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MEMORANDUM

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SUBJECT: Control Measures Changes to AirControlNET 4.1 As Part of Control Measures Validation Review

This memorandum provides a detailed listing of the changes to AirControlNET 4.1 resulting from a review of the control measures data that occurred between February 1, 2006 and April 1, 2006. These revisions occurred as a result of extensive review of the AirControlNET's PM_{2.5}, PM₁₀, SO₂, and NO_x control measures by control measure experts in OAQPS, OPAR, and other offices in EPA. All of these revisions were included in AirControlNET 4.1 as of April 11, 2006 for use in the final PM_{2.5} NAAQS RIA control strategy analyses, and the control measures documentation report for that version of AirControlNET reflects all of these changes.

Revisions to Control Measures Already in AirControlNET 4.1

Correct the commercial cooking control measure - catalytic oxidizer - to only 10% of the emissions in Source Classification Code (SCC) 2302002000. To make this adjustment, change the rule penetration to 10% from 100%. No other data for this measure shall be changed.

Correct the residential wood stove control measure - changeout to an NSPS-compliant wood stove - to have a rule penetration of 10% from the current 100%. No other data for this measure shall be changed.

Add organic carbon (OC) and elemental carbon (EC) control efficiencies to the IMF (increased monitoring frequency) and continuous emission monitoring (CEM)s upgrade control measures. These control efficiencies will be identical to the PM₁₀ and PM_{2.5} efficiencies currently there (6.5% and 7.7%), respectively. It will also be made clear that these controls can only be applied to sources that already have an electrostatic precipitator (ESP) or baghouse (fabric filter) installed. No other data for this measure will change.

- 1) P. III-1229 – Remove the following from the list of affected SCCs for the Wood Pulp and Paper source category/Dry ESP-Wire Plate Type control measure combination:

30700101
30700102
30700105
30700118
30700121
30700122
30700199

- 2) P. III-1232 – Remove the following from the list of affected SCCs for the Wood Pulp and Paper source category/Wet ESP-Wire Plate Type control measure combination:

30700101
30700102
30700105
30700118
30700121
30700122
30700199

- 3) P. III-1278 – Remove SCC 30700106 from the list of affected SCCs for the Pulp and Paper Industry (Sulfate Pulping) source category /Flue Gas Desulfurization control measure combination.

- 4) P. III-1128 – Remove SCCs 30300515, 30300516, and 30300519 from the list of affected SCCs for the Non-Ferrous Metal Processing – Copper source category/Fabric Filter control measure combination and the combination of this source category with ESPs (all types).

- 5) For all Asphalt Manufacture source category/Fabric Filter (any type) control measure combinations, remove the following SCCs from the affected list: 30500101, 30500102, 30500103, 30500105, 30500106, 30500108, 30500110, 30500111, 30500117, 30500290. The first of these combinations is on p. III-635.

- 6) Remove the Lime Kilns source category/SNCR (Selective Non-Catalytic Reduction) and Lime Kilns/SCR (Selective Catalytic Reduction) control measure combinations. AirControlNET 4.1 shall not have any post-combustion control on NOx from this source category. The first of these combinations is on p. III-377.

- 7) Mineral Products – coal cleaning

Delete all add-on controls (all Fabric filters, ESPs, venturi scrubber) for

30501008
30501009
30501011
30501015
30501016
30501021
30501022
30501023
30501024
30501030
30501031
30501032
30501033
30501036
30501037
30501038
30501039
30501040
30501041
30501043
30501044
30501045
30501046
30501047
30501049
30501050
30501051
30501090
30501099

8) Fabricated metal products – welding

Donna Lee Jones of OAQPS/SPPD recommends following control options for fabricated metal products – welding SCCs 30900501 and 30904001.

- * FF- cartridge type 25% control
- * total enclosure and FF-cartridge type 99%
- * hood and FF –cart 98%
- * fume gun 75%
- * pulse current 50%

Please include these measures and flag them in AirControlNET due to their being no cost data for them.

9) Mineral Products – Stone Quarrying & Processing

Please remove the applicability of dry ESPs and baghouses to the following SCCs (p. III-1080, 1084, 1088, 1092, 1096, 1100, and III-1104):

30502008
30502009
30502010
30502011
30502017
30502020

With this change in applicability, the IMF and CEM upgrade/IMF applicability to these SCCs shall also be removed.

