas	Gas 2	30190004	Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Process Gas: Process Heaters
Distillate Oil	Light Liquid	30290001	Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30290002	Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30290003	Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Natural Gas: Process Heaters
LPG	Gas 1 (Other)	30290005	Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Liquified Petroleum Gas (LPG): Process Heaters
Distillate Oil	Light Liquid	30390001	Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30390002	Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30390003	Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Natural Gas: Process Heaters
Process Gas	Gas 2	30390004	Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Process Gas: Process Heaters
Distillate Oil	Light Liquid	30490001	Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30490002	Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30490003	Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Natural Gas: Process Heaters
Process Gas	Gas 2	30490004	Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Process Gas: Process Heaters
Distillate Oil	Light Liquid	30590001	Industrial Processes;Mineral Products;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30590002	Industrial Processes;Mineral Products;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30590003	Industrial Processes;Mineral Products;Fuel Fired Equipment;Natural Gas: Process Heaters

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LPG	Gas 1 (Other)	30590005	Industrial Processes;Mineral Products;Fuel Fired Equipment;Liquified Petroleum Gas (LPG): Process Heaters
oil	Light Liquid	30600101	Industrial Processes;Petroleum Industry;Process Heaters;Oil-fired **
gas	Gas 2	30600102	Industrial Processes;Petroleum Industry;Process Heaters;Gas-fired **
oil	Light Liquid	30600103	Industrial Processes;Petroleum Industry;Process Heaters;Oil-fired
gas	Gas 2	30600104	Industrial Processes;Petroleum Industry;Process Heaters;Gas-fired
natural gas	Gas 1 (NG Only)	30600105	Industrial Processes;Petroleum Industry;Process Heaters;Natural Gas-fired
Process Gas	Gas 2	30600106	Industrial Processes;Petroleum Industry;Process Heaters;Process Gas-fired
LPG	Gas 1 (Other)	30600107	Industrial Processes;Petroleum Industry;Process Heaters;LPG-fired
Landfill Gas	Gas 2	30600108	Industrial Processes;Petroleum Industry;Process Heaters;Landfill Gas-fired
oil	Light Liquid	30600111	Industrial Processes;Petroleum Industry;Process Heaters;Oil-fired (No. 6 Oil) : 100 Million Btu Capacity
unknown	Gas 1 (NG Only)	30600199	Industrial Processes;Petroleum Industry;Process Heaters;Other Not Classified
Distillate Oil	Light Liquid	30790001	Industrial Processes;Pulp and Paper and Wood Products;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30790002	Industrial Processes;Pulp and Paper and Wood Products;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30790003	Industrial Processes;Pulp and Paper and Wood Products;Fuel Fired Equipment;Natural Gas: Process Heaters
Distillate Oil	Light Liquid	30890001	Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30890002	Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	30890003	Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Natural Gas: Process Heaters
LPG	Gas 1 (Other)	30890004	Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Liquified Petroleum Gas (LPG): Process Heaters
Distillate Oil	Light Liquid	30990001	Industrial Processes;Fabricated Metal Products;Fuel Fired Equipment;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	30990002	Industrial Processes;Fabricated Metal Products;Fuel Fired Equipment;Residual Oil: Process Heaters
Natural Gas	Gas 1 (NG Only)	30990003	Industrial Processes;Fabricated Metal Products;Fuel Fired Equipment;Natural Gas: Process Heaters
Distillate Oil	Light Liquid	31000401	Industrial Processes;Oil and Gas Production;Process Heaters;Distillate Oil (No. 2)
Residual Oil	Heavy Liquid	31000402	Industrial Processes;Oil and Gas Production;Process Heaters;Residual Oil
crude oil	Heavy Liquid	31000403	Industrial Processes;Oil and Gas Production;Process Heaters;Crude Oil
Natural Gas	Gas 1 (NG Only)	31000404	Industrial Processes;Oil and Gas Production;Process Heaters;Natural Gas
Process Gas	Gas 2	31000405	Industrial Processes;Oil and Gas Production;Process Heaters;Process Gas
propane/butane	Gas 1 (Other)	31000406	Industrial Processes;Oil and Gas Production;Process Heaters;Propane/Butane
Distillate Oil	Light Liquid	31000411	Industrial Processes;Oil and Gas Production;Process Heaters;Distillate Oil (No. 2): Steam Generators
Residual Oil	Heavy Liquid	31000412	Industrial Processes;Oil and Gas Production;Process Heaters;Residual Oil: Steam Generators
crude oil	Heavy Liquid	31000413	Industrial Processes;Oil and Gas Production;Process Heaters;Crude Oil: Steam Generators
Natural Gas	Gas 1 (NG Only)	31000414	Industrial Processes;Oil and Gas Production;Process Heaters;Natural Gas: Steam Generators
Process Gas	Gas 2	31000415	Industrial Processes;Oil and Gas Production;Process Heaters;Process Gas: Steam Generators
Distillate Oil	Light Liquid	31390001	Industrial Processes;Electrical Equipment;Process Heaters;Distillate Oil (No. 2)
Residual Oil	Heavy Liquid	31390002	Industrial Processes;Electrical Equipment;Process Heaters;Residual Oil
Natural Gas	Gas 1 (NG Only)	31390003	Industrial Processes;Electrical Equipment;Process Heaters;Natural Gas
Distillate Oil	Light Liquid	39900501	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Distillate Oil
Natural Gas	Gas 1 (NG Only)	39900601	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Natural Gas
Process Gas	Gas 2	39900701	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Process Gas
Refinery Gas	Gas 1 (Other)	39900711	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Refinery Gas
Digester Gas	Gas 2	39900721	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Digester Gas
Landfill Gas	Gas 2	39900801	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Landfill Gas
LPG	Gas 1 (Other)	39901001	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;LPG

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Methanol	Heavy Liquid	39901601	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Methanol
Gasoline	Light Liquid	39901701	Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Gasoline
Distillate Oil	Light Liquid	39990001	Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Distillate Oil (No. 2): Process Heaters
Residual Oil	Heavy Liquid	39990002	Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Residual Oil: Process Heaters
natural gas	Gas 1 (NG Only)	39990003	Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Natural Gas: Process Heaters
Process Gas	Gas 2	39990004	Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Process Gas: Process Heaters