10) Mineral Products Industry (p. III-1264)

Please remove the applicability of FGD (flue gas desulfurization) scrubbers to the following SCCs:

30500612
30599999

11) Mineral Products – Cement Manufacture

Please remove the applicability of fabric filters (any type) to the following SCCs:

30500607
30500608
30500615
30500619
30500699
30500707
30500708
30500719
30500799

For dry ESP – Wire Plate Type applied to Mineral Products – Cement Manufacture, please remove the applicability to these SCCs:

30500607
30500608
30500609
30500610

30500611
30500612
30500613
30500615
30500616
30500617
30500618
30500619
30500624
30500699
30500707
30500708
30500709
30500710
30500712
30500714
30500716
30500717
30500718
30500719
30500719
30500799

12) For Mineral Products – Cement Manufacture, Paper/Nonwoven Filters (p. III-987)
please remove the applicability to these SCCs:

30500608
30500615
30500619
30500699
30500708
30500799

13) For Mineral Products – Cement Manufacture, Paper/Nonwoven Filters (p. III-987)
please remove the applicability to these SCCs:

30500608
30500615
30500619
30500699
30500708
30500719
30500799

14) For Fabric Filter – any type at Ferrous Metals Processing – Coke, please remove the applicability to these SCCs:

30300302
30300304
30300308
30300334
30300401

15) For Venturi Scrubber applied to Ferrous Metal Processing – Coke, please remove the applicability to these SCCs:

30300302
30300304
30300308

16) For Vacuum Carbonate + Sulfur Recovery Plant applied to By-Product Coke Manufacturing (p. III-1248), please make this control measure applicable only to SCC 30300306. Also, change the control efficiency to 90% from 82%.

17) For FGD scrubbers applied in the Petroleum Industry (p. III-1267), please remove the applicability to these SCCs;

30600101
30600103
30600104
30600105
30600106
30600202
30600301
30600401
30600504
30600805
30600903
30600904
30600999
30601001
30601401
30609903
30609904

18) Remove FGD scrubber's applicability to Sulfur Recovery Plants – Elemental Sulfur (p. III-1302) and Sulfur Recovery Plants – Sulfur Removal (p. III-1304) from the control measures database.

19) Remove the IMF of PM Controls as well as the CEM Upgrade and IMF of PM Controls measure's applicability to the following source categories:

Commercial Institutional Boilers – Liquid Waste

Industrial Boilers – Liquid Waste

Commercial Institutional Boilers – LPG

Industrial Boilers - LPG

Commercial Institutional Boilers – Natural Gas

Industrial Boilers – Natural Gas

Commercial Institutional Boilers – Process Gas

Industrial Boilers – Process Gas

For Commercial Institutional Boilers – Oil , remove the applicability of Dry ESP – Wire Plate Type to SCC 10300501

For Commercial Institutional Boilers – Oil, remove the applicability of IMF of PM Controls and CEM Upgrade and IMF of PM Controls to SCC 103005

For Fabric Filter (Pulse Jet Type) applied to Commercial Institutional Boilers – Wood/Bark, change the control efficiency to 80%. This change is based on AP-42 emission factors for these sources.

For Dry ESP – Wire Plate Type applied to Commercial Institutional Boilers – Wood/Bark, change the control efficiency for both PM_{10} and $PM_{2.5}$ to 90%. This change is based on AP-42 emission factors for these sources.

For Commercial Institutional Boilers – Wood/Bark, change the control efficiency of fabric filters (any type) to 80% for both PM_{10} and $PM_{2.5}$. This change is based on AP-42 emission factors for these sources.

For Industrial Boilers – Oil, remove the applicability of IMF of PM Controls and CEM Upgrade and IMF of PM Controls to SCC 102005.

20) For FGD (both dry and wet) scrubbers applied to Bituminous/Subbituminous Coal, remove the applicability to SCC 10300217. Also, make the same change for Spray Dryer Absorber' and applicability to the same source category.

21) For Distillate Oil (Industrial Boilers), remove the applicability of Wet FGD scrubbers entirely to this source category.

Control Measures Added to AirControlNET 4.1

Area Source SO₂ Control Measure.

This measure will be a switch from high-sulfur (2,500 ppm sulfur content) to low-sulfur (500 ppm) home heating oil for residential users. Resulting control efficiencies are as follows:

75% - SO₂

80% - PM10 and PM2.5

10% - NO_x

Note: there are no OC and EC control efficiencies with this measure.

The resulting costs are 1.5 cents/gallon. Presuming a density of 0.8 for home heating oil (HHO), 1 gallon = $0.8 \times 8 = 6.4$ lbs of oil. The costs in dollars per ton annually is thus $(2000/6.4) \times 0.015 = \$4.70/\text{ton of HHO} \times (1 \text{ ton of oil}/0.02 \text{ percent of sulfur/ton of oil}) = 4.70 \times 500 = \$2,350/\text{ton sulfur in HHO}$. Given that reduction of 1 part sulfur in HHO is equal to 1 part SO₂ emissions, then we can say that the cost per ton of SO₂ reduction due to this switch to home heating oil is also \$2,350. Note: the study from which this data is taken states there is a 1:1 relationship between fuel sulfur content reduction and SO₂ emissions reduction.

The cost for this measure in AirControlNET shall be \$2,350/ton of SO₂ emissions reduction (2002\$).

In addition, there is some evidence of reductions in maintenance costs for residential users due to reduced fouling of heating equipment and reduced cleaning. The costs have not been adjusted for these reductions. Please note this in the new at-a-glance table for this measure.

The SCC this control measure applies to: 2104004000 (Stationary Source Fuel **Combustion – Residential** - Distillate Oil).

Source: Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs, and Implementation Issues. NESCAUM, Boston, MA. December 2005.

Area and Point Non-EGU PM Control Measures

ESP for Commercial Cooking or "Smog-Hog". Applied to Underfired Charbroilers. This control is to be applied to all commercial cooking category SCCs, but with a rule

penetration of only 18.75% (equal to 75% of all commercial cooking emissions with application to 25% of this amount of emissions).

The capital cost of this control: \$38,500 (range of capital costs from \$2,000 - 75,000).

Annualized capital costs: \$5,482. Equipment life of the control is 10 years, and costs are annualized at 7%.

O&M costs: \$500.

Total annualized costs: \$5,982.

Control efficiency: 99% of PM_{2.5} and PM₁₀. OC and EC reductions are presumed to be identical to the PM reductions.

Plant-Specific PM_{2.5} Control Measure Applications

Below in Table 1 is a list of control measures that exist on PM_{2.5} point sources likely to be impacted control strategies associated with direct PM reductions in areas that our air quality modeling has shown to be nonattainment.

Table 1. New PM_{2.5} Control Measures – for Various Iron and Steel Mill Emissions Points

Source Category	SCCs to be controlled	PM _{2.5} Control measure/percent control	Plants to apply control measure to within SCCs	Costs (1999\$)
Blast Furnace Casthouse	30300825	Install capture hoods vented to a baghouse (85% reduction, range of control efficiencies is 80 -90%)	AK Steel, Butler co., Ohio (Plant ID: 1409010006)	This control already installed April 2005, thus no additional control
	“		AK Steel, Ashland, KY (Plant ID: 2101900005)	Capital: \$5.32 million; Annualized: \$1.2 million*
	“		LTV (now Mittal), Cleveland, OH	“
	“		LTV (now Mittal), East Chicago, IN	“
	“	For this plant, apply control to 25% of	U.S. Steel, Gary, IN (Plant ID: 00121)	“

		emissions		
	30300824		Weirton Steel, Hancock Co., WV (Plant ID: 00001)	“
	30300825		Rouge Steel (now Severstal), Wayne Co., MI (Plant ID: A8640)	None (control already planned)
	30300825		Bethlehem (now Mittai) Steel, Porter Co., IN (Plant ID: 00001)	None (expected control due to MACT standard)
	30300825	For Republic Technologies, Lorain, OH apply control to 50% of emissions	Republic Technologies, Lorain, OH	“
Blast Open Furnace (BOF)-open hoods	30300913	Dedicated secondary capture and control system (use 85% as best estimate of control efficiency, range from 80-90%)	AK Steel, Butler co., Ohio (Plant ID: 1409010006)	None (Control already installed)
	“		Rouge Steel (now Severstal), Wayne Co., MI (Plant ID: A8640)	None (Control already installed)
	“		Bethlehem (now Mittai) Steel, Porter Co., IN (Plant ID: 00001)	Capital cost: \$12.7 million, Annualized cost: \$1.7 million*
	“		Bethlehem (now Mittai) Steel, Sparrows	“

			Point, MD (Plant ID: 0147)	
	“		LTV (now Mittal), Cleveland, OH	“
	“		LTV (now Mittal), East Chicago, IN	“
	“		National Steel (now U.S. Steel), Granite City, IL (Plant ID: 119813AAI)	“
	“	Apply control to half of emissions at Gary, IN plant	U.S. Steel, Gary, IN (Plant ID: 00121)	“
			Republic Technologies, Lorain, OH	“
	“		WCI Steel, Warren, OH (Plant ID: 0278000463)	“
	“		Weirton Steel, Hancock Co., WV (Plant ID: 0001)	“
	“		Wheeling- Pittsburgh Steel Mingo Junction, OH (Plant ID: 0641090010)	“
Sinter Cooler	30300817	99%	Assume for all plants in this SCC	\$5,000 per ton PM _{2.5} reduction

* Based on 7% interest rate and 20 year equipment life.

cc: Tim Smith, US EPA/OAQPS/AQPD/GSG

